PD-AAZ-643

Best available copy -- Annex K missing

AGENCY FOR INTERNATIONAL DEVELOPMENT

Washington, D. C. 20523

PROJECT PAPER
AMENDMENT #2
ANNEX O

EGYPT: National Agricultural
Research (263-0152)

August 22, 1988

ANNEX O

# NATIONAL AGRICULTURAL RESEARCH PROJECT

## AMENDMENT 2

## SEED COMPONENT

ANNEX O

# NATIONAL AGRICULTURAL RESEARCH PROJECT

## AMENDMENT 2

## SEED COMPONENT

National Agricultural Research Project (NARP)
Dr Ahmed Momtaz, Director

1987

National Agricultural Research Center
8 Gamaa Street, Dokki, Giza
Cairo, ARAB REPUBLIC OF EGYPT
tel. 720839
telex 20332 FCRI UN

2'

Prepared under the direction of:

Dr. Ahmed Momtaz
Director, National Agri. Research Project
Director-General, Agri. Research Center

Prepared by:

Dr. Abdel S. Gomaa
Mr. Salah A. Wanis
Dr. Salah D. Gaber
Mrs. Georgette S. Ibrahim
Mr. Safwat Y. Zakhari
Central Administration for Seed

Dr. Maddah El-D. Soliman
Agri. Research Center

Ms Maha Omer
Dr. Bill Gregg
Agri. Research Center/Central Adm. for Seed

This cooperative effort also includes the input of many other persons, including those from several ARC Research Institutes, the Statistics Office, and CAS offices.

## CONTENTS

I. THE NEED ..... 1

Why Seed in NARP? ..... 1
Background ..... 2
Agriculture & Seed Supply ..... 4

II. BENEFITS OF IMPROVED SEED ..... 7

III. ADDITIONAL SPECIFIC BENEFITS IDENTIFIED IN EGYPT ..... 10

Increased Production: The Ultimate Goal ..... 11
Reduced Planting Rates Save Seed & Grain ..... 18
Land Saved by Higher Yields ..... 31

IV. CURRENT SEED SUPPLY STATUS ..... 38

Farmer Seed Needs ..... 39
Seed For Farmers Supplied by Organized Programs ..... 48
Sources of Seed Planted by Farmers ..... 49
Seed Quality ..... 51

V. STATUS OF SEED INDUSTRY COMPONENTS ..... 57

Infrastructure ..... 57
Policy ..... 61
Policy Guidance ..... 63
Policy Implementation ..... 64
Promoting Seed Industry Development ..... 64
Seed Law ..... 65
Seed Law Implementation ..... 66
Genetic Resources: Collection & Preservation ..... 67
Seed Research ..... 69
Variety Development ..... 69
Variety Release ..... 73
Breeder Seed & Variety Maintenance ..... 74
Seed Production ..... 77
Planning Seed Production ..... 78
Seed Quality ..... 78
Seed Standards ..... 78
Seed Certification ..... 82
Seed Testing ..... 84
Referee Testing ..... 96
Foundation Seed ..... 97
Cotton Research, Breeder & Foundation Seed ..... 100

Registered Seed....104
Certified Seed....106
Field Production Supervision & Inspection....111
Transport for "Overseeing/Inspecting" Personnel....114
Non-Certified Seed....114
Processing....115
Seed Storage....135
Seed Transport....136
Seed Pricing....136
Marketing....138
Seed Awareness Training & Promotion....138
Distribution....139
Sale of Seed....141
Credit for Farmer Seed-Users....141
Input Supply & Use....144
Credit for Seed Industry....145
Private Sector....145
Sectorial Coordination & Cooperation....148
Personnel....148
Training Personnel....149
Data Management....151

VI. THE NEED FOR DEVELOPMENTAL ASSISTANCE....155

What is Needed?....155
Timeliness....155

VII. IMPROVING SEED SUPPLY--OBJECTIVE....158

VIII. EXPECTED STATUS AFTER IMPROVEMENT....159

Seed Policy....159
Policy Guidance....159
Policy Implementation....160
Seed Industry Development Promotion....160
Seed Industry Organization & Infrastructure....160
Seed Law....161
Seed Law Implementation....161
Genetic Resources Collection & Preservation....161
Seed Research....161
Variety Development....162
Variety Release....162
Seed Production....162
Planning Seed Production....162
Seed Quality....162
Seed Standards....163

5'

Seed Certification ..... 163
Seed Testing ..... 163
Referee Testing ..... 163
Breeder Seed & Variety Maintenance ..... 164
Foundation Seed ..... 164
Data Management ..... 164
Registered Seed ..... 165
Certified Seed ..... 165
Seed Field Supervision & Inspection ..... 165
Transport For "Overseeing" Personnel ..... 165
Non-Certified Seed ..... 165
Processing ..... 166
Storage ..... 167
Transport ..... 167
Pricing ..... 168
Marketing ..... 168
Seed Awareness Training & Promotion ..... 168
Distribution ..... 169
Sale of Seed ..... 169
Credit For Farmer Seed-Users ..... 169
Input Supply & Use ..... 169
Credit For Seed Facilities & Operations ..... 169
Private Sector ..... 170
Quality Control ..... 170
Sectorial Coordination & Cooperation ..... 171
Personnel ..... 171
Personnel Training & Technical Competence ..... 171
Seed Supply Infratructure ..... 172
Seed Supply to Farmers ..... 172

IX. NARP'S IMPROVEMENTS IN SEED TECHNOLOGY DELIVERY ..... 173

Training ..... 173
Commodities ..... 176
Refurbishing Existing Structures ..... 178
Technical Assistance ..... 179
Budget ..... 179
GOE Support ..... 180

X. IMPLEMENTATION PLAN ..... 182

NARP Seed Improvement ..... 182

XI. COMPLETING ESSENTIAL DEVELOPMENT OF SEED SUPPLY ..... 185

Phasing Improvements ..... 185
Phase II--After NARP ..... 185
Phase III ..... 187

## TABLES


| NUMBER | TITLE | PAGE |
|---|---|---|
| 1 | Impact on total national production of general farmer use of truly-improved seed and ARC improved "Production Technology Packages" with no change in area planted | 12 |
| 2 | Planting rates | 18 |
| 3 | Potential field populations of crop plants at present planting rates | 23 |
| 4 | Seed/grain savings by using improved seed which reduce planting rate by 10% | 25 |
| 5 | Land saved to produce the same crop quantities at higher yields from improved seed & ARC improved technology packages | 31 |
| 6 | Total 1985 seed requirements of Egyptian farmers | 40 |
| 7 | Seed requirements by Governorate | 46 |
| 8 | Seed supplied by organized seed programs in.1985 | 48 |
| 9 | Sources of seed used by farmers | 49 |
| 10 | Wheat seed quality at different distribution levels in selected Governorates | 53 |
| 11 | Field & horticultural crops for which ARC maintains research programs which develop improved varieties | 71 |
| 12 | Crop varieties maintained by ARC in Breeder seed form | 75 |
| 13 | Quality standards for seed of field crops & vegetables | 79 |
| 14 | Crops whose seed are certified | 83 |
| 15 | Seed testing by the Giza Laboratory | 85 |

16 Seed testing by the Tanta Laboratory....86

17 Seed testing by the Minia Laboratory....87

18 Amounts & percentages of seed which are tested for germination....89

19 Amount of farmer-planted seed represented by each sample tested for germination....91

20 Testing labs needed....93

21 Number of trained plurity & germination analysts needed by Governorate seed labs....95

22 Seed sample quality & acceptance operations of CAS Revision Section....96

23 State Farm production of Foundation seed....98

24 State Farm production of Registered seed....105

25 CAS Certified seed production....107

26 Premiums paid by CAS to farmer contract seed growers....109

27 Average % loss during seed processing....110

28 CAS seed production supervision....113

29 Seed processed and seed planted by farmers....117

30 "Design" and actual processing capacities....120

31 Locations of existing processing plants by Governorate....123

32 Seed processing resources and needs of Governorates for field crop seed only....126

33 Processing plant operations....127

34 Seed prices for field crops & vegetables....137

35 PBDAC seed distribution outlets & seed sales....140

36 Planting rates alloted in government credit & crop production packages ..... 143

37 Current estimated potential for government or private sector seed supply for commonly-grown crops ..... 147

38 Training plan ..... 176

## FIGURES


| NUMBER | TITLE | BEHIND PAGE NUMBER |
|---|---|---|
| 1 | Operating & intended Egyptian seed supply infrastructure | 57 |
| 2 | Seed policy determination and implementation | 159 |
| 3 | Forming and implementing realistic policy on seed supply development | 160 |
| 4 | One option for function-oriented organization of seed supply operations | 160 |
| 5 | Collection, maintenance & supply of genetic materials | 161 |
| 6 | Organization to maintain genetic resources | 161 |
| 7 | Activities required to implement the Seed Law | 161 |
| 8 | Procedure for systematic review and release of new varieties | 162 |
| 9 | Sequence of releasing a new variety | 162 |
| 10 | Steps in regular review of varieties and dropping obsolete varieties | 162 |
| 11 | Operations in putting in place an effective seed Certification system | 163 |
| 12 | Foundation seed operations | 164 |
| 13 | Renewal & refurbishing of Sakha pilot research cotton facility | 164 |
| 14 | Establishing effective, realistic seed processing facilities where they can be most useful | 166 |
| 15 | Management sequence in seed processing | 166 |

16 Establishing an effective system for storing seed efficiently, without loss ..... 167

17 Actions by government to promote seed supply development ..... 170

18 Goverment support services required to maintain an effective bi-sectorial seed supply ..... 171

19 Seed supply operations which can be carried out cooperatively and non-competitively by government and the private sector. Government usually supplies seed of crops & varieties not supplied by the private sector ..... 172

20 NARP seed component minimal improvement of existing infrastructure ..... 181

## ACRONYMS USED

ARC--Agricultural Research Center
CAS--Central Administration for Seed, MOA
CERT--Certified seed
COML--Commercial or non-Certified seed
CRI--Cotton Research Institute, ARC
EAA--Egyptian Agricultural Authority
EGCA--Egyptian General Agricultural Cooperatives
FCRI--Field Crops Research Institute, ARC
FDTN--Foundation seed
GOE--Government of the Arab Republic of Egypt
HCRI--Horticultural Crops Research Institute, ARC
IBPGR--International Board for the Protection of Genetic Resources
MOA--Ministry of Agriculture & Land Reclamation
NARP--National Agricultural Research Project
PBDAC--Principal Bank for Development & Agri. Cooperatives
PLS--Pure Live Seed (% germination x % purity / 100)
REG--Registered seed
SCRI--Sugar Crops Research Institute, ARC
USAID--U.S. Agency for International Development (USAID/Cairo)

# SEED

## NATIONAL AGRICULTURAL RESEARCH PROJECT

HIGHER-YIELDING SEED:

-- A CRITICAL RESEARCH AREA
-- A PRIMARY TECHNOLOGY-TRANSFER SYSTEM
-- THE BASIC CROP-IMPROVING PRODUCTION INPUT

# NATIONAL AGRICULTURAL RESEARCH PROJECT
# AMENDMENT 2, SEED

HIGHER-YIELDING SEED:

-- A CRITICAL RESEARCH AREA
-- A PRIMARY TECHNOLOGY-TRANSFER SYSTEM
-- THE BASIC CROP-IMPROVING PRODUCTION INPUT

---

## I

## THE NEED

### WHY SEED IN NARP?

Ability to deliver to farmers the improved seed which transfer new technology is critical to the success of NARP:

1. Research has no value to national agriculture, and does not generate progress and economic development, unless it is taken to the majority of farmers in a form they can use.

2. Improved seed is the only way to transfer improved genetic developments to farmers; some other technologies also depend on improved seed for transfer to farmers.

3. Seed is understood by farmers and regularly used by them, even though they usually do not understand the quality factors which make high yields a part of the benefits carried in seed.

4. NARP is not complete, not will it be effective and serve national agricultural development, unless and until it includes a technology-transfer system which can deliver improved seed to a major portion of Egyptian farmers.

5. NARP presently includes a system for on-farm demonstrations to promote new technologies among farmers; however, NARP still suffers from a deficiency common in agricultural research programs--even after farmers accept technology improvement that they see in demonstrations, they cannot get it or use it until improved seed is readily available.

6. Improved seed offers a 2nd major benefit to transfer of technology--even though seed supply requires high technology, no change in farmer technology is required; simply substitute improved seed in place of the

farmer's low-yielding seed. Once farmers see the benefits of good seed, they are more willing to accept other technological changes. Good seed is universally recognized as the FIRST improved technology to introduce/ transfer in order to increase agricultural efficiency.

A balanced, efficient seed supply requires cooperation and participation by both government and the private sector. ARC has a critical role to play in supplying higher-yielding seed, and this aspect must be included in NARP to ensure that its other activities contribute to national development as planned.

**BACKGROUND**

Structured Egyptian agriculture existed as far back as some 10,000 years ago, supporting the ancient civilizations which flourished around desert wells and along the Nile River. Even in these early periods, crop production depended on seed; seed are not only needed to plant crops, but are also critical to improving crop yield and quality. Crops have been improved and introduced in Egypt for centuries.

Manually-shaken sieves were used to "process" or clean seed, and locally-useful seed storage methods were developed: from harvest to planting, seed were stored in baskets under various ambient conditions; and, as early as 3200 B.C., silos were used in Egypt to store seed mixed with fine ashes to prevent insect attack.

Throughout history, seed was supplied by specialized seed farmers/seed programs and farmers saving seed from part of their crop, in much the same concept as today's "farm-gate" seed and organized seed supply through seed programs which use contract seed growers and seed farms.

As time passed, diseases and other pests attacked crops, commercial and food/grain needs constantly changed, and the ability to satisfy changing needs for improved crops and seed became even more important to both the nation and its farmers.

As civilizations changed and populations grew, methods and infrastructures for supplying seed changed, as did the quality and kinds supplied and needed. In other countries, especially those now called "the developed countries", passing time and changing conditions resulted in seed science and technology changing rapidly in response to changing needs, changing economic conditions, and changing knowledge/technology/ equipment/applied science/management systems.

The beginning of the present-day Egyptian seed program is traced to 1922, when a Seed Production and Distribution Unit was organized for

-16-

cottonseed in the Ministry of Agriculture. It later took on other crop seed, and in 1942 became a "Branch"; it was upgraded to a "Section" in 1957, became a "Directorate" in 1960, and in 1980 became the present-day "Central Administration for Seed" in the Ministry of Agriculture and Land Reclamation.

However, in Egypt the supply and quality of, and infrastructure for, improved seed did not keep pace with changes and needs in agriculture and the economy it supported. For several decades the Egyptian seed supply industry has been neglected in terms of investment funds, technical/ management training for personnel, function-oriented organization, and integration into overall national development. During this period, changes in the seed supply program have been largely structural; little attention and less effort and funding have been paid to changing--implementing, upgrading--the critical technological, infrastructural, physical, and management systems required to meet changing needs for seed supplies, seed cost, and seed quality.

There is an extensive seed program, with many dedicated and motivated persons, which supplies large amounts of seed; however, it lags seriously behind in technology, with the result that:

A. Seed supplied are not truly of high quality, so Egyptian research is not transferred to farmers effectively, thereby wasting a significant portion of the funds invested in research and the education and lifetimes invested by research scientists and specialists.

B. Because seed quality is lower, crop yields are lower than they should be, which results in lower farm family income and reduced national production and supply of food, feed and fiber crops.

C. Facilities of the Egyptian seed program--seed testing laboratories, processing plants, storage facilities, transport/distribution systems and facilities, quality control and assurance systems, technological competence of staff, etc.--are inadequate, outmoded, technologically incomplete, and economically inefficient.

D. Seed cost is excessively high in terms of labor, staff,and time, even though it is lower in quality and does not carry the needed yield-increasing ability.

A significant percentage of Egyptian farmers today do not receive and use truly higher-yielding, high-quality seed that would enable them to get higher yields to increase farm family income and reduce national food deficit.

17

## AGRICULTURE & SEED SUPPLY

Egypt is at a critical phase of economic and agricultural development. Population has grown rapidly over the last 3 decades; rural-to-urban migration has been consistently high; and per-capita income has increased. These, combined with government policies to keep consumer food prices low, caused rapid increases in demand and consumption of agricultural products. For the past 35 years, Egypt sustained increases in crop yields averaging 1.85%/year for wheat, 1.34%/year for rice, and 2.26%/year for maize. Maize yields increased substantially because irrigation water from the Aswan Dam became available and corn production shifted from the Nili to the summer season. Wheat yields increased in the early 1970's due to introduction of Mexican red varieties (Winrock/ USAID). However, such yield increases will be very difficult to continue under today's conditions; to do so will require major changes in the level of technology used by farmers and general application of improved yield-increasing technologies, beginning with general use of improved seed which carry improved genetic developments.

Population is growing at the high rate of 2.7 % annually; every 10 months, a million more persons are added to the population. Egypt already imports approximately 50% of its food, totalling some 3.8 billion U.S. dollars in 1986/87, and including 60% of wheat, 40% of sugar, 42% of fish, 39% of red meat, and all yellow corn requirements.

No more productive agricultural lands are available; furthermore, estimates are that 40,000-50,000 feddans/year are taken out of agriculture for buildings, roads and streets. To help preserve existing lands, government is trying to restrict use of fertile alluvial soils for brick-making. Improvement and maintenance of irrigation systems is a regular program to help increase year-round use of crop lands. The Aswan High Dam not only provided more irrigation water, but also helped by preventing floods in downstream croplands. To bring potential new lands into production, the government initiated the land reclamation program. However, this can only add a relatively small part of the land needed--at present productivity levels--to produce the required increases in food/feed/fiber, and such land reclamation and production is often costly. 96-97% of present crop production now comes from old land; only 3-4% comes from new and old reclaimed land.

Ninety-five percent of the farm holdings average 5.0 feddan or less. Agriculture provides 40% of the nation's employment and contributes 20% of the GNP, while agricultural programs receive only 9% of government funds. Unless industry and service can expand their need for labor much more rapidly than in the past, they cannot absorb the increasing work force arising from population increase. Thus, agriculture must absorb an increasing number of workers, which will further reduce average farm size,

18

and will increase the number of farm workers directly dependent upon less land for their livelihood.

Agricultural output is rising less rapidly than demand for these commodities, but Egypt has the potential to eliminate its food deficit by increasing agricultural production through proper use of improved seed and inputs, and appropriate intensive agricultural practices (USAID Irrigation Briefing Paper).

Under existing and apparently change-resisting economic/social conditions, only one feasible solution to the need for more food is available: increase per-feddan crop yields through:

1. More intensive use of existing crop lands, through more crops grown per year.

   This will require intensified research to develop shorter-season varieties; cropping systems that fit local conditions and provide the desired intensified land use; improved crop storage/marketing/pricing to make it profitable for farmers to use the new systems; and intensified technology transfer through farmer education and extension promotion.

2. Increase yields to produce more per feddan/crop, through intensified production, supply, distribution, and general farmer use of improved inputs which can increase crop yields per-feddan.

   Foremost is high-quality seed, which is the primary improved input to improve crop production. Improved seed is generally recognized as the first and most important input to introduce in a developing agriculture, and as a continuing need of developed agricultures.

Because of urgent national needs for certain food crops to support growing urban populations and ensure availability of basic food needs and export crops, government designated some crops as controlled. While this made more production available, it required that government subsidize these crops in order to induce farmers to grow them. This interfered with the market-controlled pricing structure, and in some cases resulted in significant pricing differences which affect farmer choices and continue the necessity for subsidies. Some are subsidized at levels well above world market prices, making it more expensive to produce them than to import them. At the same time, development has stagnated in the seed industry which should supply improved seed as the primary crop production input which could increase yields.

"Since improved seed are the essential delivery system for new technology, attention should be focused on the seed supply industry. There

are problems within the industry; for example, during the past 6 years, seed production area expanded dramatically for wheat and rice, but there was little if any increase in seed supply. This partly reflects difficulties with establishing a workable system for seed contract prices during a period of inflation; reduced wheat seed production in 1984 reflected high rejection rates as CAS demanded closer adherence to quality standards".

"There are concerns about maintaining seed quality; about being able to produce adequate amounts; and about how to deal with cropping emergencies such as the recent rice blast disease outbreak. The over-riding concern is seed quality (germination, varietal purity, freedom from weed seed and foreign material); seed quality will remain a problem unless adequate field inspection/supervision is achieved".

"Deficiencies in the seed production and supply system have been identified as constraints to Egypt's crop production and agricultural development. Key officials and experts repeatedly identify the seed industry as a critical bottleneck in transferring the benefits of new agricultural technology to farmers" (Winrock/USAID).

# II

## BENEFITS OF IMPROVED SEED

Experienced agricultural development specialists recognize, and are backed up by considerable data, that general farmer use of improved seed is a critical first step in improving productivity, for many reasons:

A. Improved seed is the easiest improved technology to introduce to farmers: it requires no change in farmer technology--simply substitute higher-yielding seed for the farmer's previous low-yielding seed.

B. Once farmers see the benefits of using improved seed, they are more willing to adopt other improved inputs such as crop rotation and pesticides. Transfer of technology from research to farmers is faster and more complete.

C. Truly-pure seed is the only means of transferring genetic research/ technology developments to farmers. Only improved, pure seed can take to farmers the genetic materials which increase yield, improve adaptation to local environments, resist disease and insect attacks, improve crop qualities to meet consumer needs and improve living standards, shorten crop growing seasons so more crops can be grown each year, increase nutritive value and consumer appeal of crops, etc. Data from many countries show that use of improved seed generally increases yields by 15-20%; in some cases, yield increases are much higher, and where serious crop diseases occur, improved seed may mean the difference between a good crop or no crop.

D. If he plants genetically-pure seed, the farmer not only gains yield benefits but also produces more uniform crops of higher, uncontaminated quality which usually bring better prices on the market. This also increases food availability through better crop quality; for example, rice varieties with a higher milling percentage can greatly reduce losses due to breakage during milling.

E. Improved physical purity of seed permits the farmer to plant less, because his planting material contains less trash. He also can avoid planting seed of weeds which increase field competition to his crops and thus reduce yields; he also does not plant seed of other crops which competitively reduce yield of his intended crop, contaminate his product, and reduce its value.

F. Improved germination and seedling vigor give the farmer a better

21'

field stand of crop plants, at considerably reduced planting rates. He can also change his technology and "plant to a stand", thereby avoiding costly--in labor and yields--replanting, thinning, and excessive plant population.

G. Young crop plants from high-germinating, high-vigor seed grow more vigorously, and are better able to withstand early attack by disease/insect complexes; this reduces crop losses and use of pesticides.

H. Vigorous early growth enables crop plants to get a headstart and smother weeds, thereby reducing weed competition, increasing yields, and reducing the need for manual, chemical or mechanical weed control.

I. General use of higher-quality seed which reduce planting rates can save grain which would otherwise be used for seed. Not only does the farmer save money on seed and planting operations, but the nation also gains; e.g., planting 5 kg less seed/feddan on the wheat crop of some 1,100,000 feddans (easily possible through improved seed) would divert 5,500 tons of wheat from seed use into grain/food use, thereby reducing imports and cropland used for wheat, and freeing some land for other crops.

J. General use of improved higher-yielding seed produces the required food/grain/fiber on less land; nationally, this means that less land is needed, so more crop land is available to produce other crops.

K. Production of more food/grain/fiber on less land through general use of higher-yielding seed reduces government expenditures of foreign currency to import food to meet domestic requirements.

L. General use of improved seed which provide genetically-available resistance to diseases and insects reduces the need for pesticides, reduces crop production costs, reduces environmental contamination, and reduces contamination of foodstuffs.

M. Supplying truly-improved seed, especially under conditions of low agricultural technology, requires a high-technology seed supply industry. This requires investment in trained personnel, fixed and operating costs, but at the same time it generates new employment opportunities in crop-growing or rural areas, which helps agro-industrial development in non-urban areas.

N. Most seed is produced by farmers contracted by seed programs (both government and private sector); intensive guidance and supervision

from the seed program intensifies technology transfer to farmers who produce seed, and also increases farm family income.

O. As the seed industry develops its ability to produce and supply domestic farmer needs for improved seed, it can use its existing infrastructure to produce seed for export. Especially under Egypt's climatic conditions and low labor costs, there is great potential for producing labor-intensive specialty seed (vegetable and flowers, especially hybrids) for export. This not only creates domestic rural employment and earns foreign exchange for the country, but also is a means of exporting village labor without the problems associated with workers going abroad. (NOTE: just as domestic rural development requires truly improved seed, so an export seed market requires truly high-quality seed in all cases).

P. Properly processed, high-germinating seed are required before farm mechanization (planting, cultivation, harvest) can be implemented effectively.

Q. Improved seed reduce or prevent the losses caused by diseases which attack crop seedlings and mature plants. Improved seed are treated to prevent seedling disease damage and to help control some diseases which affect mature plants. The genetic resistance carried by improved seed is also a major factor in preventing crop losses to disease; for example, susceptible corn can be completely destroyed by downy mildew, while a genetically-resistant variety can produce a high yield.

R. Insect pest problems are reduced. Improved seed are generally treated with an insecticide which reduces insect damage in stored seed (i.e., seed waiting to be planted), and can be treated with materials to reduce damage by soil insects after the seed are planted.

# III

## ADDITIONAL SPECIFIC BENEFITS IDENTIFIED IN EGYPT

Adequate supply and general use of improved, higher-yielding seed by farmers could have significant impacts on agriculture, land usage, farm income, and crop imports. In addition to the classic benefits, data show that improved seed can provide specific benefits:

1. Analyses made for NARP indicate that crop yields could be increased as much as 30-80% by use of "production packages" which include improved seed of higher-yielding varieties developed by ARC.

2. Studies by ARC and CAS showed that production of berseem clover forage can be increased 40% and 2 additional cuttings made possible simply by processing seed (most clover seed is not properly processed, due to lack of processing facilities; EMCIP introduced one very small roll mill for cleaning clover seed). Clover forage yield can be increased by seed processing because (1) foreign material is removed, enabling farmers to plant purer seed and get better, more uniform stands; (2) germination is improved, so less seed is required, and better stands are obtained; (3) seedling vigor is improved, seedlings grow off faster and smother weeds, so weed competition does not reduce clover yields; (5) weed seed are removed, so farmers do not plant harmful weeds which reduce forage yields (dodder, a yield- reducing parasitic weed, is a major pest) (CAS).

3. If all clover seed were processed, the resulting increase in forage yield could release more than 500,000 feddans of cropland to produce wheat.

4. In addition to the usual yield benefits from using improved maize seed as compared to unimproved seed, modern hybrids give an additional yield benefit: in Egypt, hybrids have shown a 30% yield increase over improved open-pollinated varieties.

The following subsections and tables show other specific benefits in Egypt of using improved seed.

## INCREASED PRODUCTION: THE ULTIMATE GOAL

The purpose of crop research and the improved seed which take research to farmers is to increase crop yields, national food supply, and rural family ncomes. Research has no value to the nation unless its results are delivered to farmers in a form which they can use.

The yield-increasing value of crop research and improved seed has been proven beyond question, time and time again, in every agricultural context.

Present conditions of farmer knowledge, seed quality, and seed supply prevent all farmers from using presently-available levels of technology in improved seed and production practices. However, these have been shown to increase yields 30-80% above present average farmer yields (USAID; NARP document). This is a conservative possible-to-achieve figure, much lower than improvements shown by research data in other countries; for example, existing practically-applicable improved seed and production technologies for rice in Thailand show that yields can be increased 600% above present average farmer yield.

What is the potential benefit to the entire nation, if all farmers use improved seed and improved production technology packages (including improved seed) as developed by ARC? Using the conservative midpoint of 50%, halfway between the 30% and 80% yields increases over average farmer yields found for different crops/locations, the potential increases in crop production are summarized in Table 1.

Table 1 is, of course, a generalization; in some crops and some farmers' fields, yield increase will not be this high; on the other hand, in many crops and fields, yield increase will be higher. Table 1 does give an indication of the potential benefits to the food supply situation if all farmers receive truly-improved seed and can use present improved production practices.

TABLE 1
IMPACT ON TOTAL NATIONAL PRODUCTION OF GENERAL FARMER USE OF TRULY-IMPROVED SEED & ARC IMPROVED PRODUCTION TECHNOLOGY PACKAGES WITH NO CHANGE IN AREA PLANTED
(calculated from ARC & CAS data, 1987; based on 1985 crops; some differences occur due to rounding figures)

| CROP | FEDDANS HARVESTED | YIELDS UNDER PRODUCTION METHOD | | | | TOTAL GAIN IN YIELD (mt) |
|---|---|---|---|---|---|---|
| | | PRESENT FARMER | | IMPROVED | | |
| | | AVE. (mt/f) | TOTAL (mt) | AVE. (kg/f) | TOTAL (mt) | |
| Artichoke: | 4963 | --- | 40,691 | --- | 61,043 | 20,352 |
| Nili | (3,458) | 8.22 | (28,425) | 12.33 | (42,637) | (14,212) |
| Winter | (1,505) | 8.15 | (12,266) | 12.23 | (18,406) | (6,140) |
| Barley: | | | | | | |
| Irrigated | 124,599 | 1.17 | 145,781 | 1.71 | 219,294 | 73,513 |
| Dryland | | 0.70 | | | | |
| Bean, broad (vegetable): | | | | | | |
| Winter | 790 | 4.69 | 3,705 | 7.04 | 5,562 | 1,857 |
| Bean, broad (for beans) | 284,712 | 1.00 | 284,712 | 1.50 | 427,068 | 142,356 |
| Bean, green | 43,966 | 4.69 | 206,201 | 7.04 | 309,521 | 103,320 |
| Bean, green: | 28,497 | 3.98 | 113,419 | 5.97 | 170,127 | 56,708 |
| Nili | (7,955) | 3.96 | (31,502) | 5.94 | (47,253) | (15,751) |
| Summer | (12,259) | 4.53 | (55,533) | 6.80 | (83,361) | (27,828) |
| Winter | (8,283) | 3.19 | (26,423) | 4.79 | (39,676) | (13,253) |
| Bean, dried: | 11,244 | 0.91 | 10,232 | 1.37 | 15,377 | 5,145 |
| Nili | (4,636) | 0.76 | (3,523) | 1.14 | (5,285) | (1,762) |
| Summer | (5,878) | 1.01 | (5,937) | 1.52 | (8,935) | (2,998) |
| Winter | (710) | 1.25 | (888) | 1.88 | (1,335) | (447) |

| CROP | FEDDANS HARVESTED | YIELDS UNDER PRODUCTION METHOD | | | | TOTAL GAIN IN YIELD (mt) |
|---|---|---|---|---|---|---|
| | | PRESENT FARMER | | IMPROVED | | |
| | | AVE. (mt/f) | TOTAL (mt) | AVE. (kg/f) | TOTAL (mt) | |
| Cabbage: | 36,577 | 10.71 | 391,740 | 16.07 | 587,792 | 196,052 |
| Nili | (12,130) | 10.23 | (124,090) | 15.35 | (186,196) | (62,106) |
| Summer | (2,271) | 8.45 | (19,190) | 12.68 | (28,796) | (9,606) |
| Winter | (22,176) | 11.33 | (251,254) | 17.00 | (376,992) | (125,738) |
| Carrot: | 12,369 | 10.76 | 133,090 | 16.14 | 199,636 | 66,546 |
| Nili | (2,597) | 11.12 | (28,879) | 16.68 | (43,318) | (14,439) |
| Summer | (1,510) | 13.21 | (19,947) | 19.82 | (29,928) | (9,981) |
| Winter | (8,262) | 10.20 | (84,272) | 15.30 | (126,409) | (42,137) |
| Cauliflower: | 9,520 | 9.72 | 92,534 | 14.58 | 138,802 | 46,268 |
| Nili | (2,137) | 8.92 | (19,062) | 13.38 | (28,593) | (9,531) |
| Summer | (292) | 10.81 | (3,157) | 16.22 | (4,736) | (1,579) |
| Winter | (7,091) | 9.91 | (70,272) | 14.87 | (105,443) | (35,171) |
| Chickpea | 18,890 | 0.61 | 11,523 | 0.92 | 17,379 | 5,836 |
| Clover, berseem: | 2,806,967 | --- | 5,777,090 | --- | 8,692,381 | 2,915,291 |
| Full-season | (1,971,967) | 1.802 | (5,058,155) | 2.71 | (7,606,881) | (2,548,726) |
| Short-season | (835,000) | 0.861 | (718,935) | 1.30 | (1,085,500) | (366,565) |
| Colocasia: | 7,509 | 12.49 | 93,787 | 18.74 | 140,719 | 46,932 |
| Nili | (29) | 8.84 | (256) | 13.26 | (385) | (129) |
| Summer | (7,412) | 12.53 | (92,872) | 18.80 | (139,346) | (46,474) |
| Winter | (68) | 9.11 | (619) | 13.67 | (930) | (311) |
| Cotton | 1,081,009 | 1.07 | 1,156,680 | 1.61 | 1,740,424 | 583,744 |
| Cowpea, green: | 3,110 | 3.76 | 11,694 | 5.64 | 23,180 | 11,486 |
| Nili | (1,615) | 3.86 | (6,234) | 5.79 | (9,351) | (3,117) |
| Summer | (2,479) | 3.70 | (9,172) | 5.55 | (13,758) | (4,586) |
| Winter | (16) | 3.69 | (59) | 5.54 | (87) | (28) |

| CROP | FEDDANS HARVESTED | YIELDS UNDER PRODUCTION METHOD PRESENT FARMER AVE. (mt/f) | TOTAL (mt) | IMPROVED AVE. (kg/f) | TOTAL (mt) | TOTAL GAIN IN YIELD (mt) |
|---|---|---|---|---|---|---|
| Cowpea, dried: | 7,560 | 1.07 | 8,089 | 1.61 | 12,172 | 4,083 |
| Summer | (4,921) | 1.18 | (5,807) | 1.77 | (8,710) | (2,903) |
| Nili | (2,639) | 0.87 | (2,296) | 1.31 | (3,457) | (1,161) |
| Cucumber: | 42,215 | 7.29 | 307,747 | 10.94 | 461,832 | 154,085 |
| Nili | (6,952) | 5.73 | (39,835) | 8.60 | (59,787) | 1(9,952) |
| Summer | (33,930) | 7.77 | (263,636) | 11.66 | (395,624) | (131,988) |
| Winter | (1,333) | 2.28 | (3,039) | 3.42 | (4,559) | (1,520) |
| Eggplant: | 35,089 | 9.22 | 323,521 | 13.83 | 485,281 | 161,760 |
| Nili | (6,631) | 9.25 | (61,337) | 13.88 | (92,038) | (30,701) |
| Summer | (19,583) | 9.76 | (191,130) | 14.64 | (286,695) | (95,565) |
| Winter | (8,873) | 7.98 | (70,807) | 11.97 | (106,210) | (35,403) |
| Fenugreek | 31,670 | 0.80 | 25,336 | 1.20 | 38,004 | 12,668 |
| Flaxseed | 32,000 | 0.51 | 16,320 | 0.77 | 24,640 | 8,320 |
| Garlic | 15,000 | 8.05 | 120,750 | 12.08 | 181,200 | 60,450 |
| Jute, Malta: | 11,396 | 1.0 | 11,396 | 1.5 | 17,094 | 5,698 |
| Nili | (4,778) | | (4,778) | | (7,167) | (2,389) |
| Summer | (6,261) | | (6,261) | | (9,392) | (3,131) |
| Winter | (357) | | (357) | | (536) | (179) |
| Lentil | 18,000 | 0.59 | 10,620 | 0.89 | 16,020 | 5,400 |
| Lettuce: | 13,242 | 8.69 | 115 073 | 13.04 | 172,676 | 57,603 |
| Nili | (301) | 8.68 | (2,613) | 13.02 | (3,919) | (1,306) |
| Summer | (1,916) | 8.36 | (16,018) | 12.54 | (24,027) | (8,009) |
| Winter | (11,025) | 8.74 | (96,359) | 13.11 | (144,538) | (48,179) |
| Lupines | 10,000 | 0.71 | 7,100 | 1.07 | 10,700 | 3,600 |

| CROP | FEDDANS HARVESTED | YIELDS UNDER PRODUCTION METHOD PRESENT FARMER AVE. (mt/f) | TOTAL (mt) | IMPROVED AVE. (kg/f) | TOTAL (mt) | TOTAL GAIN IN YIELD (mt) |
|---|---|---|---|---|---|---|
| Maize: | 1,974,967 | --- | 3,689,654 | --- | 5,537,109 | 1,847,455 |
| Nili | (525,930) | 1.45 | (762,599) | 2.18 | (1,146,527) | (383,928) |
| Summer | (1,449,037) | 2.02 | (2,927,055) | 3.03 | (4,390,582) | (1,463,527) |
| Mallow, Egyptian: | 1,416 | 16.07 | 22,755 | 24.11 | 34,140 | 11,385 |
| Nili | (3) | 8.00 | (24) | 12.00 | (36) | (12) |
| Winter | (1,413) | 16.08 | (22,721) | 24.12 | (34,082) | (11,361) |
| Mallow, Jews: | 15,009 | 7.24 | 108,665 | 10.86 | 162,998 | 54,333 |
| Nili | (6,895) | 5.37 | (37,026) | 8.06 | (55,574) | (18,548) |
| Summer | (7,487) | 8.87 | (66,410) | 13.31 | (99,652) | (33,242) |
| Winter | (827) | 834 | (6,897) | 12.51 | (10,346) | (3,449) |
| Melon & cantaloupe: | 28,315 | 9.07 | 256,817 | 13.61 | 385,367 | 128,550 |
| Nili | (83) | | (753) | | (1,130) | (377) |
| Summer | (26,216) | | (237,779) | | (356,800) | (119,021) |
| Winter | (2,016) | | (18,285) | | (27,438) | (9,153) |
| Okra: | 10,065 | 5.68 | 57,169 | 8.52 | 85,754 | 28,585 |
| Nili | (432) | 4.78 | (2,065) | 7.17 | (3,097) | (1,032) |
| Summer | (9,615) | 5.73 | (55,094) | 8.60 | (82,689) | (27,595) |
| Winter | (8) | 1.88 | (15) | 2.82 | (23) | (8) |
| Onion, summer: | 64,483 | | 269,701 | | 404,609 | 134,908 |
| Sole crop | (11,491) | 7.33 | (84,229) | 11.00 | (126,401) | (42,172) |
| Intercrop | (52,992) | 3.50 | (185,472) | 5.25 | (278,208) | (92,736) |
| Onion, winter: | 65,308 | | 435,177 | | 652,875 | 217,698 |
| Sole crop | (21,772) | 8.67 | (188,763) | 13.01 | (283,254) | (94,491) |
| Intercrop | (43,536) | 5.66 | (246,414) | 8.49 | (369,621) | (123,207) |

| CROP | FEDDANS HARVESTED | YIELDS UNDER PRODUCTION METHOD PRESENT FARMER AVE. (mt/f) | PRESENT FARMER TOTAL (mt) | IMPROVED AVE. (kg/f) | IMPROVED TOTAL (mt) | TOTAL GAIN IN YIELD (mt) |
|---|---|---|---|---|---|---|
| Onion, winter green: | 13,381 | | 85,129 | | 127,718 | 42,589 |
| Sole crop | (4,487) | 5.27 | (23,646) | 7.91 | (35,492) | (11,846) |
| Intercrop | (331) | 4.66 | (1,542) | 6.99 | (2,314) | (772) |
| Nili | (8,563) | 7.00 | (59,941) | 10.50 | (89,912) | (29,971) |
| Pea, green: | 17,496 | 3.99 | 69,809 | 5.99 | 104,801 | 34,992 |
| Pea, dried: | 7,514 | 0.915 | 6,875 | 1.38 | 10,369 | 3,494 |
| Groundnut | 28,152 | 0.82 | 23,085 | 1.23 | 34,627 | 11,542 |
| Pepper: | 27,947 | 6.86 | 191,716 | 10.29 | 287,575 | 95,859 |
| Nili | (4,766) | 6.55 | (31,217) | 9.83 | (46,850) | (15,633) |
| Summer | (17,567) | 7.35 | (129,117) | 11.03 | (193,764) | (64,647) |
| Winter | (5,614) | 5.85 | (32,842) | 8.78 | (49,291) | (16,449) |
| Potato: | 148,127 | 8.09 | 1,198,347 | 12.14 | 1,798,262 | 599,915 |
| Nili | (86,092) | 8.07 | (694,762) | 12.11 | (1,042,574) | 347,812 |
| Summer | (62,035) | 8.66 | (537,223) | 12.99 | (805,835) | 268,612 |
| Radish: | 3,876 | 5.39 | 20,892 | 8.09 | 31,357 | 10,465 |
| Nili | (900) | 5.11 | (4,599) | 7.67 | (6,903) | (2,304) |
| Summer | (1,259) | 5.52 | (6,950) | 8.28 | (10,425) | (3,475) |
| Winter | (1,717) | 5.44 | (9,340) | 8.16 | (14,011) | (4,671) |
| Rice: | 923,971 | 2.5 | 2,309,928 | 3.75 | 3,464,891 | 1,154,963 |
| Nili | (951) | 1.04 | (989) | 1.56 | (1,484) | (495) |
| Summer | (923,020) | 2.27 | (2,095,255) | 3.41 | (3,147,498) | (1,052,243) |
| Sesame | 26,060 | 0.42 | 10,945 | 0.63 | 16,418 | 5,473 |
| Sorghum: | 330,674 | 1.60 | 529,078 | 2.40 | 793,618 | 264,540 |
| Nili | (9,230) | 1.30 | (11,999) | 1.95 | (17,999) | (6,000) |
| Summer | (365,770) | 1.54 | (563,286) | 2.31 | (844,929) | (281,643) |

| CROP | FEDDANS HARVESTED | YIELDS UNDER PRODUCTION METHOD PRESENT FARMER AVE. (mt/f) | TOTAL (mt) | IMPROVED AVE. (kg/f) | TOTAL (mt) | TOTAL GAIN IN YIELD (mt) |
|---|---|---|---|---|---|---|
| Soybean | 119,048 | 1.17 | 139,286 | 1.76 | 209,524 | 70,238 |
| Spinach: | 6,522 | 6.91 | 45,067 | 10.37 | 67,633 | 22,566 |
| Nili | (201) | 6.08 | (1,222) | 9.12 | (1,833) | (611) |
| Winter | (6,351) | 6.94 | (44,076) | 10.41 | (66,114) | (22,038) |
| Squash: | 59,782 | 7.82 | 467,495 | 11.73 | 701,243 | 233,748 |
| Nili | (13,899) | 7.77 | (107,995) | 11.66 | (162,062) | (54,067) |
| Summer | (26,623) | 8.47 | (225,497) | 12.71 | (338,378) | (112,881) |
| Winter | (19,260) | 6.96 | (134,050) | 10.44 | (201,074) | (67,024) |
| Sugarbeet | 40,622 | 14.24 | 578,457 | 21.36 | 867,686 | 289,229 |
| Tomato: | 340,057 | 10.36 | 3,522,991 | 15.54 | 5,284,486 | 1,761,496 |
| Nili | (92,564) | 11.84 | (1,095,958) | 17.76 | (1,643,937) | (547,979) |
| Summer | (106,563) | 11.09 | (1,181,784) | 16.64 | (1,773,208) | (591,424) |
| Winter | (140,930) | 9.12 | (1,285,282) | 13.68 | (1,927,922) | (642,640) |
| Turnip: | 6,847 | 9.22 | 63,129 | 13.83 | 94,694 | 31,565 |
| Nili | (1,265) | 9.83 | (12,435) | 14.75 | (8,659) | (6,224) |
| Summer | (290) | 9.68 | (2,807) | 14.52 | (4,211) | (1,404) |
| Winter | (4,932) | 9.04 | (44,585) | 13.56 | (66,878) | (22,293) |
| Watermelon | 122,165 | 9.29 | 1,234,913 | 13.94 | 1,702,980 | 468,067 |
| Wheat | 1,185,923 | 1.58 | 1,873,758 | 2.37 | 2,810,638 | 936,880 |

## REDUCED PLANTING RATES SAVE SEED & GRAIN

Crops normally produce better, more economic yields when planted at certain plant populations, which give each plant the space it needs to produce best, but at the same time wastes none of the farmer's field space. Egyptian farmers use high--in some cases excessively high--planting rates (Table 2); when high planting rates are observed, it is a strong indication that (1) farmers do not trust the germinability and purity of the seed they plant; and (2) farmers have not been educated as to crop plant spacing and input use; or (3) fertilizer is so expensive or scarce that farmers plant more seed as a substitute.

TABLE 2
PLANTING RATES
(from ARC & CAS data, 1987)

| CROP | PLANTING RATE (kg/feddan) |
|---|---|
| Artichoke | 4,000 (no. of cuttings) |
| Barley: | |
| Irrigated | 60 |
| Dryland | 80 |
| Bean, broad (vegetable) | 30-50 |
| Bean, broad (for beans) | 75 |
| Bean, green | 75 |
| Bean, green | 30-40 |
| Bean, dried | 30-40 |
| Cabbage | 0.15 |
| Carrot | 2-5 |
| Cauliflower | 0.40 |
| Chickpea | 60 |
| Clover, berseem | 25 |
| Colocasia | 900 (no. of tubers) |
| Cotton | 70 |

| CROP | PLANTING RATE (kg/feddan) |
|---|---|
| Cowpea, green | 40 |
| Cowpea, dried | 40 |
| Cucumber | 1.0-1.5 |
| Eggplant | 0.20-0.30 |
| Fenugreek | 25 |
| Flaxseed | 60 |
| Garlic | 300 (kg bulbs) |
| Jute, Malta | 4-6 |
| Lentil | 80 |
| Lettuce | 0.5 |
| Lupines | 75 |
| Maize | 15 |
| Mallow, Egyptian | 10 |
| Mallow, Jews | 10 |
| Melon & cantaloupe | 1.25 |
| Okra | 6-8 |
| Onion, summer: | |
| Sole crop | 7 |
| Intercrop | 7 |
| Onion, winter: | |
| Sole crop | 7 |
| Intercrop | 7 |
| Onion, winter green: | |
| Sole crop | 7 |
| Intercrop | 7 |
| Pea, green | 40 |
| Pea, dried | 40 |
| Groundnut | 50 |

| CROP | PLANTING RATE (kg/feddan) |
|---|---|
| Pepper | 0.25 |
| Potato: | |
| Nili | 1,500 |
| Summer | 750 |
| Radish | 5-8 |
| Rice | 60 |
| Sesame | 4 |
| Sorghum: | |
| Forage | 15-20 |
| Grain | 6-8 |
| Soybean | 40 |
| Spinach | 8-12 |
| Squash | 1-2 |
| Sugarbeet | 12 |
| Tomato | 0.12-0.36 |
| Turnip | 4 |
| Watermelon | 1.50 |
| Wheat | 75 |

When farmers plant excessive rates, they either (1) plant a lot of foreign material and dead seed which have no planting value; or (2) get excessively high plant populations which then cause extra expenses because the crop must be thinned.

A major technological advantage of dependably-improved seed is that farmers can plant to a stand, avoid thinning and use less seed. The seed saved, in case of grains and food legumes, can then be used as food. This further reduces the land needed for crop production and/or the amount which must be imported.

The extent of excessive planting rates can be shown by calculations on 2 major crops:

1. Wheat:

Seed per gram: 25 (varies with variety)
Seed per kilogram: 25,000
Minimum germination under Law 53 of 1966: 85%
Minimum purity under Law 53 of 1966: 95%
Pure live seed (% germination X % purity / 100): 80.75% PLS
Minimum allowed number of pure live seed per kg: 20,825
Planting rate: 75 kg/feddan
Plants per feddan from 75 kg seed of 80.75% PLS: 1,514,062
Recommended plant population: per feddan: 500,000
per sq. meter*: 119
Kg of 80.75% PLS seed needed per feddan: 24.01
Excess seed being planted by farmers: 51 kg/feddan

2. Rice:

Seed per gram: 66 (varies with variety)
Seed per kilogram: 66,000
Minimum germination under Law 53 of 1966: 85%
Minimum purity under Law 53 of 1966: 95%
Pure live seed (% germination X % purity / 100): 80.75% PLS
Minimum number of pure live seed per kg allowed: 53,295
Planting rate: 60 kg/feddan
Plants per feddan from 60 kg seed of 80.75% PLS: 3,197,700
Recommended plant population: per feddan:120,000
per sq. meter*: 29
Kg of 80.75% PLS seed needed per feddan: 2.26
Excess seed being planted by farmers: 57.7 kg/feddan

* calculated from 1 feddan = 4,200.83 sq. m.

In all crops, planting rates are excessive, but the amount in excess varies. As a very conservative figure, 10% of all seed could be saved by using higher-quality seed. The amount saved could be used for food/feed, or could reduce the use of land to produce seed.

Crops produce their best at certain plant populations The plant population in a field is determined by (1) quality (germination and purity) of the seed planted; (2) amount of seed planted; and (3) suitability of environmental conditions for germination and seedling emergence. Assuming that farmers plant at the correct time of the correct season and

provide good field conditions (water, land preparation, weed and pest control, etc.), seed quality and planting rate are critical determinants of crop stand and yield. Table 3 shows the potential field plant populations, at presently-used planting rates, of various crops. These illustrate the excess planting rates now used, when compared with plant populations recommended by ARC.

TABLE 3
POTENTIAL FIELD POPULATIONS OF CROP PLANTS AT PRESENT PLANTING RATES
(calculated from ARC & CAS data, 1987)*

| CROP | PLANTING RATE (kg/feddan) | LAW 53 MINIMUM % PLS** | NO. SEED PER KG | POTENTIAL NO. PLANTS PER FEDDAN | RECOMMENDED PLANT POPULATION |
|---|---|---|---|---|---|
| Barley | 60 | 79.05 | 30,000 | 1,422,900 | Thick stand |
| Bean, broad | 50 | 79.05 | | | 140,000 |
| Bean, green | 75 | 66.50 | 4,000 | 199,500 | 70,000 |
| Bean, dried | 40 | 79.05 | 4,000 | 126,480 | 70,000 |
| Beet, garden | | 45.00 | 58,000 | | |
| Cabbage | 0.15 | 65.10 | 315,000 | 30,760 | 12,000 |
| Carrot | 5 | 42.50 | 826,000 | 1,755,250 | |
| Cauliflower | 0.40 | 55.80 | 315,000 | 70,308 | 9,000 |
| Chickpea | 60 | 76.50 | 2,000 | 91,800 | 140,000 |
| Clover, berseem | 25 | 76.50 | 456,000 | 8,721,000 | Thick stand |
| Cotton | 70 | 70*** | 8,000 | 392,000 | 70,000 |
| Cowpea | 40 | 65.10 | 8,000 | 208,320 | 35,000 |
| Cucumber | 1.50 | 55.20 | 38,000 | 31,464 | 14,000 |
| Eggplant | 0.30 | 57.00 | 228,000 | 38,988 | 10,000 |
| Fenugreek | 25 | 76.50 | | | 1,680,000 |
| Flaxseed | 60 | 72.00 | 178,000 | 7,689,600 | 6,000,000 |
| Hena | | | | | |
| Jute, Malta | 6 | 51.00 | | | |
| Lentil | 80 | 76.50 | | | 1,680,000 |
| Lettuce | 0.5 | 54.00 | 888,000 | 239,760 | |
| Lupines | 75 | 76.50 | 7,000 | 401,625 | 140,000 |
| Maize | 15 | 80.75 | 2,500 | 30,281 | 20,000 |
| Mallow, Egyptian | 10 | 48.00 | | | |
| Mallow, Jews | 10 | 48.00 | | | |
| Melon & cantaloupe | 1.25 | 55.20 | 45,000 | 31,050 | 5,600 |

| CROP | PLANTING RATE (kg/feddan) | LAW 53 MINIMUM % PLS** | NO. SEED PER KG | POTENTIAL NO. PLANTS PER FEDDAN | RECOMMENDED PLANT POPULATI |
|---|---|---|---|---|---|
| Okra | 8 | 51.00 | 19,000 | 77,520 | 20,000 |
| Onion | 7 | 63.00 | 341,000 | 1,503,810 | 200,000 |
| | | | | | 20,000**** |
| Pea, green | 40 | 66.50 | 3,000 | 79,800 | 60,000 |
| Pea, dried | 40 | 66.50 | 4,000 | 106,400 | 60,000 |
| Groundnut | 50 | 76.50 | 2,000 | 76,500 | 35,000 |
| | | | | | 70,000**** |
| Pepper | 0.25 | 38.00 | 167,000 | 15,865 | 15,000 |
| Radish | 8 | 63.00 | 75,000 | 378,000 | |
| Rice | 60 | 76.50 | 66,000 | 3,029,400 | 120,000 |
| Sesame | 4 | 76.50 | 360,000 | 1,101,600 | 162,000 |
| Sorghum: | | | | | |
| Forage | 20 | 66.50 | 52,000 | 691,600 | 92,000 |
| Grain | 8 | 79.05 | 52,000 | 328,848 | 70,000 |
| Soybean | 40 | 67.50 | 10,000 | 270,000 | 140,000 |
| Spinach | 12 | 42.50 | 100,000 | 510,000 | |
| Squash | 2 | 57.00 | 14,000 | 15,960 | 10,500 |
| Sugarbeet | 12 | 45.00 | 54,000 | 291,600 | 40,000 |
| Tomato | 0.36 | | 405,000 | | 12,000 |
| | | | | | 35,000**** |
| Turnip | 4 | | 536,000 | | |
| Watermelon | 1.50 | 57.00 | 11,000 | 9,405 | 2,800 |
| Wheat | 75 | 80.75 | 25,000 | 1,514,063 | 500,000 |

* Seed sizes were determined from tables in Rules for Seed Testing; seed size and exact number of seed/plants, may vary with local varieties.

** PLS = Pure Live Seed; the percentage by weight of pure seed of the crop which are capable of germinating; i.e., % germination X % purity / 100.

*** Cotton seed PLS varies from year to year, according to Ministerial decree. The 1986-87 minimum PLS (except for Giza 80) was 70%.

**** Onion: green onions--200,000, seed--20,000; Groundnut: Giza 4--35,000, Giza 5, 70,000; Tomato: fresh market--12,000, processing--35,000.

The savings in seed/grain possible through use of improved seed which can allow a 10% reduction in planting rate are shown in Table 4.

TABLE 4
SEED/GRAIN SAVINGS BY USING IMPROVED SEED WHICH REDUCE PLANTING RATE BY 10%
(calculated from ARC & CAS data; based on 1985 crops)

| CROP & SEASON | PRESENT PLANTING RATES | | RATE REDUCED 10% | | GRAIN/ |
|---|---|---|---|---|---|
| | RATE (kg/f) | TOTAL SEED USED (kg) | RATE (kg/f) | TOTAL SEED USED (kg) | SEED SAVED (kg) |
| Artichoke: | 4,000 | 19,852,000 | 3,600 | 17,866,800 | 1,985,200 |
| Nili | | (13,832,000) | | (12,448,800) | (1,383,200) |
| Winter | | (6,020,000) | | (5,418,000) | (602,000) |
| Barley | | | | | |
| Irrigated | 60 | 7,475,940 | 54 | 6,728,346 | 747,594 |
| Bean, broad (vegetable): | | | | | |
| Winter | 30-50 | 39,500 | 45 | 35,550 | 3,950 |
| Bean, broad (for beans) | 75 | 21,353,400 | 68 | 19,360,416 | 1,992,984 |
| Bean, green | 75 | 3,297,450 | 68 | 2,989,688 | 307,762 |
| Bean, green: | 30-40 | 1,139,880 | 36 | 1,025,892 | 113,988 |
| Nili | | (318,200) | | (286,380) | (31,820) |
| Summer | | (490,360) | | (441,324) | (49,036) |
| Winter | | (331,320) | | (298,188) | (33,132) |
| Bean, dried: | 30-40 | 449,760 | 36 | 404,064 | 44,896 |
| Nili | | (185,440) | | (166,896) | (18,544) |
| Summer | | (235,120) | | (211,608) | (23,512) |
| Winter | | (28,400) | | (25,560) | (2,840) |
| Cabbage: | 0.15 | 5,487 | 0.135 | 4,938 | 549 |
| Nili | | (1,820) | | (1,638) | (182) |
| Summer | | (341) | | (307) | (34) |
| Winter | | (3,326) | | (2,993) | (333) |

| CROP & SEASON | PRESENT PLANTING RATES RATE (kg/f) | TOTAL SEED USED (kg) | RATE REDUCED 10% RATE (kg/f) | TOTAL SEED USED (kg) | GRAIN/ SEED SAVED (kg) |
|---|---|---|---|---|---|
| Carrot: | 2-5 | 61,845 | 4.5 | 55,660 | 6,185 |
| Nili | | (12,985) | | (11,687) | (1,298) |
| Summer | | (7,550) | | (6,795) | (755) |
| Winter | | (41,310) | | (37,179) | (4,131) |
| Cauliflower: | 0.4 | 3,808 | 0.36 | 3,427 | 381 |
| Nili | | (855) | | (769) | (86) |
| Summer | | (117) | | (105) | (12) |
| Winter | | (2,836) | | (2,553) | (28) |
| Chickpea | 60 | 1,133,400 | 54 | 1,020,060 | 113,340 |
| Clover, berseem: | 25 | 70,174,175 | 22.5 | 63,156,757 | 7,017,418 |
| Full-season | | (49,299,175) | | (44,369,257) | (4,929,918) |
| Short-season | | (20,875,000) | | (18,769,500) | (2,105,500) |
| Colocasia: | 900 | 6,758,100 | 810 | 6,082,290 | 675,810 |
| Nili | | (26,100) | | (23,490) | (2,610) |
| Summer | | (6,670,800) | | (6,003,720) | (667,080) |
| Winter | | (61,200) | | (55,080) | (6,120) |
| Cotton | 70 | 75,670,630 | 63 | 68,103,567 | 7,567,063 |
| Cowpea, green: | 40 | 124,400 | 36 | 111,960 | 11,320 |
| Nili | | (64,600) | | (58,140) | (6,460) |
| Summer | | (99,160) | | (89,244) | (6,916) |
| Winter | | (640) | | (576) | (64) |
| Cowpea, dried: | 40 | 302,400 | 36 | 272,160 | 30,240 |
| Nili | | (105,560) | | (95,004) | (10,556) |
| Summer | | (196,840) | | (177,156) | (19,684) |
| Cucumber: | 1.5 | 63,233 | 1.35 | 56,990 | 6,333 |
| Nili | | (10,428) | | (9,385) | (1,043) |
| Summer | | (50,895) | | (45,805) | (5,090) |
| Winter | | (1,910) | | (1,710) | (200) |

| CROP & SEASON | PRESENT PLANTING RATES RATE (kg/f) | TOTAL SEED USED (kg) | RATE REDUCED 10% RATE (kg/f) | TOTAL SEED USED (kg) | GRAIN/ SEED SAVED (kg) |
|---|---|---|---|---|---|
| Eggplant: | 0.3 | 10,527 | 0.27 | 9,474 | 1,053 |
| Nili | | (1,989) | | (1,790) | (199) |
| Summer | | (5,875) | | (5,287) | (588) |
| Winter | | (2,662) | | (2,396) | (266) |
| Fenugreek | 25 | 791,750 | 22.5 | 712,575 | 79,175 |
| Flaxseed | 60 | 1,920,000 | 54 | 1,728,000 | 192,000 |
| Garlic | 300 | 4,500,000 | 270 | 4,050,000 | 450,000 |
| Jute, Malta: | 6 | 68,376 | 5.4 | 61,538 | 6,838 |
| Nili | | (28,668) | | (25,801) | (2,867) |
| Summer | | (37,566) | | (33,809) | (3,757) |
| Winter | | (2,142) | | (1,928) | (214) |
| Lentil | 80 | 1,440,000 | 72 | 1,296,000 | 144,000 |
| Lettuce: | 0.5 | 6,621 | 0.45 | 5,959 | 662 |
| Nili | | (151) | | (136) | (15) |
| Summer | | (958) | | (862) | (96) |
| Winter | | (5,513) | | (4,962) | (551) |
| Lupines | 75 | 750,000 | 68 | 680,000 | 70,000 |
| Maize: | 15 | 29,624,505 | 13.5 | 26,662,054 | 2,962,451 |
| Nili | | (7,888,950) | | (7,100,055) | (788,895) |
| Summer | | (21,735,555) | | (19,561,999) | (2,173,556) |
| Mallow, Egyptian: | 10 | 14,160 | 9 | 12,744 | 1,416 |
| Nili | | (30) | | (27) | (3) |
| Winter | | (14,130) | | (12,717) | (1,413) |

| CROP & SEASON | PRESENT PLANTING RATES RATE (kg/f) | TOTAL SEED USED (kg) | RATE REDUCED 10% RATE (kg/f) | TOTAL SEED USED (kg) | GRAIN/ SEED SAVED (kg) |
|---|---|---|---|---|---|
| Mallow, Jews: | 10 | 150,090 | 9 | 131,081 | 15,009 |
| Nili | | (68,950) | | (62,055) | (6,895) |
| Summer | | (74,870) | | (67,383) | (7,487) |
| Winter | | (8,270) | | (7,443) | (827) |
| Melon & cantaloupe: | 1.25 | 35,394 | 1.13 | 31,855 | 3,539 |
| Nili | | (104) | | (94) | (10) |
| Summer | | (32,770) | | (9,493) | (3,277) |
| Winter | | (2,520) | | (2,268) | (252) |
| Okra: | 8 | 80,570 | 7.2 | 72,468 | 8,052 |
| Nili | | (3,456) | | (3,110) | (346) |
| Summer | | (76,920) | | (69,228) | (7,692) |
| Winter | | (160) | | (144) | (16) |
| Onion, summer: | 7 | 451,381 | 6.3 | 406,243 | 45,138 |
| Sole crop | 7 | (80,437) | 6.3 | (72,393) | (8,044) |
| Intercrop | 7 | (370,944) | 6.3 | (333,850) | (37,094) |
| Onion, winter: | 7 | 457,156 | 6.3 | 411,440 | 45,716 |
| Sole crop | 7 | (152,404) | 6.3 | (137,164) | (15,240) |
| Intercrop | 7 | (304,752) | 6.3 | (274,277) | (30,475) |
| Onion, winter green: | 7 | 93,667 | 6.3 | 84,300 | 9,367 |
| Sole crop | 7 | (31,409) | 6.3 | (28,268) | (3,141) |
| Intercrop | 7 | (2,317) | 6.3 | (2,085) | (232) |
| Nili | 7 | (59,941) | 6.3 | (53,947) | (5,994) |
| Pea, green | 40 | 699,840 | 36 | 629,856 | 69,984 |

| CROP & SEASON | PRESENT PLANTING RATES RATE (kg/f) | TOTAL SEED USED (kg) | RATE REDUCED 10% RATE (kg/f) | TOTAL SEED USED (kg) | GRAIN/ SEED SAVED (kg) |
|---|---|---|---|---|---|
| Pea, dried | 40 | 300,560 | 36 | 270,504 | 30,056 |
| Groundnut | 50 | 1,407,600 | 45 | 1,266,840 | 140,760 |
| Pepper: | 0.25 | 6,987 | 0.23 | 6,288 | 699 |
| Nili | | (1,192) | | (1,073) | (119) |
| Summer | | (4,392) | | (3 953) | (439) |
| Winter | | (1,404) | | (1,264) | (140) |
| Potato: | | 175,664,250 | | 158,097,825 | 17,566,425 |
| Nili | 1,500 | (129,138,000) | 1,350 | (116,224,200) | (12,913,800) |
| Summer | 750 | (46,526,250) | 675 | (41,873,625) | (4,652,625) |
| Radish: | 8 | 31,008 | 7.2 | 27,907 | 3,101 |
| Nili | | (7,200) | | (6,480) | (720) |
| Summer | | (10,072) | | (9,065) | (1,007) |
| Winter | | (13,736) | | (12,362) | (1,374) |
| Rice: | 60 | 55,438,260 | 54 | 49,894,434 | 5,543,826 |
| Nili | | (57,060) | | (51,354) | (5,706) |
| Summer | | (55,381,200) | | (49,843,080) | (5,538,120) |
| Sesame | 4 | 104,240 | 3.6 | 93,816 | 10,424 |
| Sorghum: | F-20 | 4,125,000 | F-18 | 3,712,500 | 412,500 |
| Nili | G-8 | (101,544) | G-7.2 | (91,390) | (10,154) |
| Summer | | (4,023,484) | | (3,621,136) | (402,348) |
| Soybean | 40 | 4,761,920 | 36 | 4,285,728 | 476,192 |
| Spinach: | 12 | 78,264 | 10.8 | 70,438 | 7,826 |
| Nili | | (2,412) | | (2,171) | (241) |
| Winter | | (76,212) | | (68,591) | (7,621) |

| CROP & SEASON | PRESENT PLANTING RATES RATE (kg/f) | TOTAL SEED USED (kg) | RATE REDUCED 10% RATE (kg/f) | TOTAL SEED USED (kg) | GRAIN/ SEED SAVED (kg) |
|---|---|---|---|---|---|
| Squash: | 2 | 119,564 | 1.8 | 107,608 | 11,956 |
| Nili | | (27,798) | | (25,018) | (2,780) |
| Summer | | (53,246) | | (47,921) | (5,325) |
| Winter | | (38,520) | | (34,668) | (3,852) |
| Sugarbeet | 12 | 487,464 | 10.8 | 438,718 | 48,746 |
| Tomato: | 0.36 | 122,421 | 0.32 | 108,818 | 13,605 |
| Nili | | (33,323) | | (29,620) | (3,703) |
| Summer | | (38,363) | | (34,100) | (4,263) |
| Winter | | (50,735) | | (45,098) | (5,637) |
| Turnip: | 4 | 27,388 | 3.6 | 24,649 | 2,739 |
| Nili | | (5,060) | | (4,554) | (506) |
| Summer | | (1,160) | | (1,044) | (116) |
| Winter | | (19,728) | | (17,755) | (1,973) |
| Watermelon | 1.5 | 183,248 | 1.35 | 164,923 | 18,325 |
| Wheat | 75 | 88,944,225 | 67.5 | 80,049,802 | 8,894,423 |

## LAND SAVED BY HIGHER YIELDS

If no increase in total production is required, higher yields per feddan can give the same production from fewer feddans. This releases more crop land to produce other crops; this in turn increases overall production of all crops, reduces dependence on imports, permits changing cropping patterns and rotations, and provides a broader crop base for farm income. Table 5 shows savings in crop lands that can be made by using improved seed and the ARC's complete Packages of Improved Production Technology. This table shows the land saved due to average 50% yield increases obtained from ARC's complete improved production package (including improved seed), as was used by USAID/Cairo in establishing the NARP project. In addition, a more conservative land savings from a 10% increase in yields due to partial implementation of improved technology and improved seed are shown in Table 5, in order to show the benefits attained before full implementation of improved technology is achieved.

TABLE 5
LAND SAVED TO PRODUCE THE SAME CROP QUANTITIES AT HIGHER YIELDS FROM IMPROVED SEED & ARC IMPROVED TECHNOLOGY PACKAGES
(1985 crop year data; based on ARC, CAS, & USAID data)

| CROP | LAND USED BY OLD PRODUCTION METHODS (feddans) | LAND REQUIRED TO PRODUCE THE SAME QUANTITY BY IMPROVED TECHNOLOGY (feddans) (50% ave. increase) | LAND SAVING (feddans) 50% INCREASE | LAND SAVING (feddans) 10% INCREASE |
|---|---|---|---|---|
| Artichoke: | 4,963 | 3,309 | 1,654 | 451 |
| Nili | (3,458) | (2,305) | (1,153) | (314) |
| Winter | (1,505) | (1,003) | (502) | (137) |
| Barley: | | | | |
| Irrigated | 124,599 | 83,070 | 41,529 | 11,327 |
| Dryland | | | | |
| Bean, broad (vegetable): | | | | |
| Winter | 790 | 527 | 263 | 72 |

| CROP | LAND USED BY OLD PRODUCTION METHODS (feddans) | LAND REQUIRED TO PRODUCE THE SAME QUANTITY BY IMPROVED TECHNOLOGY (feddans) (50% ave. increase) | LAND SAVING (feddans) 50% INCREASE | LAND SAVING (feddans) 10% INCREASE |
|---|---|---|---|---|
| Bean, broad (for beans) | 284,712 | 189,817 | 94,895 | 25,883 |
| Bean, green | 43,966 | 29,312 | 14,654 | 3,997 |
| Bean, green: | 28,497 | 18,999 | 9,498 | 2,591 |
| Nili | (7,955) | (5,304) | (2,651) | (723) |
| Summer | (12,259) | (8,173) | (4,086) | (1,114) |
| Winter | (8,283) | (5,522) | (2,761) | (753) |
| Bean, dried: | 11,224 | 7,483 | 3,741 | 1,020 |
| Nili | (4,636) | (3,091) | (1,545) | (421) |
| Summer | (5,878) | (3,919) | (1,959) | (534) |
| Cabbage: | 36,577 | 24,386 | 12,191 | 3,325 |
| Nili | (12,130) | (8,087) | (4,043) | (1,103) |
| Summer | (2,271) | (1,514) | (757) | (206) |
| Winter | (22,176) | (14,785) | (7,391) | (2,016) |
| Carrot: | 12,369 | 8,246 | 4,123 | 1,124 |
| Nili | (2,597) | (1,731) | (866) | (236) |
| Summer | (1,510) | (1,007) | (503) | (137) |
| Winter | (8,262) | (5,508) | (2,754) | (751) |
| Cauliflower: | 9,520 | 6,347 | 3,173 | 865 |
| Nili | (2,137) | (1,425) | (712) | (194) |
| Summer | (292) | (195) | (97) | (27) |
| Winter | (7,091) | (4,728) | (2,363) | (645) |
| Chickpea | 18,890 | 12,594 | 6,296 | 1,717 |
| Clover, berseem: | 2,806,967 | 1,871,405 | 935,562 | 255,179 |
| Full-season | (1,971,967) | (1,314,710) | (657,257) | (179,270) |
| Short-season | (835,000) | (556,695) | (278,305) | (75,909) |

| CROP | LAND USED BY OLD PRODUCTION METHODS (feddans) | LAND REQUIRED TO PRODUCE THE SAME QUANTITY BY IMPROVED TECHNOLOGY (feddans) (50% ave. increase) | LAND SAVING (feddans) 50% INCREASE | LAND SAVING (feddans) 10% INCREASE |
|---|---|---|---|---|
| Colocasia: | 7,509 | 5,006 | 2,503 | 683 |
| Nili | (29) | (19) | (10) | (3) |
| Summer | (7,412) | (4,942) | (2,470) | (674) |
| Winter | (68) | (45) | (23) | (6) |
| Cotton | 1,081,009 | 720,709 | 360,300 | 98,274 |
| Cowpea, green: | 4,110 | 2,740 | 1,370 | 374 |
| Nili | (1,615) | (1,077) | (538) | (147) |
| Summer | (2,479) | (1,653) | (826) | (225) |
| Winter | (16) | (11) | (5) | (1.5) |
| Cowpea, dried: | 7,560 | 5,040 | 2,520 | 687 |
| Nili | (2,639) | (1,759) | (880) | (240) |
| Summer | (4,921) | (3,281) | (1,640) | (447) |
| Cucumber: | 42,215 | 28,145 | 14,070 | 3,838 |
| Nili | (6,952) | (4,635) | (2,317) | (632) |
| Summer | (33,930) | (22,621) | (11,309) | (3,085) |
| Winter | (1,333) | (889) | (444) | (121) |
| Eggplant: | 35,089 | 23,394 | 11,695 | 3,190 |
| Nili | (6,631) | (4,421) | (2,210) | (603) |
| Summer | (19,583) | (13,056) | (6,527) | (1,780) |
| Winter | (8,873) | (5,916) | (2,957) | (807) |
| Fenugreek | 31,670 | 21,114 | 10,556 | 2,879 |
| Flaxseed | 32,000 | 21,334 | 10,666 | 2,909 |
| Garlic | 15,000 | 10,001 | 4,999 | 1,364 |

| CROP | LAND USED BY OLD PRODUCTION METHODS (feddans) | LAND REQUIRED TO PRODUCE THE SAME QUANTITY BY IMPROVED TECHNOLOGY (feddans) (50% ave. increase) | LAND SAVING (feddans) 50% INCREASE | LAND SAVING (feddans) 10% INCREASE |
|---|---|---|---|---|
| Jute, Malta: | 11,396 | 7,598 | 3,798 | 1,036 |
| Nili | (4,778) | (3,185) | (1,593) | (434) |
| Summer | (6,261) | (4,174) | (2,087) | (569) |
| Winter | (357) | (238) | (119) | (32) |
| Lentil | 18,000 | 12,001 | 5,999 | 1,636 |
| Lettuce: | 13,242 | 8,828 | 4,414 | 1,204 |
| Nili | (301) | (201) | (100) | (27) |
| Summer | (1,916) | (1,277) | (639) | (174) |
| Winter | (11,025) | (7,350) | (3,675) | (1,002) |
| Lupines | 10,000 | 6,667 | 3,333 | 909 |
| Maize: | 1,974,967 | 1,316,710 | 658,257 | 179,542 |
| Nili | (525,930) | (350,638) | (175,292) | (47,812) |
| Summer | (1,449,037) | (966,073) | (482,964) | (131,731) |
| Mallow, Egyptian: | 1,416 | 944 | 472 | 1[illegible] |
| Nili | (3) | (2) | (1) | (0.2) |
| Winter | (1,413) | (942) | (471) | (128) |
| Mallow, Jews: | 15,009 | 10,007 | 5,002 | 1,364 |
| Nili | (6,895) | (4,597) | (2,298) | (627) |
| Summer | (7,487) | (4,992) | (2,495) | (681) |
| Winter | (827) | (551) | (276) | (75) |
| Melon & cantaloupe: | 28,315 | 18,878 | 9,437 | 2,574 |
| Nili | (83) | (55) | (28) | (7.5) |
| Summer | (26,216) | (17,478) | (8,738) | (2,383) |
| Winter | (2,016) | (1,344) | (672) | (183) |

| CROP | LAND USED BY OLD PRODUCTION METHODS (feddans) | LAND REQUIRED TO PRODUCE THE SAME QUANTITY BY IMPROVED TECHNOLOGY (feddans) (50% ave. increase) | LAND SAVING (feddans) 50% INCREASE | LAND SAVING (feddans) 10% INCREASE |
|---|---|---|---|---|
| Okra: | 10,065 | 6,710 | 3,355 | 915 |
| Nili | (432) | (288) | (144) | (39) |
| Summer | (9,615) | (6,410) | (3,205) | (874) |
| Winter | (8) | (5) | (3) | (0.7) |
| Onion, summer: | 64,483 | 42,991 | 21,492 | 5,862 |
| Sole crop | (11,491) | (7,661) | (3,830) | (1,045) |
| Intercrop | (52,992) | (35,330) | (17,662) | (4,817) |
| Onion, winter: | 65,308 | 43,541 | 21,767 | 5,937 |
| Sole crop | (21,772) | (14,515) | (7,257) | (1,979) |
| Intercrop | (43,536) | (29,025) | (14,511) | (3,958) |
| Onion, winter green: | 13,381 | 8,921 | 4,460 | 1,216 |
| Sole crop | (4,487) | (2,991) | (1,496) | (408) |
| Intercrop | (331) | (221) | (110) | (30) |
| Nili | (8,563) | (5,709) | (2,854) | (778) |
| Pea, green | 17,496 | 11,665 | 5,831 | 1,591 |
| Pea, dried | 7,514 | 5,010 | 2,504 | 683 |
| Groundnut | 28,152 | 18,769 | 9,383 | 2,559 |
| Pepper: | 27,947 | 18,632 | 9,315 | 2,541 |
| Nili | (4,766) | (3,177) | (1,589) | (433) |
| Summer | 1(7,567) | (11,712) | (5,855) | (1,597) |
| Winter | (5,614) | (3,743) | (1,871) | (510) |
| Potato: | 148,127 | 98,756 | 49,371 | 13,466 |
| Nili | (86,092) | (57,398) | (28,694) | (7,827) |
| Summer | (62,035 | (41,359) | (20,676) | (5,640) |

| CROP | LAND USED BY OLD PRODUCTION METHODS (feddans) | LAND REQUIRED TO PRODUCE THE SAME QUANTITY BY IMPROVED TECHNOLOGY (feddans) (50% ave. increase) | LAND SAVING (feddans) 50% INCREASE | LAND SAVING (feddans) 10% INCREASE |
|---|---|---|---|---|
| Radish: | 3,876 | 2,584 | 1,292 | 352 |
| Nili | (900) | (600) | (300) | (82) |
| Summer | (1,259) | (839) | (420) | (114) |
| Winter | (1,717) | (1,145) | (572) | (156) |
| Rice: | 923,971 | 616,011 | 307,960 | 83,997 |
| Nili | (951) | (634) | (317) | (86) |
| Summer | (923,020) | (615,377) | (307,643) | (83,911) |
| Sesame | 26,060 | 17,374 | 8,686 | 2,369 |
| Sorghum: | 375,000 | 250,013 | 124,987 | 34,091 |
| Nili | (9,230) | (6,154) | (3,076) | (839) |
| Summer | (365,770) | (243,859) | (121,911) | (33,252) |
| Soybean | 119,048 | 79,369 | 39,679 | 10,823 |
| Spinach: | 6,522 | 4,348 | 2,174 | 593 |
| Nili | (201) | (134) | (67) | (18) |
| Winter | (6,351) | (4,234) | (2,117) | (577) |
| Squash: | 59,782 | 39,857 | 19,925 | 5,435 |
| Nili | (13,899) | (9,266) | (4,633) | (1,264) |
| Summer | (26,623) | (17,750) | (8,873) | (2,420) |
| Winter | (19,260) | (12,841) | (6,419) | (1,751) |
| Sugarbeet | 40,622 | 27,083 | 13,539 | 3,693 |
| Tomato: | 340,057 | 226,716 | 113,341 | 30,914 |
| Nili | (92,564) | (61,712) | (30,852) | (8,415) |
| Summer | (106,563) | (71,046) | (35,517) | (9,688) |
| Winter | (140,930) | (93,958) | (46,974) | (12,812) |

| CROP | LAND USED BY OLD PRODUCTION METHODS (feddans) | LAND REQUIRED TO PRODUCE THE SAME QUANTITY BY IMPROVED TECHNOLOGY (feddans) (50% ave. increase) | LAND SAVING (feddans) 50% INCREASE | LAND SAVING (feddans) 10% INCREASE |
|---|---|---|---|---|
| Turnip: | 6,847 | 4,565 | 2,282 | 622 |
| Nili | (1,265) | (843) | (422) | (115) |
| Summer | (290) | (193) | (97) | (26) |
| Winter | (4,932) | (3,288) | (1,644) | (448) |
| Watermelon | 122,165 | 81,4[illegible]7 | 40,718 | 11,106 |
| Wheat | 1,185,923 | 790,655 | 395,268 | 107,811 |

# IV

## CURRENT SEED SUPPLY STATUS

The seed program supplies large amounts of seed; however, it is seriously outmoded and lagging behind in technology, training and facilities, so that the seed it supplies is not uniformly of the high quality needed by Egyptian farmers, seed costs are higher, and operating efficiency is low.

Facilities are old and overtaxed, so seed is excessively costly in money, labor, and time; there is no flexibility (i.e., the essential over-capacity) for growth in supply or to meet changing crop seed needs. Personnel of CAS, EAA, and other government/private-sector seed programs/components are not adequately trained, so they cannot be efficient and operate the facilities effectively. Quality control systems are inadequate due to lack of equipment, operating funds, and properly-trained personnel, so seed quality is lower.

Crop yields are lower than they should be; transfer of technology to farmers is slow and incomplete; excessive planting rates are used (see Table 2); stands are mixed and inconsistent; and greater crop losses occur due to weeds and diseases (see page 9 for an example). Crop yields and total production are lower by 30-80% than they could be if truly-improved seed and ARC's improved production practices were used (USAID-NARP).

The Winrock/USAID Study (1985) evaluated the seed supply industry/system as: "Egypt's seed industry is at a stage which requires a thorough re-examination and better planning and organization for the future. Signs of serious inefficiency have emerged: during the past 5 years the area in wheat and rice seed production expanded dramatically, while output of certified seed declined. A rice blast disease outbreak necessitated withdrawal of a major new variety, raising questions about security of the improved seed supply. Organization and management of facilities requires clarification. Seed production is using more land and is costing much more than is necessary, while quality is not maintained. A policy should be adopted giving first priority to quality rather than to quantity. Seed distribution through the PBDAC often relies on requiring farmers to take seed in order to obtain fertilizer or credit; thus, the system becomes unresponsive to farmer needs and demands, and valuable information is lost. Roles of the private and public sectors in seed production are not entirely clear, and the resulting air of uncertainty serves to discourage expansion of valuable private-sector involvement. The need for public-sector leadership in such areas as research, development, and quality control is clear. Production of certain seed such as wheat, rice and many other open-pollinated crops, will also remain in the public sector for some time to come".

"Many existing seed testing and processing facilities are old and require replacement. Nobody has stopped to make a clear plan to balance what is being scheduled with what is needed. Managerial improvements in existing and new plants would reduce plant capacity requirements; nevertheless, new facilities will be needed. Maintaining varietial/species purity has long been a major problem in cotton seed supply, because seed are taken from the farm along with the fiber. Seed mixing when cotton is ginned, plus substantial outcrossing, contaminate seed varietal purity and also affect the fiber's spinning value".

"While governmental agencies are responsible for supplying seed and have recently encouraged private-sector participation, significant amounts of non-certified seed are still grown and saved by private farmers for their own use and for sale to neighbors".

**FARMER SEED NEEDS**

The seed needed by Egyptian farmers in the 1985 crop year (the latest for which data was available) is shown in Table 6. In that year, total cultivated area was 5,906,856 feddans, and average farm size was 1.6 feddans. Seed use is shown by crop, and by the season in which it was planted. Table 6 also shows total area cropped through multiple-cropping.

TABLE 6
TOTAL 1985 SEED REQUIREMENTS OF EGYPTIAN FARMERS
(Compiled from CAS & ARC data, 1987)

| CROP | AREA HARVESTED (feddans) | REQUIREMENTS FOR PLANTING SEED | |
|---|---|---|---|
| | | PLANTING RATE (kg/feddan) | TOTAL SEED NEEDS (kg) |
| Artichoke: | 4,963 | 4,000 | 19,852,000 |
| Nili | (3,458) | (no. of cuttings) | (13,832,000) |
| Winter | (1,505) | | (6,020,000) |
| Barley: | | | |
| Irrigated | 124,599 | 60 | 7,475,940 |
| Dryland | | | |
| Bean, broad (vegetable): | | | |
| Winter | 790 | 30 - 50 | 39,500 |
| Bean, broad (for beans) | 284,712 | 50 | 14,235,600 |
| Bean, green | 43,966 | 75 | 3,297,450 |
| Bean, green: | 28,497 | 30 - 40 | 1,139,880 |
| Nili | (7,955) | | (318,200) |
| Summer | (12,259) | | (490,360) |
| Winter | (8,283) | | (331,320) |
| Bean, dried: | 11,224 | 30 - 40 | 448,960 |
| Nili | (4,636) | | (185,440) |
| Summer | (5,878) | | (235,120) |
| Winter | (710) | | (28,400) |
| Cabbage: | 36,577 | 0.15 | 5,487 |
| Nili | (12,130) | | (1,820) |
| Summer | (2,271) | | (341) |
| Winter | (22,176) | | (3,326) |

| CROP | AREA HARVESTED (feddans) | REQUIREMENTS FOR PLANTING SEED: PLANTING RATE (kg/feddan) | TOTAL SEED NEEDS (kg) |
|---|---|---|---|
| Carrot: | 12,369 | 2 - 5 | 61,845 |
| Nili | (2,597) | | (12,985) |
| Summer | (1,510) | | (7,550) |
| Winter | (8,262) | | (41,310) |
| Cauliflower: | 9,520 | 0.40 | 3,808 |
| Nili | (2,137) | | (855) |
| Summer | (292) | | (117) |
| Winter | (7,091) | | (2,836) |
| Chickpea | 18,890 | 60 | 1,133,400 |
| Clover, berseem: | 2,806,967 | 25 | 70,174,175 |
| Full-season | (1,971,967) | | (49,299,175) |
| Short-season | (835,000) | | (20,875,000) |
| Colocasia: | 7,509 | 900 (no. of tubers) | 150,180 |
| Nili | (29) | | (580) |
| Summer | (7,412) | | (148,240) |
| Winter | (68) | | (1,360) |
| Cotton | 1,081,009 | 70 | 75,670,630 |
| Cowpea, green: | 4,110 | 40 | 164,400 |
| Nili | (1,615) | | (64,600) |
| Summer | (2,479) | | (99,160) |
| Winter | (16) | | (640) |
| Cowpea, dried: | 7,560 | 40 | 302,400 |
| Nili | (2,639) | | (105,560) |
| Summer | (4,921) | | (196,840) |
| Cucumber: | 42,215 | | 63,989 |
| Nili | (6,952) | 1 - 1.5 | (10,428) |
| Summer | (33,930) | 1 - 1.5 | (50,895) |
| Winter | (1,333) | 2 | (2,666) |

| CROP | AREA HARVESTED (feddans) | REQUIREMENTS FOR PLANTING SEED: PLANTING RATE (kg/feddan) | TOTAL SEED NEEDS (kg) |
|---|---|---|---|
| Eggplant: | 35,089 | 0.2 - 0.3 | 10,527 |
| Nili | (6,631) | | (1,989) |
| Summer | (19,583) | | (5,875) |
| Winter | (8,873) | | (2,662) |
| Fenugreek | 31,670 | 25 | 791,750 |
| Flaxseed | 32,000 | 60 | 1,920,000 |
| Garlic | 15,000 | 300 (kg bulbs) | 4,500,000 |
| Jute, Malta: | 11,396 | 6 | 68,376 |
| Nili | (4,778) | | (28,668) |
| Summer | (6,261) | | (37,566) |
| Winter | (357) | | (2,142) |
| Lentil | 18,000 | 80 | 1,440,000 |
| Lettuce: | 13,242 | 0.5 | 6,621 |
| Nili | (301) | | (151) |
| Summer | (1,916) | | (958) |
| Winter | (11,025) | | (5,513) |
| Lupines | 10,000 | 75 | 750,000 |
| Maize: | 1,974,967 | 15 | 29,624,505 |
| Nili | (525,930) | | (7,888,950) |
| Summer | (1,449,037) | | (21,735,555) |
| Mallow, Egyptian: | 1,416 | 10 | 14,160 |
| Nili | (3) | | (30) |
| Winter | (1,413) | | (14,130) |
| Mallow, Jews: | 15,009 | 10 | 150,090 |
| Nili | (6,895) | | (68,950) |
| Summer | (7,487) | | (74,870) |
| Winter | (827) | | (8,270) |

| CROP | AREA HARVESTED (feddans) | REQUIREMENTS FOR PLANTING SEED: PLANTING RATE (kg/feddan) | TOTAL SEED NEEDS (kg) |
|---|---|---|---|
| Melon & cantaloupe: | 28,315 | 1.25 | 35,394 |
| Nili | (83) | | (104) |
| Summer | (26,216) | | (32,770) |
| Winter | (2,016) | | (2,520) |
| Okra: | 10,065 | | 195,916 |
| Nili | (4,[illegible]2) | 6 - 8 | (3,456) |
| Summer | (9,615) | 12 - 20 | (192,300) |
| Winter | (8) | 12 - 20 | (160) |
| Onion, summer: | 64,483 | 7 | 451,381 |
| Sole crop | (11,491) | 7 | (80,437) |
| Intercrop | (52,992) | 7 | (370,944) |
| Onion, winter green: | 13,381 | 7 | 93,667 |
| Sole crop | (4,487) | 7 | (31,409) |
| Intercrop | (331) | 7 | (2,317) |
| Nili | (8,563) | 7 | (59,941) |
| Pea, green: | 17,496 | 40 | 699,840 |
| Nili | (29) | | (1,160) |
| Summer | (15) | | (600) |
| Winter | (17,452) | | (698,080) |
| Pea, dried: | | | |
| Winter | 7,514 | 40 | 300,560 |
| Groundnut | 28,152 | 50 | 1,407,600 |
| Pepper: | 27,947 | 0.25 | 6,987 |
| Nili | (4,766) | | (1,192) |
| Summer | (17,567) | | (4,392) |
| Winter | (5,614) | | (1,404) |

| CROP | AREA HARVESTED (feddans) | REQUIREMENTS FOR PLANTING SEED: PLANTING RATE (kg/feddan) | TOTAL SEED NEEDS (kg) |
|---|---|---|---|
| Potato: | 148,127 | | 175,664,250 |
| Nili | (86,092) | 1,500 | (129,138,000) |
| Summer | (62,035) | 750 | (46,526,250) |
| Radish: | 3,876 | 5 - 8 | 31,008 |
| Nili | (900) | | (7,200) |
| Summer | (1,259) | | (10,072) |
| Winter | (1,717) | | (13,736) |
| Rice: | 923,971 | 60 | 55,438,260 |
| Nili | (951) | | (57,060) |
| Summer | (923,020) | | (55,381,200) |
| Sesame | 26,060 | 4 | 104,240 |
| Sorghum: | 375,000 | Forage: 15 - 20 | 4,125,000 |
| Nili | (9,230) | Grain: 6 - 8 | (101,544) |
| Summer | (365,770) | | (4,023,484) |
| Soybean | 119,048 | 40 | 4,761,920 |
| Spinach: | 6,522 | 8 - 12 | 78,264 |
| Nili | (201) | | (2,412) |
| Winter | (6,351) | | (76,212) |
| Squash: | 59,782 | 1 - 2 | 119,564 |
| Nili | (13,899) | | (27,798) |
| Summer | (26,623) | | (53,246) |
| Winter | (19,260) | | (38,520) |
| Sugarbeet | 40,622 | 12 | 487,464 |
| Tomato: | 340,057 | 0.12 - 0.36 | 122,421 |
| Nili | (92,564) | | (33,323) |
| Summer | (106,563) | | (38,363) |
| Winter | (140,930) | | (50,735) |

| CROP | AREA HARVESTED (feddans) | REQUIREMENTS FOR PLANTING SEED PLANTING RATE (kg/feddan) | TOTAL SEED NEEDS (kg) |
|---|---|---|---|
| Turnip: | 6,847 | 4 | 27,388 |
| Nili | (1,265) | | (5,060) |
| Summer | (290) | | (1,160) |
| Winter | (4,932) | | (19,728) |
| Watermelon | 122,165 | 1.50 | 183,248 |
| Wh[illegible] | 1,185,923 | 75 | 88,944,225 |

Total seed requirements for each Governorate are shown in Table 7.

TABLE 7
SEED REQUIREMENTS BY GOVERNORATE
(Compiled from CAS & ARC data, 1987)
(some differences may occur due to rounding)

| GOVERNORATE | TOTAL SEED REQUIREMENTS (mt) OF*: | | | |
|---|---|---|---|---|
| | FIELD CROPS | VEGETABLES | TUBERS | TOTAL |
| LOWER EGYPT: | | | | |
| Alexandria | 2,117 | 822 | 10,464 | 13,404 |
| Beheira | 37,580 | 719 | 70,591 | 108,890 |
| Gharbia | 28,193 | 459 | 19,246 | 47,898 |
| Kafr El Sheikh | 37,970 | 80 | 460 | 38,509 |
| Dakahlia | 52,648 | 714 | 9,462 | 62,824 |
| Damietta | 6,934 | 51 | 2,111 | 9,096 |
| Sharkhia | 44,261 | 695 | 6,579 | 51,535 |
| Ismailia | 3,719 | 223 | 402 | 4,345 |
| Suez | 227 | 30 | | 257 |
| Menoufia | 16,970 | 424 | 51,591 | 68,985 |
| Kalubia | 6,705 | 586 | 10,992 | 18,283 |
| Cairo | 103 | 8 | 32 | 143 |
| MIDDLE EGYPT: | | | | |
| Giza | 4,469 | 851 | 31,421 | 36,741 |
| Beni Suef | 16,486 | 569 | 2,183 | 19,240 |
| Fayoum | 15,667 | 392 | 36 | 16,094 |
| Minia | 27,458 | 381 | 15,203 | 43,042 |
| UPPER EGYPT: | | | | |
| Assiut | 22,509 | 60 | 605 | 23,274 |
| Sohag | 20,555 | 168 | 2,226 | 22,949 |
| Qena | 10,130 | 201 | 92 | 10,422 |
| Aswan | 2,101 | 39 | 31 | 2,081 |
| NATIONAL TOTALS | 356,712 | 7,475 | 233,728 | 597,915 |

* Field crops include: barley, broad bean for beans, dried bean, chickpea, berseem clover, cotton, dried cowpea, flaxseed, Malta jute, lentil, lupines, maize, melon & cantaloupe, dried pea, groundnut, rice, sesame, sorghum, soybean, sugarbeet, watermelon, & wheat.
  Vegetables include: broad bean (vegetable use), green bean, cabbage, carrot, cauliflower, green cowpea, cucumber, eggplant, fenugreek, lettuce, Egyptian mallow, Jews mallow, onion, okra, green pea, pepper, radish, spinach, squash, tomato, & turnip.
  Tubers, etc,. include: artichoke, colocasia, garlic, & potato.

## SEED FOR FARMERS SUPPLIED BY ORGANIZED PROGRAMS

The amounts of seed supplied in 1985 by organized domestic seed-producing/contracting/processing programs are shown in Table 8. This includes both government and private-sector agencies, primarily CAS.

TABLE 8
SEED SUPPLIED BY ORGANIZED SEED PROGRAMS IN 1985
(Source: CAS documents, 1987)

| CROP | SEED SUPPLIED (mt) | % OF TOTAL FARMER SEED NEEDS |
|---|---|---|
| Cotton | 85,000 | 112.33 |
| Wheat | 100,000 | 112.43 |
| Rice | 80,000 | 144.30 |
| Barley | 7,000 | 93.63 |
| Maize | 8,000 | 27.00 |
| Faba bean | 20,000 | 93.49 |
| Onion | 100 | 9.98 |
| Sesame | 30 | 28.78 |
| Groundnut | 700 | 49.73 |
| Lentil | 1,100 | 76.39 |
| Soybean | 6,000 | 126.00 |
| Watermelon | 220 | 120.06 |
| Melon | 50 | 141.27 |
| Cucumber | 70 | 109.39 |
| Squash | 85 | 71.09 |
| String bean | 500 | 15.16 |
| Phaseolus bean | 1,500 | 131.59 |
| Pea | 850 | 85.0 |
| Pepper | 9 | 128.81 |
| Eggplant | 10 | 94.99 |
| Carrot | 36 | 58.21 |
| TOTAL | 311,260 metric tons | |

62

## SOURCES OF SEED PLANTED BY FARMERS

Sources of seed used by farmers are reported to be as shown in Table 9.

TABLE 9
SOURCES OF SEED USED BY FARMERS
(compiled by CAS, 1987)

| CROP | SOURCE OF PLANTING SEED USED (%) | | |
|---|---|---|---|
| | FARMER-SAVED | EGYPT SEED PROGRAMS | IMPORTED |
| Artichoke | 100 | [illegible] | 0 |
| Barley | 85 | 15 | -- |
| Bean, broad | 50 | 50 | -- |
| Bean, green | 100 | -- | -- |
| Bean, dried | 100 | -- | -- |
| Beet, garden | | | |
| Cabbage | 80 | -- | 20 |
| Carrot | 74 | -- | 26 |
| Cauliflower | 88 | -- | 12 |
| Chickpea | 100 | -- | -- |
| Clover, berseem | 100 | -- | -- |
| Colocasia | 100 | -- | -- |
| Cotton | -- | 100 | -- |
| Cowpea | 100 | -- | -- |
| Cucumber | 40 | -- | 60 |
| Eggplant | 91 | -- | 9 |
| Fenugreek | 100 | -- | -- |
| Flaxseed | 100 | -- | -- |
| Garlic | 70 | -- | 30 |
| Jute, Malta | 100 | -- | -- |
| Lentil | 40 | 60 | -- |
| Lettuce | 99.97 | -- | 0.03 |
| Lupines | 100 | -- | -- |
| Maize | 70 | 30 | -- |

| CROP | SOURCE OF PLANTING SEED USED (%) | | |
|---|---|---|---|
| | FARMER-SAVED | EGYPT SEED PROGRAMS | IMPORTED |
| Mallow, Egyptian | 100 | -- | -- |
| Mallow, Jews | 100 | -- | -- |
| Melon & cantaloupe | 59 | -- | 41 |
| Okra | 100 | -- | -- |
| Onion | 30 | 70 | -- |
| Pea, green | 94.5 | -- | 5.5 |
| Pea, dried | 94.5 | -- | 5.5 |
| Groundnut | 70 | 30 | -- |
| Pepper | 96 | -- | 4 |
| Potato | 20 | -- | 80 |
| Radish | 100 | -- | -- |
| Rice | 40 | 60 | -- |
| Sesame | 85 | 15 | -- |
| Sorghum | 90 | 10 | -- |
| Soybean | -- | 100 | -- |
| Spinach | 95 | -- | 5 |
| Squash | 99.8 | -- | 0.2 |
| Sugarbeet | 84 | -- | 16 |
| Tomato | 58 | -- | 42 |
| Turnip | 100 | -- | -- |
| Watermelon | 97 | -- | 3 |
| Wheat | 50 | 50 | -- |
| AVERAGE | 78.81 | 13.11 | 7.86 |

## SEED QUALITY

The organized seed program works diligently, and many dedicated individuals devote their utmost efforts to seed supply. However, due to lack of facilities, technical training, operating funds, and technical knowledge adequate to develop and implement effective procedures, all seed has not been of the quality required to take research developments to farmers. Existing facilities cannot adequately protect seed from loss and deterioration after it is tested and before it reaches the farmer; during this critical period much seed quality is reported to be lost, so seed reaching the farmer may not always be of the labelled quality. Fortunately, Egypt has an arid climate this alone has made possible continued operation of the seed supply program as it is now structured and equipped. Furthermore, the facilities do not permit increase in seed supply and/or supplying new crops, or service-support to new private-sector seed operations.

Wheat is a major crop; to determine the quality of wheat seed actually used, ARC and ICARDA collaborated in conducting a survey of wheat seed quality at different levels of the distribution system. This survey covered a number of sites in the Governorates of Beheira, Dakahlia, Menoufia, Minia, and Sahrkhia. Seed was sampled at several points in the distribution system:

A. At the CAS processing plant.

B. At the PBDAC store.

C. At the local cooperative.

D. At the farmer's, at planting time.

Due to the season when samples were taken, it was not possible to get samples from all levels in all sampled Governorates. The collected wheat seed samples were analyzed by ARC's FCRI Seed Research Section for germination, physical (mechanical) purity, and for varietal purity as determined by the phenol test. Results are summarized in Table 10. Note that much of the seed in all sampling locations was from the same source; while the sampled lots were not exactly the same, most of the sampled seed originated from the same source; only a part of the seed sampled at the farmer level came from a different source. Thus, this survey really measured only variations among seed lots supplied by the government seed program, and changes in seed quality as the seed moved through the distribution channels.

Wheat is self-pollinated, so it is relatively easy to maintain genetic purity; the primary problems are mixtures in the field, in handling and in processing. It is a large-seeded small grain, so it is relatively easy to process and bring to high physical purity. It is a hardy seed, so it is easy to maintain high germination. In general, most wheat seed has--or should have--high genetic, physical and germination quality.

TABLE 10
WHEAT SEED QUALITY AT DIFFERENT DISTRIBUTION LEVELS
IN SELECTED GOVERNORATES
(from survey data compiled by ARC & ICARDA, 1985)

| QUALITY CHARACTER & GOVERNORATE | AVERAGE QUALITY FOUND AT THE LEVEL OF*: PROCESSING | PBDAC STORE | COOPERATIVE | FARMER |
|---|---|---|---|---|
| BEHERA GOVERNORATE: | | | | |
| Physical Purity %: | | | | |
| Average | --- | 99.35 | 99.01 | --- |
| Low | --- | 98.80 | 95.70 | --- |
| High | --- | 99.70 | 99.70 | --- |
| Germination %: | | | | |
| Average | --- | 89.1 | 93.2 | --- |
| Low | --- | 76.0 | 84.0 | --- |
| High | --- | 96.0 | 98.0 | --- |
| Varietal Purity (% of samples in each category): | | | | |
| Few offtypes | --- | 10 | 4.7 | --- |
| Many offtypes | --- | | 4.8 | --- |
| Very many offtypes | --- | | | --- |
| Quite pure | --- | | | --- |
| Mixture | --- | 90 | 90.5 | --- |
| MENOUFIA GOVERNORATE: | | | | |
| Physical Purity %: | | | | |
| Average | --- | 98.8 | 98.7 | 94.6 |
| Low | --- | 97.6 | 93.9 | 85.1 |
| High | --- | 99.6 | 99.6 | 99.0 |

| QUALITY CHARACTER & GOVERNORATE | AVERAGE QUALITY FOUND AT THE LEVEL OF*: PROCESSING | PBDAC STORE | COOPERATIVE | FARMER |
|---|---|---|---|---|
| MENOUFIA GOVERNORATE (continued): | | | | |
| Germination %: | | | | |
| Average | --- | 92.25 | 94.2 | 93.0 |
| Low | --- | 90.0 | 89.0 | 87.0 |
| High | --- | 94.0 | 98.0 | 97.0 |
| Varietal Purity (% of samples in each category): | | | | |
| Few offtypes | --- | --- | 59.4 | 33.3 |
| Many offtypes | --- | 75.0 | 21.9 | 16.7 |
| Very many offtypes | --- | --- | --- | 33.3 |
| Quite pure | --- | 25.0 | 18.7 | 16.7 |
| MINIA GOVERNORATE: | | | | |
| Physical Purity %: | | | | |
| Average | 97.95 | 99.30 | 99.10 | 97.8 |
| Low | 97.40 | 98.80 | 98.40 | 93.9 |
| High | 98.50 | 99.60 | 99.60 | 99.7 |
| Germination %: | | | | |
| Average | 95.5 | 95.8 | 96.0 | 96.2 |
| Low | 93.0 | 93.0 | 87.0 | 87.0 |
| High | 98.0 | 99.0 | 99.0 | 100 |
| Varietal Purity (% of samples in each category): | | | | |
| Many offtypes | 100 | 60 | 39.4 | 28.2 |
| Very many offtypes | --- | --- | 3.0 | 3.1 |
| Few offtypes | --- | 20 | 57.6 | 53.1 |
| Quite pure | --- | 20 | --- | 3.1 |
| Mixture | --- | --- | --- | 12.5 |

| QUALITY CHARACTER & GOVERNORATE | AVERAGE QUALITY FOUND AT THE LEVEL OF*: PROCESSING | PBDAC STORE | COOPERATIVE | FARMER |
|---|---|---|---|---|
| **SAHRKHIA GOVERNORATE:** | | | | |
| **Physical Purity %:** | | | | |
| Average | --- | 98.7 | 98.9 | 97.95 |
| Low | --- | 95.5 | 95.9 | 96.1 |
| High | --- | 99.7 | 99.8 | 99.8 |
| **Germination %:** | | | | |
| Average | --- | 94.6 | 95.7 | 94.5 |
| Low | --- | 90 | 90 | 92 |
| High | --- | 99 | 100 | 97 |
| **Genetic Purity (% of samples in each category):** | | | | |
| Few offtypes | --- | 36.4 | 38.1 | --- |
| Many offtypes | --- | 33.3 | 47.6 | 50 |
| Very many offtypes | --- | 9.1 | 4.8 | --- |
| Quite pure | --- | 18.2 | 9.5 | --- |
| Mixture | --- | --- | --- | 50 |
| **DAKAHLIA GOVERNORATE:** | | | | |
| **Physical Purity %:** | | | | |
| Average | --- | 99.1 | 99.3 | 96.9 |
| Low | --- | 97.3 | 98.0 | 73.9 |
| High | --- | 99.7 | 99.8 | 100 |
| **Germination %:** | | | | |
| Average | --- | 93.9 | 94.1 | 91.8 |
| Low | --- | 91.0 | 87.0 | 73.0 |
| High | --- | 97.0 | 99.0 | 98.0 |

| QUALITY CHARACTER & GOVERNORATE | AVERAGE QUALITY FOUND AT THE LEVEL OF*: PROCESSING | PBDAC STORE | COOPERATIVE | FARMER |
|---|---|---|---|---|
| DAKAHLIA GOVERNORATE (continued): | | | | |
| Genetic Purity (% of samples in each category): | | | | |
| Few offtypes | --- | 37.5 | 23.5 | 16.7 |
| Many offtypes | --- | 12.5 | 23.5 | 20.8 |
| Very many offtypes | --- | --- | 17.6 | 4.2 |
| Quite pure | --- | 12.5 | 5.9 | 16.7 |
| Mixture | --- | 37.5 | 29.4 | 41.7 |

* Due to sampling season, seed was not available in all governorates at all the levels of sampling. Absence of samples is indicated by dashes (---).

# V

# STATUS OF SEED INDUSTRY COMPONENTS

## INFRASTRUCTURE

The present seed industry includes most--not all--of the requisite infrastructural components; however, it is not effectively equipped, staffed, organized, funded and integrated; it is a number of agencies, operations and activities whose coordination and performance depends more on individuals than on systematic functioning. Established goals have been met as to quantities of seed. Problems are quality assurance and control, processing efficiency and effectiveness, marketing/promotion, and distribution. These problems are at least partly the result of the high priority given to meeting quantitative targets.

A technical function-oriented overview/summary of performance and participation of various agencies in essential seed industry components is shown below; more details are included in later sections.

POLICY-SETTING: Not organized; policies set by the Ministry of Agriculture & Land Reclamation in response to problem situations. Definitive long-term development-oriented policy appears lacking.

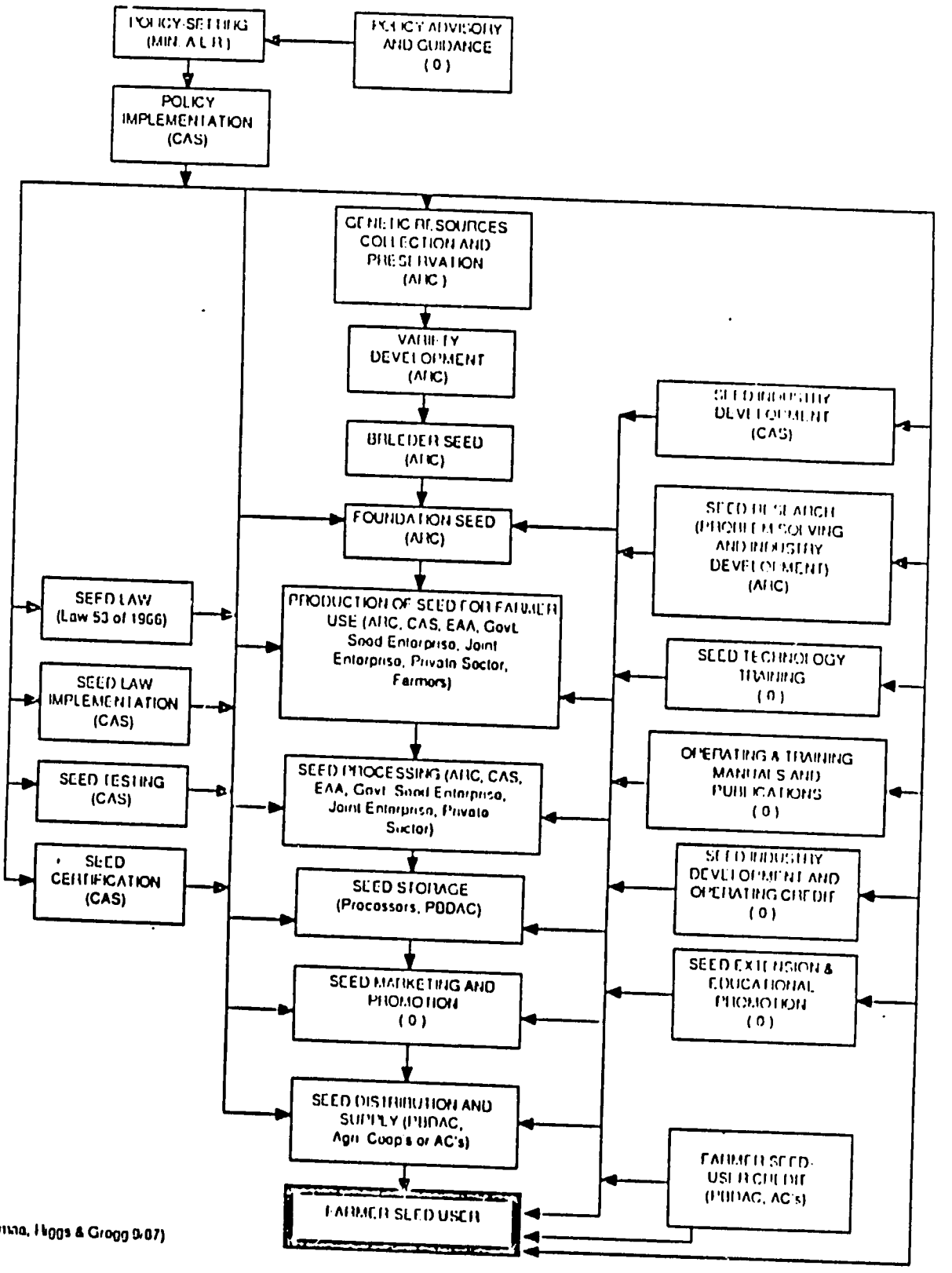
POLICY GUIDANCE: No official committee/council/board guides policy, advances government/private sector/farmer-user/industry needs, coordinates needs/actions, integrates seed into overall agricultural development, develops policy recommendations and long-range needs for Ministerial consideration.

POLICY IMPLEMENTATION: Not organized; the Central Administration for Seed (CAS) implements what amounts to Ministry policy for seed, and also implements many seed industry activities.

PROMOTING SEED INDUSTRY DEVELOPMENT: No organized official effort; through personal dedication, CAS leadership has assumed this role. Support is excellent from key individuals; however, this may change if individuals in key positions change; to risk major long-term investments, the private sector needs formally-stated, official long-term support.

SEED LAW: Several Laws affecting seed have been enacted; current is Law 53 of 1966. This law is considered by CAS seed specialists to be weak in the seed area, in that it does not adequately provide for certification and its attendant field supervision and inspection; it relies largely on seed testing. Consequently, seed program guidance and seed varietal purity are weak.

# OPERATING & INTENDED EGYPTIAN SEED SUPPLY INFRASTRUCTURE




(Cossa, Higgs & Gregg 9/87)

SEED LAW IMPLEMENTATION: Not efficiently organized, complete, funded, equipped, or staffed; primarily through seed testing, CAS implements the Law's quality-control measures, but does not inspect seed "in commerce"; seed field inspection has been improved, but needs further upgrading.

GENETIC RESOURCES COLLECTION & PRESERVATION: ARC FCRI's Germ Plasm unit has beeen established, but is not complete enough to operate. Organization, staff, records, reports, budgets, equipment, facilities, and operations need to be upgraded.

SEED RESEARCH: ARC's problem-solving and industry-development research is just beginning. An excellent base was established under EMCIP, but it still needs equipment, specially-trained personnel, and guidance toward problem-solving and industry-development research.

VARIETY DEVELOPMENT: ARC, through its Research Institutes and Research Stations, has an excellent research and variety development base. More operating funds and in some cases equipment and supplies are required for it to be fully effective.

VARIETY RELEASE: ARC handles variety release and recommendation. Needed are more formal procedures with inputs and evaluation from a wider base.

BREEDER SEED: ARC provides Breeder seed, but needs an organized program to handle operations efficiently, with facilities for medium- and long-term seed storage/preservation.

FOUNDATION SEED: ARC, through some Research Institutes, provides basic seedstocks, but quality and quantity still need improvement; more storage (including some medium-term seed security storage) and processing facilities are required, along with specially-trained and assigned personnel and a centrally-organized infrastructure, policy and procedures.

PRODUCTION OF SEED FOR FARMER USE: Many agencies are involved in a system which lacks coordination and organization; some agencies provide specific services and do certain work for others. Seed is produced, on controlled farms or by contract farmers, under the aegis of ARC, CAS, Egyptian Agricultural Authority (EAA), private seed firms, Government Enterprise Seed Firm, and a Joint Government/ Private Sector Seed Firm; individual farmers save/trade untested "farm-gate" seed.

SEED PROCESSING: One of the most poorly-equipped, trained, staffed, and organized aspects of the seed supply infrastructure. Several agencies process seed; in some cases, one agency owns plants but operates them for, or rents them to, other agencies. Equipment is inadequate and generally

-73-

outmoded and in poor condition; personnel is poorly trained; processing sequences are incomplete; individual machines needed for required separations for certain crop seed are lacking; location and number of plants are inadequate; plants are overloaded, with no flexibility to increase output, improve seed quality, or add new seed crops. Agencies involved include CAS, EAA, 3 private-sector firms (CAS, ARC, etc., process seed for other private firms), Egyptian General Agricultural Cooperatives (EGCA), Government Enterprise Seed Firm, and Joint Government/Private Sector Seed Firm.

SEED STORAGE: Seed storages are old, in poor condition and/or poorly-designed and not in conformance with basic technical principles of design and construction to maintain seed quality and permit low-cost operating efficiency. This includes the latest storage structures erected; there is no known technically-adequate storage for short-, medium-, or long-term storage of seed for farmer use, multiplication stocks, or seed security stocks. Seed storage is conducted by seed processing agencies and Principal Bank for Development & Agricultural Credit (PBDAC).

SEED CERTIFICATION & FIELD INSPECTION: Field inspection, grower guidance/supervision, and certification work is severely limited by lack of adequate technical training for inspectors, inadequate operating budgets, lack of transport, and lack of legal/administrative/implementational definition of responsibilities. CAS, assisted by ARC specialists, makes field inspections during the last few years, but inspections sometimes are still inadequate.

SEED TESTING SERVICES: All seed testing is done in 3 outmoded, old, poorly-equipped labs operated by CAS. These labs are hampered by inadequate technical training for staff, outdated operating procedures, and poor facilities. Cost-effectiveness is low; testing time required is reported to average 20 days; repeatibility and uniformity of test results are poor.

INTERNAL QUALITY-CONTROL SYSTEMS: No agency, government or private sector, except CAS has operating internal quality control systems. All private-sector and government seed producers/processors rely on CAS for these services, while CAS itself has inadequate technically-trained staff, transport, and budget to provide suitable services.

PRIVATE SECTOR: Key individuals in Government recognize the importance of private-sector participation, and have provided outstanding support to private-sector development. However, this support is not officially spelled out so that all interested parties can obtain it and depend upon its continuance through the long-term to justify long-term investment. Current private-sector seed operations include Egypt Seeds (maize), National Seeds (maize), and several operations handling berseem clover and vegetable seed.

JOINT GOVERNMENT/PRIVATE-SECTOR SEED FIRM: To encourage participation by private seed firms which have the technology to help Egyptian agricultural development, the government has begun to "go into partnership" with private firms; this resulted in formation of Misr Pioneer (maize, sorghum).

GOVERNMENT SEED ENTERPRISE: A government-owned company was formed to produce special seed crops: Nubaria Seed Co. (vegetable seed production in reclaimed areas).

MARKETING, SALES, SEED AWARENESS PROMOTION: No marketing/ promotion is done; i.e., no agency conducts educational promotion to develop farmer demand for, and desire to use, improved seed.

TRANSPORT: Seed quality may be damaged due to chemicals, temperature, etc., during transport; bags are torn by improver handling. No specialized vans or equipment/facilities are used. Seed is largely transported by PBDAC, using public transport.

DISTRIBUTION & SUPPLY: All seed is distributed through the farm production credit system under PBDAC and the agricultural cooperatives which work with it.

EDUCATIONAL EXTENSION PROMOTION OF FARMER "SEED AWARENESS": No organized educational/ extension work is done to promote farmer "seed awareness". In the long-run, farmers are not being educated to realize the value of improved seed.

FARMER SEED-USER CREDIT: PBDAC and the Agri. Cooperatives which work with it provide seed-purchase credit; farmers are often required to take seed to get other credit, as opposed to suppliers responding to farmer demand for seed.

SEED INDUSTRY DEVELOPMENT & OPERATING CREDIT: Standard credit sources; no special credit provision is generally available. However, special credit was made available to establish the joint government/private-sector seed firm.

SEED TECHNOLOGY TRAINING & TRAINED PERSONNEL: No agency in Egypt provides Seed Technology training; funds are not available for overseas training. Government has no pool of trained personnel to handle its operations and for the private sector to draw upon; no training is available for private-sector personnel.

TECHNICAL, OPERATING, MAINTENANCE, TRAINING PUBLICATIONS: No agency produces, supplies, or translates useful technical training and operating manuals/guides; only limited copies of special course proceedings (ICARDA, EMCIP) have been printed.

EQUIPMENT, SPARE PARTS & SUPPLIES: There is no regular or organized domestic source or supply system to provide the needs of the seed industry; each need is handled as a separate case. International Development Assistance Donors ( e.g., USAID in EMCIP); private firms import on special order.

CONSTRAINTS & NEEDS: The seed industry currently suffers from fragmented organization. Assignment of tasks is not always clear, and accountability and authority do not always coincide with what is assigned. Resources and responsibilities for public-sector operations are scattered among several agencies, with inadequate provision for cooperation and coordination. Facilities, equipment, and staff technical training are inadequate.

**POLICY**

While technical aspects--facilities and training--are in urgent need of improvement, policy issues also require examination. Some general agricultural policies such as price controls and delivery quotas have a direct impact on the seed industry, and specific policies such as prices paid to seed producers and/or charged to seed users are of concern.

Government policy must promote efficient management and coordination of seed industry components, as both public and private sectors can fulfill important roles. Government policy should provide the appropriate institutional infrastructure for a seed industry to flourish, and maintain complementary and supporting activities normally provided by government to the private sector. Policies discriminating against the private sector, in roles it can fulfill, should be avoided. Regulations on private sales, such as Certification or the Seed Law--should be administered accurately and without unnecessary delay.

Investment in the seed industry must be properly balanced. There is no benefit of investing heavily in one component if others are neglected or if improved varieties do not offer substantial benefits to farmers. Proper balance of the various essential components requires conscious guidance through enlightened government policy.

Efficient implementation of seed supply also requires effective organization, as well as coordination between farmer demand/need and seed

industry components ranging from variety release to seed distribution. The seed supply system must be responsive to farmer needs.

Social objectives are not always identical to private-sector objectives, as the private sector must seek a return on its investment. Policy can be used to balance private interests with social interests while maintaining the advantages of private-sector participation.

POLICY ON FARMER SEED-USERS: Current seed policy of the Ministry of Agriculture and Land Reclamation (MOA) is to supply to farmers, through the crop credit system, seed of the best possible quality but more imprtantly in amounts sufficient to plant:

100% of seed required for cotton, soybean, and onion (replacement each season).

50% of seed required for wheat, rice, faba bean, lentil, peanut, and barley (replacement every 2nd season).

50% of maize seed was supplied previously, but in 1980/81 government suspended its production of maize seed and established a policy to delegate this to the private sector; CAS now produces only the equivalent of Foundation seed of maize.

POLICY ON PRIVATE SECTOR SEED SUPPLY: Implementation of policies favorable for private-sector participation has resulted in emergence of several private seed companies. However, policy issues need to be formalized in a manner which ensures long-term application so as to attract long-term investment by the private sector.

CONSTRAINTS & NEEDS:

1. FARMER SEED SUPPLY: Policy has stressed quantity at the expense of quality; policy should be changed to stress quality which is high enough to deliver research-developed improved technologies, and to provide the support and farmer demand which will enable the seed industry to function effectively to implement government's policy.

2. PRIVATE-SECTOR PARTICIPATION: Significant activities at the policy-level are implemented, but serious formalization of policy is needed. Policy on private-sector participation has not been formalized. Some uncertainties still exist in relation to continuity of policy with respect to unimpeded private-sector participation and government support. However, in-effect and stated policy is for the government to support private sector seed operations to the maximum, including assistance in establishing operations, credit, personnel, processing/handling of seed, etc. Government will also reduce or stop production of seed which the private sector supplies.

   Needed is a formal policy which remains in force for the long-term to provide assured, detailed and specific cooperation with and support to private-sector participation, defines the roles assigned to the private sector, and guarantees against government competition and sudden changes in policy.

## POLICY GUIDANCE

A specific policy advisory/guidance body, as has been most useful in many other countries, is needed. Several informal approaches have been used, but these lack the completeness required to attract, support, and maintain adequate balanced and complete seed industry operations.

CONSTRAINTS & NEEDS: Some deficiencies/problems in the seed system are due to lack of a high-level, effective national seed advisory board to identify overall needs and formulate and recommend an appropriate framework of policies for development, operation and control of the seed industry; to determine most appropriate responsibilities for various components; and advise/guide modernizing and maintaining the seed industry. In the absence of a special body to advise, coordinate and guide national seed

policy, policy becomes a response to current problems rather than a far-seeing guide to develop the industry and its components toward long-term goals while fulfilling current needs. A formal national-level policy-guidance body with wide representation would help rationalize support to, and operation of, the seed supply.

## POLICY IMPLEMENTATION

The CAS is responsible for implementing most of the government's seed policy, although ARC and other agencies implement certain aspects.

CONSTRAINTS & NEEDS: Policy implementation is not organized and formalized, as formulation of seed policy. The needed formalization of national seed policy should include specifying roles of CAS and other government agencies as well as the private sector in terms of industry infrastructural activities, and should be followed by specific organization and approaches by CAS as the implementation leader.

## PROMOTING SEED INDUSTRY DEVELOPMENT

The supporting activities required by a seed supply industry necessitate government participation and intervention. Government must provide a wide range of services from quality control standards to supporting operations to create an agro-economic environment in which the private sector can effectively operate.

There is initial and continuing need for government leadership in establishing seed industry operations, maintaining essential support/guidance/control activities, etc. Also, production and supply of certain crop seed must be handled by the public sector for some time to come, as these will not be feasible for the private sector. The role of government is also to establish pilot operations to demonstrate the need, what is required to supply the need, and what will work (or will not work) under local conditions.

In effect, Government must create a favorable environment in which the seed industry and its private-sector components can function, and provide support where needed. Only through such enlightened support and development can a private-sector seed production/supply system develop, and farmers receive the high-quality seed required to maximize agricultural production.

CONSTRAINTS & NEEDS: Development of the seed industry and private sector is promoted, but in an informal manner which depends heavily on personal support rather than dependable, on-going organized government approaches. Government policy should be formalized, and specific

support/promotion efforts spelled out in a form which makes them apply over the long-term, so that long-range investment can safely be made in the seed industry. The CAS should establish, with Ministerial approval as required, a special Seed Industry Development Office, in the office of the Under-Secretary of the CAS.

**SEED LAW**

The seed industry should operate under legislation designed to guide the seed supply in the best interests of the nation's agriculture, by requiring quality standards which are economically possible for seed producers to achieve, and at the same time ensure that seed purchased by farmers is of the desired variety, germination and purity.

Egypt has a structure and background of seed legislation which is substantial and of long standing. The structure, development and major concerns of the seed legislation have been strongly influenced by the cotton crop. Evolution from the cotton seed department established in 1922 to today's CAS responsible for most major crop seed was accompanied by a series of laws and associated Ministerial decrees, including a law in 1926 regulating cotton seed production and trade, a 1946 decree promoting seed production of major field crops, a 1957 law regulating seed testing and labeling, and a 1960 law pertaining to "Certified" seed production of most major crops. All previous legislation was revised and incorporated into Law No. 53 of 1966, the current legislation.

Law 53 of 1966 re-organized and regulated production and distribution of seed of all field and vegetable crops. The Ministry of Agriculture has statutory responsibility for establishment, operation and control of the seed industry.

As reviewed by the Winrock International/USAID Study Team, the current Seed Law is an all-inclusive Agricultural Act. Chapter I deals with organization of crop production; Chapter II covers registration of crop varieties; Chapter III deals with seed production and supply.

Chapter III (the seed component) and Ministerial decrees issued thereunder designate areas where certain crop varieties (primarily cotton) can be grown, specify crop rotations to be used, establish a cotton seed Certification system, specify seed testing procedures, regulate construction and operation of processing facilities, and control seed import and export.

The Law and associated decrees regulate both field and vegetable crop seed. It is similar to traditional seed laws in developed countries except for provisions for cotton seed, crop rotation, and concentrating seed production

in certain areas. The Certification system and seed testing procedures on paper are similar to those in most developed countries.

CONSTRAINTS & NEEDS: CAS seed specialists advise that the Law does not specifically establish seed Certification except for cotton, and therefore does not establish adequate field standards for seed crops or inspection of seed fields, which results in low genetic (varietal) purity of seed. Poor implementation also limits the Law's usefulness; funds, equipment, transport, facilities, and staff training are inadequate to permit adequate inspection and implementation; even if the Law were properly implemented through an adequate inspection program, existing seed testing facilities could not handle the resulting workload.

## SEED LAW IMPLEMENTATION

CAS is responsible for implementing the Seed Law. CAS has inadequate resources and its personnel has not received adequate up-to-date technological training to permit administering the Law adequately; it is unrealistic to expect full implementation without the necessary resources. As much as possible is done through seed sampling and testing; however, if the Law were administered at the levels normally considered essential, the seed testing laboratories would be unable to handle the workload.

CONSTRAINTS & NEEDS: The Winrock/USAID Report states that "Implementation of the Seed Law has been erratic and its intent has often not been achieved. Many problems confronting seed industry development are results of failures to fulfill the Law's purposes, intent and provisions. These failures in turn can be attributed in major part to an array of deficiencies in resources, methodologies, expertise, organization, and to economic policies that control production, pricing, and subsidies".

## GENETIC RESOURCES: COLLECTION & PRESERVATION

VALUE: Without ample collection, storage and preservation of genetic materials carried by seed, there can be no effective national production, no national wealth, no future for a nation. Seed are many things, but above all else, they carry the genetic traits that ensure survival--and improvement--of species.

Survival of species and genetic variability is especially significant in plant evolution; plants with the proper combinations of gentic factors have the maximum opportunity to survive. Genetic variability is also the basis for manmade improvement of a crop species to adapt it for specific uses for food, feed or fiber.

Some areas have been cultivated for centuries, growing old landraces of balady crops. Even if their yields are low, these strains constitute a valuable germ plasm resource that can be genetically exploited to increase productivity of modern crop varieties. Furthermore, many balady landraces evolved and adapted to inhospitable environments, because of their genetic make-up. This environmental "selection pressure" produced plants with highly-desirable traits such as resistance to disease/insects/pests, tolerance to salinity/drought/heat, etc. This resource of genetic traits--the balady landraces--can be used to improve present cultivars or produce new, higher-yielding, better-adapted cultivars.

Genetic diversity--irreplaceable germplasm--of old landraces is fast-disappearing due to introduction of new cultivars which replace them and cause them to be dropped out of production. The loss is aggravated by changing land-use patterns, land reclamation, improved transport and release of new and improved cultivars.

Recent severe disease outbreakss and insect infestations make it extremely important that all landraces which show genetic diversity be collected and saved, both in Egypt and worldwide. There is an urgent need to collect, preserve and utilize this national treasure--Egypt's balady crop lines.

CURRENT SITUATION: A Genetic Resources Section has been initiated by ARC at the Bahtim Research Station, to collect and preserve seed of landraces of balady and varieties of modern field and horticultural crops, under an agreement between the Government's Agricultural Research Center's Field Crops Research Institute and Horticultural Research Institute, and the International Board of Plant Genetic Resources (IBPGR).

ARC has made an excellent beginning by establishing the FCRI Genetic Resources Section, which has established a germ plasm bank. Various units of the FCRI and HCRI have cooperated with IBPGR in domestic collecting/survey trips for several crops, but these materials are not stored in Egypt.

CONSTRAINTS & NEEDS: The Genetic Resources Section has been established; the basic facility is in place, but needs considerable additional resources to be adequately-equipped and capable of operating sufficiently to fulfill its mandate. It needs more equipment, improved facilities, more staff, staff training, organization, integration into the overall ARC research system, and overall long-range planning of operations (perhaps through an advisory committee of ARC research administrators). Much remains to be done to set up the facilities and operations and begin to collect, maintain, catalog and supply the genetic resources needed to support effective crop breeding research. Collecting and maintaining more materials, comprehensive cataloging/reporting systems, and close overall coordination/integration into ARC research are needed.

Operations of the ARC FCRI Genetic Resources Section need to be strengthened with staff training, equipment, facilities, organization and budget. It must be capable of maintaining an effective stock of germ plasm, issuing useful catalogs/descriptions, and operating as part of the overall ARC research system both as a source of germ plasm for breeding research and as a repository of varietal and select breeding materials. A special ARC committee should be formed to study means of integrating the Genetic Resources facilities with medium- and long-term maintenance of Breeder seed. NARP should improve this facility by:

1. Completing the genetic resources preservation infrastructure.

2. Equipping laboratories and storages for safe seed storage.

3. Conducting collection missions to identify, collect, and preserve germ plasm.

4. Preserving collected germ plasm, through seed, under controlled environmental conditions.

5. Monitoring germinability and storability to maintain viability.

6. Multiplying and systematically evaluating/cataloging the collected materials, to identify traits useful to plant breeders.

7. Documenting origin, evaluation, storage quality, etc., of all stored lines.

8. Developing a computer data base.

9. Providing training for professional and support staff.

10. Continuing operations to systematically improve the collection and maintain complete germ plasm bases of all crops and potentially-useful wild/native species.

11. Maintaining close links with IBPGR and other germ plasm collections.

12. Disseminating seed and descriptive data to researchers to enhance the production of new cultivars.

**SEED RESEARCH**

ARC established an excellent seed research facility in FCRI, under the EMCIP project. However, this unit was not fully-equipped, and has not been adequately staffed with properly-trained seed researchers/technologists. It also needs an advisory committee to help focus research efforts on problem-solving and industry development needs.

CONSTRAINTS & NEEDS: Currently, a constraint to seed industry development is inadequate applied research capability to identify the causes of seed quality problems and devise appropriate solutions. The FCRI Seed Research Section urgently needs a considerable amount of equipment; more seed technologists who have received in-depth professional seed technology training (as opposed to crop or vegetable training); integration into the overall ARC system so that it can maintain contact with all ongoing crop-oriented research; close coordination with the FCRI Genetic Resources Section, and a Research Advisory Committee with broad representation to help maintain research focus not on academic efforts but on currently-needed problem-solving and industry-development research. These need to be remedied as soon as possible.

**VARIETY DEVELOPMENT**

Crop breeding research and development of improved varieties form the base of the seed industry--which exists only to take newly-developed

genetic materials and technologies from research to farmers. Crop breeding research is usually conducted by public-sector organizations; private-sector research is usually confined to hybrid crops whose seed must be replaced each season so the firm can produce or control all seed each year and recover its investment through charging for seed.

ARC has primary responsibility for research in breeding, introduction, and testing of new and/or improved crops and varieties. The principal research arm of the Ministry of Agriculture and Land Reclamation, ARC has some 19,000 employees, including nearly 700 Ph.D.'s. Programs are organized on a commodity/service basis into 16 subsidiary Research Institutes, which are generally well-staffed; for example, FCRI has 73 Ph.D.'s and 141 M.S.'s. Major food and feed crops are in the Field Crops Research Institute (FCRI): maize, wheat, rice, sorghum, barley, faba bean, soybean, lentil, berseem and other forage crops. Vegetable and fruit crops are handled by the Horticultural Crops Research Institute (HCRI).

ARC and its Research Institutes are based in Giza/Cairo, but research is also conducted at Research Stations located throughout the country on land operated by State Farms which do farming operations including land assignment, land preparation, cultivation and harvest, for the Research Stations.

Under ARC's ongoing program and special projects, improved varieties have been developed for all major crops, to fit different ecological zones. More improved varieties are constantly in development (Table 11).

Crop variety improvement objectives are primarily related to plant type, stature, and yield. Land is limited and population is growing rapidly, so primary emphasis is on yield increase, with attention to yield stability to prevent gains made from eroding under disease, pest and environmental stress.

In addition to ARC, the Food & Agriculture Council of the Academy of Scientific Research and Technology, the National Research Center, and 14 university Faculties of Agriculture have limited involvement in agricultural research and crop improvement.

TABLE 11
FIELD & HORTICULTURAL CROPS FOR WHICH ARC MAINTAINS RESEARCH PROGRAMS WHICH DEVELOP IMPROVED VARIETIES
(Source: ARC, 1987)

| CROP | VARIETY-DEVELOPING UNIT | |
|---|---|---|
| | INSTITUTE | SECTION |
| Artichoke | HCRI | Veg. Prop. Crops |
| Barley | FCRI | Barley |
| Bean, broad (faba) | FCRI | Food Legumes |
| Bean, green (string) | HCRI | Self-Poll. Crops |
| Bean, dried | HCRI | Self-Poll. Crops |
| Beet, garden | HCRI | Cross-Poll. Crops |
| Cabbage | HCRI | Cross-Poll. Crops |
| Carrot | HCRI | Cross-Poll. Crops |
| Cauliflower | HCRI | Cross-Poll. Crops |
| Chickpea | HCRI | Food Legumes |
| Clover, berseem | FCRI | Forage Crops |
| Cotton | CRI | |
| Cowpea | HCRI | Self-Poll. Crops |
| Cucumber | HCRI | Cross-Poll. Crops |
| Eggplant | HCRI | Self-Poll. Crops |

| CROP | VARIETY-DEVELOPING UNIT | |
|---|---|---|
| | INSTITUTE | SECTION |
| Fenugreek | FCRI | Food Legumes |
| Garlic | HCRI | Veg. Prop. Crops |
| Jute | | |
| Lentil | FCRI | Food Legumes |
| Lettuce | HCRI | Cross-Poll. Crops |
| Lupines | FCRI | Food Legumes |
| Maize | FCRI | Maize |
| Mallow | HCRI | Cross-Poll. Crops |
| Melon & cantaloupe | HCRI | Cross-Poll. Crops |
| Okra | HCRI | Cross-Poll. Crops |
| Onion | FCRI | Onion |
| Pea | HCRI | Self-Poll. Crops |
| Groundnut | FCRI | Oil Crops |
| Pepper | HCRI | Self-Poll. Crops |
| Potato | HCRI | Veg. Prop. Crops |
| Radish | HCRI | Cross-Poll. Crops |
| Rice | FCRI | Rice |
| Sesame | FCRI | Oil Crops |
| Sorghum | FCRI | Sorghum |
| Soybean | FCRI | Food Legumes |
| Spinach | HCRI | Cross-Poll. Crops |
| Squash | HCRI | Cross-Poll. Crops |
| Sugarbeet | SCRI | |
| Tomato | HCRI | Self-Poll. Crops |
| Turnip | HCRI | Cross-Poll. Crops |
| Watermelon | HCRI | Cross-Poll. Crops |
| Wheat | FCRI | Wheat |

CONSTRAINTS & NEEDS: Although ARC's capabilities and productivity are still limited by constraints such as low salaries, limited operating budgets and lack of some equipment/facilities, substantial improvements have been made since 1980, especially in the FCRI and related Institutes which undergird the seed industry. While State Farm responsibility for land and farming operations has advantages, it causes shifting of lands assigned to research, which makes it difficult to develop research lands adequately, and sometimes does not result in best conditions for long-term research.

A steady stream of improved varieties has been developed by ARC; these could have a significant impact on national agricultural productivity and cost-efficiency if they could be delivered uncontaminated to farmers in general. This, however, is a major constraint: due to inadequate supply of improved seed of high genetic purity, the results of ARC's variety development research has not reached farmers and has not had its full potential influence on national production.

Significant amounts of the researchers' time and effort are spent on the mechanics of producing/supplying Breeder and Foundation seed; this time and effort would be of much more benefit if it were spent on research. To relieve researchers of this unnecessary burden, a central unit for producing Breeder and Foundation seed--under supervision of researchers--should be established.

## VARIETY RELEASE

Accelerated, appropriate crop research which influences national crop productivity depends upon regular release of improved genetic materials as improved varieties. Organized variety release, to meet agricultural conditions and transfer better technologies to farmers, requires establishing and implementing a standardized and stable variety release/withdrawal procedure which ensures that agricultural needs are served, varieties are properly tested--but not delayed--before they are released, and that obsolete varieties are removed and replaced.

In the early 1970's, ARC variety release was formally handled by a committee, but these procedures were not generally followed after the mid-1970's. Currently, the head of the relevant unit within the concerned ARC Research Institute decides which advanced lines will be mutiplied and released as varieties. Current thinking, and to some extent practice, is that release of new varieties should be formalized: research data on performance and adaptability should be presented to an ARC "Variety Release & Review Committee". This Committee would review presentations and recommend release of candidate varieties and/or withdrawal of obsolete varieties to the ARC Director, who should authorize release/withdrawal

CONSTRAINTS & NEEDS: Lack of a realistic, production-oriented, progressive, and uniform system for introducing/releasing new varieties and discarding obsolete varieties is a constraint. A Variety Release & Review Committee should be established to study and evaluate data and recommend variety release or removal to the ARC Director. The Committee should include primarily research specialists, but should also include representatives of extension, planning, credit and farmer organizations.

## BREEDER SEED & VARIETY MAINTENANCE

ARC is responsible for variety maintenance and Breeder seed production, which are normally functions of crop breeding/research programs.

Essentially similar to those used in other countries, variety maintenance and Breeder seed increase/production procedures for self-pollinated cereal crops are technologically appropriate and can adequately support development and re-organization of the seed industry. Head-to-row procedures under direct supervision of a qualified breeder are used; seed from retained rows are bulked for initial increase under rigorous roguing; seed from this increase are then planted to produce Breeder seed which is used to produce Foundation seed.

The re-organization of State Farms set aside permanent areas for research, and exempted them from the crop rotation scheme; this siginificantly improved potential efficiency. Equipment for plowing, cultivation, plant protection, land improvement and harvest was made available to the Research Stations under EMCIP and RRT projects. Research lands--including land for variety maintenance, Breeder seed and some Foundation seed--are now mandated to, and operated by, the Research Stations. Table 12 shows crops/varieties maintained as Breeder seed.

TABLE 12
CROP VARIETIES MAINTAINED BY ARC IN BREEDER SEED FORM
(Source: ARC & CAS, 1987)

| CROP | NO. OF VARIETIES MAINTAINED | UNIT WHICH MAINTAINS BREEDER SEED |
|---|---|---|
| Artichoke | 1 | HCRI Veg. Prop. Crops |
| Barley | 5 | FCRI Barley |
| Bean, broad (faba) | 3 | FCRI Food Legume |
| Bean, green (string) | 3 | HCRI Self-Poll. Crops |
| Bean, dried | 3 | HCRI Self-Poll. Crops |
| Beet, garden | 3 | HCRI Cross-Poll. Crops |
| Cabbage | 2 | HCRI Cross-Poll. Crops |
| Carrot | 3 | HCRI Cross-Poll. Crops |
| Cauliflower | 3 | HCRI Cross-Poll. Crops |
| Chickpea | 3 | FCRI Food Legumes |
| Clover, berseem | 4 | FCRI Forage Crops |
| Cotton | 9 | CRI |
| Cowpea | 2 | HCRI Self-Poll. Crops |
| Cucumber | 9 | HCRI Cross-Poll. Crops |
| Eggplant | 3 | HCRI Self-Poll. Crops |
| Fenugreek | 1 | FCRI Food Legumes |
| Garlic | 2 | HCRI Veg. Prop. Crops |
| Jute | | |
| Lentil | 2 | FCRI Food Legumes |
| Lettuce | 3 | HCRI Cross-Poll. Crops |
| Lupines | 2 | FCRI Food Legumes |
| Maize | 8 | FCRI Maize |
| Mallow | 1 | HCRI Cross-Poll. Crops |
| Melon & cantaloupe | 8 | HCRI Cross-Poll. Crops |
| Okra | 4 | HCRI Cross-Poll. Crops |

| CROP | NO. OF VARIETIES MAINTAINED | UNIT WHICH MAINTAINS BREEDER SEED |
|---|---|---|
| Onion | 3 | FCRI Onion |
| Pea | 5 | HCRI Self-Poll. Crops |
| Groundnut | 2 | FCRI Oil Crops |
| Pepper | 3 | HCRI Self-Poll. Crops |
| Potato | 18 | HCRI Veg. Prop. Crops |
| Radish | 2 | HCRI Cross-Poll. Crops |
| Rice | 5 | FCRI Rice |
| Sesame | 2 | FCRI Oil Crops |
| Sorghum | 3 | FCRI Sorghum |
| Soybean | 2 | FCRI Food Legumes |
| Spinach | 4 | HCRI Cross-Poll. Crops |
| Squash | 1 | HCRI Cross-Poll. Crops |
| Sugarbeet | 7 | SCRI |
| Tomato | 8 | HCRI Self-Poll. Crops |
| Turnip | 2 | HCRI Cross-Poll. Crops |
| Watermelon | 8 | HCRI Cross-Poll. Crops |
| Wheat | 7 | FCRI Wheat |

CONSTRAINTS & NEEDS: Deficiencies in facilities and equipment exist, but can be corrected if adequate funding can be provided. Adequate cleaning facilities (suitable for the smaller quantities usually maintained as Breeder seed) and long-term storage facilities (several separate rooms) are needed at several Research Stations to ensure security stocks of Breeder seed, provide adequate seed for emergencies, ensure timely delivery and availability, reduce production costs, and improve supply. An ARC Breeder Seed Advisory Committee should be established to provide guidance in kinds and amounts of seed to produce. The mechanics of Breeder seed production should be handled by the special Foundation seed section, under close guidance from the researchers/breeders.

## SEED PRODUCTION

"Seed industry" operations begin at the Foundation seed stage. On paper, seed production is organized in a straightforward manner; however, in practice it is often complex, with several public agencies and private firms and persons involved.

Foundation seed is produced by ARC. In the absence of a private sector, most organized seed supply is handled by government agencies, primarily the Central Administration for Seed (CAS) in the Ministry of Agriculture and Land Reclamation. The CAS produces seed of field crops (except corn), cotton, and vegetables. The private sector has been given responsibility to supply seed of corn, most vegetables and clover, and some seed of other crops.

A major part of the seed of some crops is still grown and exchanged by local farmers. This "farm-gate seed" constitutes a major constraint to increased use of improved varieties to increase crop yields.

CONSTRAINTS & NEEDS: Although comparison of government seed policy and actual production shows that quantity targets (except for maize) have been met or exceeded (see Table 8), many problems and constraints are encountered. Many arise from organizational deficiencies and complexities, especially fragmentation/dispersion of operations and responsibilities among different agencies, and lack of adequate facilities and staff technical training. As an example of the results of such problems, in 1980-85 the area in wheat and rice seed production expanded dramatically, but at the same time, output of Certified seed declined. Seed production now uses more land and costs much more than is necessary, while seed quality is not maintained. Facilities for processing/handling/storing seed are inadequate, badly worn, not in all needed locations, and dispersed among different agencies.

Lack of adequate technical and managerial training for personnel is a serious constraint. Training is needed at all levels: farmer contract seed growers, State Farm and Research Station staff, CAS supervisory and inspection staff, PBDAC personnel, etc.

Seed quality has also not been sufficient to transfer research technology adequately to farmers.

## PLANNING SEED PRODUCTION

CAS is responsible for planning seed production. It determines the amounts of seed needed to implement government production plans, and then seeks to arrange production of the required seed.

CONSTRAINTS & NEEDS: The amount of seed specified in crop production credit package schemes is not always considered adequate by farmers, although excessively high planting rates are often used; an allowance should be made for varying seed amounts and, more suitably, farmers educated in planting requirements and methods. Also, there is no organized allowance for excess or "security" seed stocks to meet unexpected needs; CAS production facilities and staff are already overloaded to the maximum. However, even if security stocks could be produced, there are presently no safe facilities for carryover storage. Not only is there urgent need for analysis and evaluation of appropriate organization of and participation in the seed production system, but in-depth technical (as opposed to superficial or economics-oriented) analysis of available facilities, staff training, and supporting services needs to be made, and deficiencies remedied on a priority basis.

## SEED QUALITY

The general tendency of the MOA and the seed industry has been to stress quantity at the expense of quality, probably due to the need to supply at least some kind of seed to farmers who have no other suitable seed source.

CONSTRAINTS & NEEDS: "Key officials and experts repeatedly identify the seed industry as a critical bottleneck in transferring to farmers the potential benefits of new research-developed agricultural technology. The over-riding concern is seed quality--including germination, varietal purity, and freedom from weed seed and other foreign material" (Winrock/USAID).

## SEED STANDARDS

Seed quality standards (Table 13) for Foundation, Registered, Certified and commercial seed were established by Ministerial decree under Law 53

of 1966, and are implemented by CAS on seed produced under the Certification program.

TABLE 13
QUALITY STANDARDS FOR SEED OF FIELD CROPS & VEGETABLES
(Law 53 of 1966 & decrees thereunder)

| CROP | GERM. (min. %) | PURITY (%) | | | OFFTYPES (max. %) | | | |
|---|---|---|---|---|---|---|---|---|
| | | PS | OC | WS | FDTN | REG | CERT | COML |
| Alfalfa | 85 | 90 | 0.5 | 1.5 | | | | |
| Anise | 50 | 85 | | | | | | |
| Barley | 85 | 93 | 0.5 | 1.0 | 0.1 | 0.5 | 2.0 | 5.0 |
| Beans | 85 | 93 | 0.3 | 1.5 | | | | |
| Bean, broad | 70 | 95 | | | 0.1 | 0.5 | 2.0 | 5.0 |
| Bean, faba | 85 | 93 | 0.3 | 1.5 | | | | |
| Bean, green | 70 | 95 | | | 0.1 | 0.5 | 1.0 | 2.0 |
| Beet | 50 | 90 | | | | | | |
| Cabbage | 70 | 93 | | | | | | |
| Carrot | 50 | 85 | | | | | | |
| Castor bean | 75 | 95 | | | | | | |
| Cauliflower | 60 | 93 | | | | | | |
| Celery | 50 | 85 | | | | | | |
| Chard | 50 | 90 | | | | | | |
| Chickpea | 85 | 90 | 0.5 | 0.5 | | | | |
| Clover, berseem | 85 | 90 | 1.0 | 1.5 | 0.1 | 0.5 | 2.0 | 3.0 |
| Cotton* | | | | | | | | |
| Cowpea | 70 | 93 | | | 0.1 | 0.5 | 1.0 | 2.0 |
| Cucumber | 60 | 92 | | | | | | |
| Cucumber, Egyptian | 60 | 92 | | | | | | |

| CROP | GERM. (min. %) | PURITY (%) PS | OC | WS | OFFTYPES (max. %) FDTN | REG | CERT | COML |
|---|---|---|---|---|---|---|---|---|
| Cumin | 50 | 85 | | | | | | |
| Dill | 50 | 85 | | | | | | |
| Eggplant | 60 | 95 | | | | | | |
| Endive | 50 | 90 | | | | | | |
| Fenugreek | 85 | 90 | 0.5 | 0.5 | | | | |
| Flax | 80 | 90 | 0.5 | 1.0 | 0.1 | 0.5 | 1.0 | 2.0 |
| Groundnut | 85 | 90 | 0.0 | 0.0 | | | | |
| Hemp | 60 | 85 | | | | | | |
| Jute | | | | | | | | |
| Leek | 60 | 90 | | | | | | |
| Lentil | 85 | 90 | 0.5 | 0.5 | | | | |
| Lettuce | 60 | 90 | | | | | | |
| Lupines | 85 | 90 | 0.5 | 0.5 | | | | |
| Maize | 85 | 95 | 0.0 | 0.0 | 0.1 | 0.5 | 3.0 | 5.0 |
| Mallow | 60 | 80 | | | | | | |
| Melon & cantaloupe | 60 | 92 | | | | | | |
| Melon, orange | 60 | 92 | | | | | | |
| Millet | 60 | 90 | 0.5 | 0.5 | | | | |
| Okra | 60 | 85 | | | | | | |
| Onion | 70 | 90 | 0.3 | 0.3 | | | | |
| Pea | 70 | 95 | | | 0.1 | 0.5 | 1.0 | 2.0 |
| Pepper | 40 | 95 | | | | | | |
| Pumpkin | 60 | 95 | | | | | | |
| Radish | 70 | 90 | 5.0 | | | | | |
| Rice | 85 | 95 | 0.0 | 0.3 | 0.1 | 0.3 | 1.0 | 2.0 |
| Rocket | 70 | 93 | | | | | | |
| Safflower | 80 | 95 | | 1.5 | | | | |
| Sesame | 85 | 90 | | | | | | |
| Sorghum, grain | 85 | 93 | 0.0 | 0.0 | 0.1 | 0.5 | 3.0 | 5.0 |

| CROP | GERM. (min. %) | PURITY (%) PS | OC | WS | OFFTYPES (max. %) FDTN | REG | CERT | COML |
|---|---|---|---|---|---|---|---|---|
| Sorghum, broom | 60 | 90 | | | | | | |
| Sorghum, sweet | 70 | 95 | 0.0 | 0.0 | | | | |
| Soybean | 75 | 90 | 0.5 | 0.5 | 0.1 | 0.5 | 1.0 | 2.0 |
| Spinach | 50 | 85 | | | | | | |
| Squash | 60 | 95 | | | | | | |
| Sudangrass | 60 | 90 | 0.5 | 0.5 | | | | |
| Sugarbeet | | | | | | | | |
| Sunflower | 80 | 95 | | | | | | |
| Tomato | 60 | 90 | | | | | | |
| Turnip | 70 | 93 | | | | | | |
| Watermelon | 60 | 95 | | | 0.1 | 0.5 | 1.0 | 2.0 |
| Wheat | 85 | 95 | 0.5 | 1.0 | 0.1 | 0.5 | 2.0 | 3.0 |

NOTE: GERM - germination; PC - pure crop seed (minimum %); OC - other crop seed (maximum %); WS - weed seed (maximum %); FDTN - Foundation seed; REG - Registered seed; CERT - Certified seed; COML - Commercial (non-certified) seed.

* Cottonseed PLS is established each year by Ministerial decree; for 1986-87, minimum PLS is 70% except for Giza 80.

CONSTRAINTS & NEEDS: Seed standards are apparently appropriate to current seed supply capabilities; greater effort should be applied to enforcing seed standards, especially at the level where farmers receive seed; and to providing facilities, supervision, training and support so both government and private-sector programs can achieve and improve standards, especially genetic purity. Standards should never be considered as inflexible and unchangeable; as facilities and technical training improve operations, standards should be adjusted accordingly, so that farmers receive seed of the maximum quality economically feasible for the seed production system. In some cases, requirements as to standards for other crop seed, weed seed, etc., could already be improved if adequate facilities and equipment were available.

## SEED CERTIFICATION

The Certification system or scheme set up under Law 53 of 1966 is similar to that in most developed countries in (1) providing the traditional 4 classes of seed multiplication--Breeder seed, Foundation seed, Registered seed, and Certified seed; (2) setting the usual regulations for land history, seed source, and varietal succession; and (3) providing for field, storehouse, and processing plant operations and supervision (Winrock/USAID).

At the primary agency responsible for implementing the government's seed supply policy, CAS arranges and supervises seed production, provides support services, and certifies the quality of the seed produced, through supervisory and Certification staff in different sections. Crops under the Certification program are shown in Table 14.

97

TABLE 14
CROPS WHOSE SEED ARE CERTIFIED
(Source: CAS, 1987)

| CROP | NO. OF VARIETIES CERTIFIED |
|---|---|
| Wheat | 9 |
| Barley | 8 |
| Bean, broad | 3 |
| Lentil | 2 |
| Onion | 1 |
| Rice | 5 |
| Cotton | 10 |
| Maize | 7 |
| Sweet sorghum | 3 |
| Grain sorghum3 | |
| Sesame | 2 |
| Groundnut | 2 |
| Soybean | 2 |
| Clover, berseem | |
| Flax | |

CONSTRAINTS & NEEDS: The established Certification system, and procedures specified for its implementation, are modern and satisfactory. Problems--and there are many--arise out of failure to implement the procedures, improper (inexpert) implementation primarily due to lack of staff training, shortcuts, inadequate facilities and transport, insufficient funds, and inadequate control of crucial operations such as processing, storage and distribution. A major deficiency/constraint is due to inadequate inspection of seed fields and facilities/procedures to control varietal purity and overall quality in the operations of drying, transport, processing, and storage.

## SEED TESTING

Seed testing procedures established under Law 53 of 1966 are, on paper, similar to those in most developed countries. Specified procedures for testing Certified seed for compliance with established seed quality standards, and tests for other purposes, conform to those in the Rules for Seed Testing of the International Seed Testing Association (ISTA).

Seed testing is, as it should be, a service/support function of government, through CAS and its laboratories at Giza, Tanta, and Menia. These labs are old (Giza was established in 1930, and has not had a major modernization since), poorly-equipped, inefficiently organized in work flow and personnel, and seriously lack up-to-date professional training for personnel. These labs annually handle more than 100,000 samples with less facilities and trained analysts than ISTA recommends for labs handling 20,000 samples.

CAS is urgently seeking support to modernize the existing 3 labs and to install 3 new labs at Assiut, Mansoura, and Zagazig; buildings have already been obtained. This upgrading would provide more accurate and uniform seed testing, reduce time and cost of testing, and provide better service to both private-sector and government seed supply efforts.

There is no program or system for training and/or registering/certifying seed analysts; after working in the laboratory for 2 years, a person is classified as an analyst.

Tests conducted include germination, purity, moisture, noxious weeds, presence of insects, and seed treatment. No vigor, tetrazolium, etc., tests are made. Seed testing operations are summarized by laboratory in Tables 15, 16, and 17; in these tables, the "other" column combines the total number of tests for insects and seed treatment.

TABLE 15
SEED TESTING BY THE GIZA LABORATORY
(Source: CAS records, 1987: 5/86 - 4/87)

Address: 8 Gamaa Street
Giza
tel. 724721
Total staff: 82 graduates & 50 technicians

| CROP | NUMBER OF TESTS CONDUCTED FOR: | | | | | | |
|---|---|---|---|---|---|---|---|
| | GERMINATION | | PURITY | | NOXIOUS WEED | | OTHER |
| | NO. OK | NO. RJCT | NO. OK | NO. RJCT | NO. OK | NO. RJCT | |
| Cotton | 39,800 | 200 | 7,000 | 3,000 | -- | -- | 10,000 |
| Wheat | 1,630 | 2 | 5,368 | 1,321 | -- | -- | 13,378 |
| Rice | 1,928 | 3 | 2,627 | 486 | -- | -- | 6,226 |
| Broad bean | 300 | -- | 997 | -- | -- | -- | 1,994 |
| Soybean | 385 | 10 | 395 | -- | -- | -- | 790 |
| Lentil | 327 | -- | 327 | -- | -- | -- | 654 |
| Groundnut | 150 | -- | 150 | -- | -- | -- | 300 |
| Maize | 240 | -- | 234 | 6 | -- | -- | 480 |
| Vegetables | 4,970 | 30 | 4,750 | 250 | -- | -- | 10,000 |
| Exported & imported seed | 1,591 | 9 | 1,575 | 25 | -- | -- | 3,200 |
| Grains for consumption | -- | -- | -- | -- | 495 | 5 | -- |
| TOTALS | 51,321 | 254 | 23,423 | 5,088 | 495 | 5 | 47,022 |
| % OF ALL TESTS | 42.0% | 0.2% | 19.2% | 4.2% | 0.4% | 0.004% | 38.5% |

TOTAL TESTS CONDUCTED: 122,261

Note: 232 moisture tests were conducted on maize seed; of these, 8 were rejected due to high moisture.

TABLE 16
SEED TESTING BY THE TANTA LABORATORY
(Source: CAS records, 1987: 5/86 - 4/87)

Address: Tanta, El Gharbia
tel. 040-345421

Total staff: 18 graduates & 60 technicians

| CROP | NUMBER OF TESTS CONDUCTED FOR: | | | | | | |
|---|---|---|---|---|---|---|---|
| | GERMINATION | | PURITY | | NOXIOUS WEED | | OTHER |
| | NO. OK | NO. RJCT | NO. OK | NO. RJCT | NO. OK | NO. RJCT | |
| Cotton | 29,016 | 160 | 5,106 | 2,188 | -- | -- | 7,294 |
| Wheat | 1,629 | 1 | 4,404 | 730 | 1,260 | 7 | 10,268 |
| Rice | 2,591 | 1 | 9,100 | 1,628 | -- | -- | 22,432 |
| Broad bean | 164 | -- | 726 | -- | -- | -- | 1,452 |
| Soybean | 607 | 13 | 618 | 2 | -- | -- | 1,240 |
| Lentil | 87 | -- | 194 | -- | -- | -- | 388 |
| Groundnut | 32 | -- | 32 | -- | -- | -- | 64 |
| Maize | 276 | 1 | 275 | 2 | -- | -- | 554 |
| Vegetables | 2,550 | 26 | 2,516 | 60 | -- | -- | 5,152 |
| Barley | 120 | -- | 152 | -- | -- | -- | 304 |
| TOTALS | 37,072 | 202 | 23,123 | 4,610 | 1,260 | 7 | 49,148 |
| % OF ALL TESTS | 33.5% | 0.2% | 20.9% | 4.2% | 11.4% | 0.006% | 44.4% |

TOTAL TESTS CONDUCTED: 110,603

Note: 272 moisture tests were conducted on maize seed; 5 were rejected.

TABLE 17
SEED TESTING BY THE MINIA LABORATORY
(Source: CAS records, 1987: 5/86 - 4/87)

Address:Minia
tel. 086-324411

Total staff:14 graduates & 32 technicians

| CROP | NUMBER OF TESTS CONDUCTED FOR: | | | | | | |
|---|---|---|---|---|---|---|---|
| | GERMINATION | | PURITY | | NOXIOUS WEED | | OTHER |
| | NO. OK | NO. RJCT | NO. OK | NO. RJCT | NO. OK | NO. RJCT | |
| Cotton | 17,700 | 76 | 2,667 | 1,777 | -- | -- | 4,444 |
| Wheat | 317 | 2 | 3,828 | 966 | -- | -- | 9,568 |
| Rice | -- | -- | 200 | 48 | -- | -- | 496 |
| Broad bean | 362 | -- | 2,445 | 3 | -- | -- | 4,896 |
| Soybean | 1,000 | 35 | 2,600 | 12 | -- | -- | 5,224 |
| Lentil | 197 | -- | 705 | -- | -- | -- | 1,410 |
| Groundnut | 4 | -- | 4 | -- | -- | -- | 8 |
| Maize | 481 | -- | 597 | 3 | -- | -- | 1,200 |
| Vegetables | 391 | 5 | 385 | 11 | -- | -- | 78 |
| Sorghum | 232 | -- | 232 | -- | -- | -- | 464 |
| Clover | 78 | 2 | 73 | 7 | -- | -- | 156 |
| TOTALS | 20,072 | 120 | 13,736 | 2,827 | -- | -- | 28,648 |
| % OF ALL TESTS | 32.9% | 0.2% | 21.8% | 4.5% | | | 45.4% |

TOTAL TESTS CONDUCTED: 63,146

Note: 119 moisture tests were conducted on maize; none were rejected.
(OK = quality acceptable; RJCT = below-standard quality, lot rejected).

102

From these Tables, it can be seen that a very large amount of seed, especially of crops such as clover, are planted without testing. It appears that farmers are not only unaware of seed quality and its importance, but are also unaware of the quality of the seed they plant.

Testing facilities are not only outdated, but are also inadequate for current needs. Only a part of the total seed planted is tested, due to lack of trained personnel/facilities/budgets to inspect all seed, but also due to the amount of seed supplied by organized seed programs whose seed is tested, and to limitations on the number of samples the labs can handle. The total germination tests conducted by the 3 labs operated by CAS (the only labs in the country) are compared with the quantities of seed planted by farmers in Tables 18 and 19, as an example of the urgent need for updated facilities and personnel training. These tables also indicate (by the amount of untested seed and the large amount of seed "represented" by each sample which is tested) the large quantities of seed which are farmer-saved--thus are not processed, treated, or tested--and do not enter the seed program channels. This is a direct indication of the lack of facilities for quality control, processing, and handling the required amount of seed.

TABLE 18
AMOUNTS & PERCENTAGES OF SEED WHICH ARE TESTED FOR GERMINATION
(Calculated from CAS & ARC records, 1987; based on 1985 crop data and 1987 number of samples tested)

| CROP | NO. SAMPLES TESTED | LOT SIZE TESTED (kg) | TOTAL SEED TESTED* (kg) | TOTAL SEED PLANTED (kg) | UNTESTED SEED AMOUNT (kg) | UNTESTED SEED % OF TOTAL |
|---|---|---|---|---|---|---|
| Cotton | 86,516 | | | 75,670,630 | | |
| Wheat | 3,576 | | | 88,944,225 | | |
| Rice | 4,519 | | | 55,538,260 | | |
| Bean, broad | 826 | | | 21,392,900 | | |
| Soybean | 1,992 | | | 4,761,920 | | |
| Lentil | 611 | | | 1,440,000 | | |
| Groundnut | 186 | | | 1,407,600 | | |
| Maize | 997 | | | 29,624,505 | | |
| Vegetables** | 7,911 | | | 7,595,355 | | |
| Sorghum | 232 | | | 4,125,000 | | |
| Clover | 78 | | | 70,174,175 | | |
| Barley | 120 | | | 7,475,900 | | |
| SEED NOT REPORTED AS BEING TESTED BY THE LABS: | | | | | | |
| Chickpea | | | | 1,133,400 | | |
| Cowpea, dried | | | | 302,400 | | |
| Flax | | | | 1,920,000 | | |

| CROP | NO. SAMPLES TESTED | LOT SIZE TESTED (kg) | TOTAL SEED TESTED (kg) | TOTAL SEED PLANTED (kg) | UNTESTED SEED AMOUNT (kg) | UNTESTED SEED % OF TOTAL |
|---|---|---|---|---|---|---|
| Lupines | | | | 750,000 | | |
| Melon & cantaloupe | | | | 35,394 | | |
| Pea, dried | | | | 300,560 | | |
| Sesame | | | | 104,240 | | |
| Sugarbeet | | | | 487,464 | | |
| Watermelon | | | | 183,248 | | |

* An unknown number of lots were tested more than 1 time. For this calculation, it was assumed that each test represented a distinct and different seed lot.

** Vegetables include: Green bean, cabbage, carrot, cauliflower, green cowpea cucumber, eggplant, fenugreek, lettuce, Egyptian mallow, Jews mallow, okra, green pea, pepper, radish, spinach, squash, tomato, and turnip.

TABLE 19
AMOUNT OF FARMER-PLANTED SEED REPRESENTED BY EACH SAMPLE TESTED FOR GERMINATION
(from CAS & ARC data, 1987; based on 1985 crop data and 1987 number of samples tested)

| CROP | TOTAL SAMPLES TESTED | TOTAL SEED PLANTED BY FARMERS (kg) | FARMER-PLANTED SEED REPRESENTED BY 1 TESTED SAMPLE (kg) |
|---|---|---|---|
| Cotton | 85,516 | 75,670,630 | 885 |
| Wheat | 3,576 | 88,944,225 | 24,873 |
| Rice | 4,519 | 55,438,260 | 12,268 |
| Bean, broad | 826 | 21,392,900 | 25,899 |
| Soybean | 1,992 | 4,761,920 | 2,391 |
| Lentil | 611 | 1,440,000 | 2,357 |
| Groundnut | 186 | 1,407,600 | 7,568 |
| Maize | 997 | 29,604,505 | 29,694 |
| Vegetables | 7,911 | 7,595,355 | 960 |
| Sorghum | 232 | 4,125,000 | 17,780 |
| Clover | 78 | 70,174,175 | 899,669 |
| Barley | 120 | 7,475,900 | 62,299 |

In Table 19, all seed is not actually represented by a tested sample; this only serves to illustrate the proportionate amount of seed as related to the number of samples tested. The actual sample represents only a specific, usually smaller quantity of seed; the remaining seed was not tested.

Both to speed up testing so seed can be delivered to farmers on time and to promote local private-sector seed development, all seed facilities should be dispersed in a network that provides efficient scale near the area where

seed is used and/or produced. This minimizes time and cost of transport, ensures more effective service, allows specialization in crops/areas, and speeds up reporting of test results.

In the same manner as processing facilities, seed testing labs should be dispersed on a Governorate basis to place the facilities closer to the areas they serve. To provide adequate industry-developing service and still operate efficiently and economically, the design of labs should be standardized. To provide presently-needed service without excessive cost while allowing flexibility for growth, testing needs can be provided by 3 standardized designs: a smaller lab for 5-10,000 (set up for 5,000 tests, but capable of peak periods at the rate of 10,000 tests annually) samples, a 25-30,000-test lab, and a 40-50,000-test lab. The number of labs needed, and the needed distribution according to Governorate, are shown in Table 20. This is the minimum required level of testing service required to permit the private sector to develop and the Seed Law to be implemented.

TABLE 20
TESTING LABS NEEDED
(based on ISTA, CAS & ARC data)

| GOVERNORATE | TOTAL SEED USED (mt) | TOTAL TESTS NEEDED 100% TESTED | TOTAL TESTS NEEDED 50% TESTED | TESTING LABS NEEDED NUMBER | TESTING LABS NEEDED VOLUME |
|---|---|---|---|---|---|
| LOWER EGYPT: | | | | | |
| Alexandria | 2,939 | 13,079 | 6,540 | 1 | 5-10,000 |
| Beheira | 38,299 | 170,431 | 85,216 | 2 | 40-50,000 |
| Gharbia | 28,652 | 127,501 | 63,751 | 2 | 25-30,000 |
| Kafr El Sheikh | 38,050 | 124,823 | 62,412 | 2 | 25-30,000 |
| Dakahlia | 53,362 | 237,461 | 118,731 | 2 | 40-50,000 |
| Damietta | 6,985 | 31,083 | 15,542 | 1 | 5-10,000 |
| Sharkhia | 44,956 | 200,054 | 100,027 | 2 | 40-50,000 |
| Ismailia | 3,942 | 17,542 | 8,771 | 1 | 5-10,000 |
| Suez | 257 | 1,144 | 572 | -- | |
| Menoufia | 17,394 | 77,403 | 38,723 | 1 | 25-30,000 |
| Kalubia | 7,291 | 32,445 | 16,225 | 1 | 5-10,000 |
| Cairo | 111 | 494 | 247 | -- | |
| MIDDLE EGYPT: | | | | | |
| Giza | 5,320 | 23,674 | 11,837 | 1 | 5-10,000 |
| Beni Suef | 17,055 | 75,985 | 37,993 | 1 | 25-30,000 |
| Fayoum | 16,059 | 71,463 | 35,732 | 1 | 25-30,000 |
| Minia | 27,839 | 123,884 | 61,942 | 2 | 25-30,000 |
| UPPER EGYPT: | | | | | |
| Assiut | 22,569 | 100,432 | 50,216 | 1 | 40-50,000 |
| Sohag | 20,723 | 96,828 | 48,414 | 1 | 40-50,000 |
| Qena | 10,331 | 48,274 | 24,137 | 2 | 5-10,000 |
| Aswan | 2,140 | 9,523 | 4,762 | 1 | 5-10,000 |
| NATIONAL TOTALS | 364,187 | | | 25 | |

108

These testing labs must be staffed by adequate numbers of highly-trained analysts, and an efficient operating system must be established. ISTA's recommendations are based on experience and time-and-motion studies; these are based on constant working for 8 hours per day, with 21 working days per month. A specific time span (varying with crop seed) is used to calculate the daily workload, which requires staff to prepare samples for testing. For example, the lab staffing pattern is based on usual seasonality of testing work, with 1,750 samples (35% of the total annual workload) received within a 3-month period. To provide the required promptness in service and reporting of test results (while conducting reliable and accurate tests) requires 4 purity analysts and 3 germination analysts. This level of staffing, according to ISTA, will sometimes create backlogs and delays in testing, b··· avoids seasonal over-employment.

Assuming a 5-hour effective workday instead of an 8-hour effective workday, the staffing pattern should include 6.4 purity analysts and 4.8 germination analysts to handle the same workload.

At the ISTA recommended staffing pattern, requirements for analysts in the laboratories needed to service the various Governorates (Table 20) is shown in Table 21. This is based on the same quantity of seed which was produced by organized programs in 1985, with improved number and quality of tests to emphasize quality rather than quantity, 35% of the tests received within a 3-month period of 63 work-days of 5 hours effective time per analyst. The average or mid-point of each lab's design/planned capacity is used as the base number of tests. The work must be organized so that the indicated number of analysts perform only moisture/purity tests or germination tests; there must be an adequate number of support personnel to divide/prepare samples, weigh purity tests, water and handle germination tests, and perform other routine but essential work.

By providing sampling equipment and transport, these trained analysts can als--during periods of lower workload--perform essential sampling services. This will provide highly-trained persons who can ensure that samples are properly taken and can give improved quality-control guidance to seed supply operations. The result is improved operations, better seed quality, and more efficient development of the private sector.

TABLE 21
NUMBER OF TRAINED PURITY AND GERMINATION ANALYSTS
NEEDED BY GOVERNORATE SEED LABS
(based on ISTA recommendations/data, & CAS & ARC data;
proper testing of the same quantity of seed which was
produced in 1985 by organized seed programs)

| GOVERNORATE | NO. OF LABS | NO. SAMPLES TESTED/LAB | NO. OF ANALYSTS REQUIRED PURITY | GERMINATION |
|---|---|---|---|---|
| LOWER EGYPT: | | | | |
| Alexandria | 1 | 5-10,000 | 10 | 7 |
| Beheira | 2 | 40-50,000 | 58 | 43 |
| Gharbia | 2 | 25-30,000 | 35 | 26 |
| Kafr El Sheikh | 2 | 25-30,000 | 35 | 26 |
| Dakahlia | 2 | 40-50,000 | 58 | 43 |
| Damietta | 1 | 5-10,000 | 10 | 7 |
| Sharkhia | 2 | 40-50,000 | 58 | 43 |
| Ismailia | 1 | 5-10,000 | 10 | 7 |
| Suez | -- | | | |
| Menoufia | 1 | 25-30,000 | 35 | 26 |
| Kalubia | 1 | 5-10,000 | 10 | 7 |
| Cairo | -- | | | |
| MIDDLE EGYPT: | | | | |
| Giza | 1 | 5-10,000 | 10 | 7 |
| Beni Suef | 1 | 25-30,000 | 35 | 26 |
| Fayoum | 1 | 25-30,000 | 35 | 26 |
| Minia | 2 | 25-30,000 | 35 | 26 |
| UPPER EGYPT: | | | | |
| Assiut | 1 | 40-50,000 | 58 | 43 |
| Sohag | 1 | 40-50,000 | 58 | 43 |
| Qena | 2 | 5-10,000 | 10 | 7 |
| Aswan | 1 | 5-10,000 | 10 | 7 |
| TOTAL | 25 | 385-500,000 | 570 | 420 |

CONSTRAINTS & NEEDS: Inaccurate and non-repeatable test results are directly due to lack of facilities, equipment, infrastructure and trained personnel. Improved facilities, more efficient equipment, better lab layouts, more effective work space, and more efficient operating procedures are urgently needed, as is adequate and intensive staff training in modern technology for uniform and repeatable testing procedures.

More of the seed planted by farmers needs to be sampled, and more use-oriented tests (i.e., germination, purity, and weed seed content) made on their seed.

**REFEREE TESTING**

Referee testing, which is a standard procedure internationally to promote more uniform test procedures and more repeatable and reliable test results, is not available. As a partial remedy for this and for the test reliability problem, CAS maintains a special Seed Testing Revision Section which receives complaints and retests disputed seed lots. A more costly effect--to agriculture--of this situation is the resultant loss of some good seed and lower quality in seed delivered to farmers. Operations of the Testing & Revision Section are shown in Table 22.

TABLE 22
SEED SAMPLE QUALITY & ACCEPTANCE
OPERATIONS OF CAS REVISION SECTION
(Source: CAS records, 1987: 10/86-9/887)

| CROP | NO. OF SAMPLES WHICH WERE: | | | |
|---|---|---|---|---|
| | REJECTED (BELOW STANDARD) | DISPUTED | RETESTED | ACCEPTED AFTER RETESTING |
| Wheat | 3,017 | 83 | 83 | 19 |
| Rice | 2,162 | 50 | 50 | 1 |
| Soybean | 14 | 5 | 5 | 3 |

CONSTRAINTS & NEEDS: A formal referee testing program to ensure standardized test procedures and repeatability of test results among labs does not exist, but is urgently needed. Equipment and facilities are inadequate and inaccurate; for example, in the germination room at the Tanta lab, temperature variation of 8 degr. C was measured. The CAS Testing Revision Section should be upgraded to include the National Seed Testing Referee, Standardization & Analyst Qualification Program.

## FOUNDATION SEED

Foundation seed production and supply is commonly a function of the central research agency, so as to use its expertise; however, a special unit/program in the research agency usually handles the operations of Foundation seed production/supply. Foundation seed production of all similar crops by a single specialized unit improves cost-efficiency, improves seed supply and quality, and saves the time of researchers/breeders.

ARC produces Foundation seed on State Farms under direct participation and supervision of research specialists from the Section responsible for the crop. Area to be planted for Foundation seed of each crop variety is established in conformity with State Farm rotation schemes, adaptability of the variety, seeding rate, multiplication ratio, etc., and is decided through discussion between CAS and ARC. Actual production is mostly left to the State Farms. The 18 State Farms which produce seed total some 30,000 feddans of crop land producing seed under contract for CAS. Crops in the seed production program include cotton, rice, wheat, barley, broad bean, lentil, maize, soybean, groundnut, berseem clover, flax, and onion.

Operations of State Farms involved in Foundation Seed production are shown in Table 23.

TABLE 23
STATE FARM PRODUCTION OF FOUNDATION SEED
(Source: ARC & CAS, 1987)

| GOVERNORATE & REGION | NO. OF FEDDANS IN SEED CROPS* | TONS SEED PRODUCED |
|---|---|---|
| LOWER EGYPT: | | |
| Alexandria | --- | --- |
| Beheira | 20 | 16.95 |
| Gharbia | 332 | 286.41 |
| Kafr El Sheikh | 662 | 905.41 |
| Dakahlia | --- | --- |
| Damietta | --- | --- |
| Sahrkhia | --- | --- |
| Ismailiia | --- | --- |
| Suez | --- | --- |
| Menoufia | --- | --- |
| Kalubia | --- | --- |
| Cairo | --- | --- |
| MIDDLE EGYPT: | | |
| Giza | --- | --- |
| Beni Suef | 183 | 233.73 |
| Fayoum | --- | --- |
| Minia | 26 | 18.15 |
| UPPER EGYPT: | | |
| Assiut | --- | --- |
| Sohag | 50 | 28.76 |
| Qena | 15 | 3.55 |
| Aswan | 24 | 2.33 |
| TOTALS | 1,312 | 1,495.29 |

* Crops include: cotton, wheat, rice, broad bean, lentil, groundnut, & soybean.

Foundation seed produced on State Farms are inspected and supervised by CAS. CAS also allocates distribution of Foundation seed; most are planted on State Farms to produce Registered seed. The remainder, as needed, are sent to District Bank storages for delivery to private farmers contracted by CAS to produce Registered seed needed above the amount which can be produced by State Farms.

CONSTRAINTS & NEEDS: ARC is responsible for managing State Farms, which produce Foundation seed. Responsibility and management of Foundation seed production, however, is widely dispersed. ARC has no special unit to handle Foundation seed, so crop research programs in the Research Institutes have the added responsibility of producing Foundation seed. Decentralized and fragmented Foundation seed production mitigates against quality improvement, wastes researcher time, and sometimes leads to production imbalances.

Equipment on State Farms is reported to be insufficient to produce the required Foundation seed efficiently.

Foundation seed processing and storage facilities on State Farms were poor to non-existent until 1985, when EMCIP established 4 facilities; the Rice project set up another plant. These now provide more capacity than required for Foundation and Registered seed produced on the State Farms. These plants provide adequate and technologically up-to-date facilities, but need some additional inputs such as internal quality-control systems, some more equipment and spare parts, and additional and improved storage.

Quantities of Foundation seed produced should be adequate to support the multiplication system with some reserves, but not in such large amounts that resources are wasted. Quantity of both Foundation and Registered seed has generally been adequate; however, private seed firms have complained about non-available or insufficient Foundation seed of maize, sorghum, berseem, and some vegetables. Foundation seed should be available to both private- and public-sector qualified seed operations.

There are also complaints about seed quality and timeliness of distribution of both Foundation and Registered seed.

Carnahan (Terminal Report, 1985) detailed problems besetting EMCIP efforts to organize production and improve quantity and quality of Foundation seed of wheat, maize, barley, sorgum and some grain and forage legumes. Problems included:

> Resistance from crop research leaders to give up their involvement in Foundation seed production so responsibility could be placed in a single new unit.

Lack of appreciation of the importance of Foundation seed production; i.e., the view that it does not merit status as a full-fledged program.

Insufficient funds for labor to rogue seed fields.

Lack of trained personnel.

The same constraints were encountered in the rice project; however, rice is the project's only crop and no attempt was made to merge Foundation rice seed with that of other crops, so more improvement in quality and quantity was possible; for example, incidence of red rice in commercial rice was substantially reduced after eliminating red rice contamination in Foundation and Registered seed.

Establishing a central specialized service unit to handle all Foundation seed would permit needed improvements in production efficiency, seed quality, and seed allocation; it would also be more responsive to seed production plans and market forces. With a special production unit, key researchers such as the originating breeders could still advise/oversee Foundation seed production without dissipating their time and energy in routine seed production operations.

## COTTON RESEARCH, BREEDER & FOUNDATION SEED

PRODUCTION & QUALITY: Cotton is a major cash crop and a major foreign exchange earner. The value of the high-quality long-staple Egyptian cotton (*Gossypium barbadense*) is affected by quality and uniformity of staple length. To achieve uniformity requires varietal purity, which requires 1-variety production areas and varietally-pure planting seed. In turn, genetically-pure cotton seed requires special Certified seed production systems including 1-variety gins and handling facilities.

Adequate farm income from cotton requires high yields and low input costs, as well as uniformly high-quality cotton. This requires that high-quality seed is available to farmers at a reasonable price, with minimum government subsidy.

Because of the necessity of controlling production to ensure quality and subsidizing operations, government operates cotton production as a monopoly. This includes producing and supplying seed.

SEED: ARC develops improved cotton varieties, and the Ministry of Agriculture establishes by Ministerial Decree the areas which produce each variety. Genetic characteristics of these improved varieties are delivered to farmers through quality seed. The seed supply system follows the

115

Certification scheme, and includes Breeder, Foundation, Registered and Certified seed. ARC is responsible for producing and supplying Breeder, Foundation and Registered seed classes.

The ARC cotton research and seed supply program includes 3 facilities:

1. The primary facility which supplies most seed, and on which the cotton seed supply system is absolutely dependent, is the Sakha (Kafr El Sheikh) seed gin facility. For Egyptian long-staple cotton, the roller gin (with reciprocating or rotary knife) is used, rather than the "saw type" gin used for American upland cotton. This facility was established in 1902, and has operated for 85 years without significant renewal or improvement. Equipment is badly worn, and operates inefficiently. The equipment is old and was not designed for seed and efficient "clean-out" when varieties are changed. The building itself is in poor condition.

2. One gin system is at Sids (Beni Suef) research station; however, this old facility is in bad condition, and is not regularly used or economically operable.

3. Bahteem (Gharbia) research station has a small gin with 6-8 stands.

SAKHA COTTON SEED OPERATIONS: Some 35,000 kintars of seed-cotton (1 kintar = 157.5 kg) are handled each year; there is now an urgent need to handle not less than 50,000 kintars annually, improve seed quality, and speed up delivery of seed. Of the weight of seed cotton (unginned) 65% is seed and 35% lint (fiber). Of the total seed ginned, 90% is used for planting. The remaining 10% is not used for planting, due to quality problems and the necessity of discarding the first seed passing through the equipment when varieties are changed.

12 storages are available; these are sheds with concrete floors but no walls. Seed cotton is received in bags; before ginning, bags are emptied into bulk piles in these sheds, according to variety. After ginning, seed is bagged and returned to the same storages. Storage is inadequate, but space is available to construct more storages. These operations are risky in terms of preventing varietal contamination; due to the lack of facilities, no other choice is available.

The gin presently operates 12 hours a day, from 0600 to 1800 hours, longer than desirable because of atmospheric moisture conditions in early morning and evening, as this gin has no drying system. The operating season covers some 100 days per year. Ideally, the gin should be operated not more than 10 hours per day, but operations must exceed this to complete the workload; due to deterioration in quality, the law does not permit cotton to be ginned after March 1.

Operating costs are covered by the regular budget of the ARC Cotton Research Institute. Several years ago, an effort was made to determine operating costs and quantify cost components, but inadequate data was available so the study was not satisfactorily completed. It is known, however, that operating costs are affected by condition of the equipment: old, inadequate in capacity, and high in labor requirements. The high labor requirements and low output indicate that operating costs are high, probably exceeding the LE 5/kintar commercial ginning fee charged by "commercial" gins which supply fiber for the market.

For quality control, CAS stations 1 agricultural engineer at each working gin during the operating season. This person samples seed for testing, and generally guides quality control to the extent possible in view of facility condition.

COMMERCIAL GIN FACILITIES: Commercial cotton for fiber is ginned by 5-6 government-enterprise companies under the Ministry of Economy. Currently, these companies operate 67 gins; until very recently, there were 102 gins, but these were consolidated into 67 because of old equipment, inefficient operation, and high labor costs. These gins handle some seed for planting purposes, but this is a secondary activity due to operating necessities, rather than specific design of facilities to handle seed.

These commercial ginning facilities are not suitable for pure seed, and cannot be used as substitute for improved ARC facilities.

SEED SITUATION: Cotton seed is primarily supplied by the Sakha ARC facility, which is old, worn out, costly to operate, and inefficient in time and cost. It also does not have the capacity to handle the desired increase in output, and does not have the complete "line" of equipment required to handle high-quality seed.

Presently, ARC does not have facilities for machine-delinting to reduce the amount of seed linters and improve seed condition and plant-ability, nor does it have acid-delinting equipment. The best modern simple and practical technique is acid-delinting, which permits good subsequent seed grading/processing to improve quality so farmers can plant to a stand. To save the linters and reduce acid consumption, seed are often machine-delinted before being acid-delinted.

CONSTRAINTS & NEEDS: Major quality problems include (1) the condition of equipment and facilities; (2) lack of adequate, complete facilities; (3) necessity of handling several varieties on the same facility; and (4) inability to clean-out the equipment adequately between varieties.

To minimize the risk of varietal contamination by other-variety seed remaining in the equipment, it is necessary to discard the first seed which passes through when a different variety is ginned.

Seed is presently supplied to farmers as "gin-run" or undelinted seed, due to the fact that delinting equipment is not available. In America where acid-delinted seed is popular, farmers plant 10 kg/acre or less; Egyptian farmers plant 70 kg/feddan, 7 times the American planting rate. This is because undelinted seed cannot be effectively cleaned to remove the immature low-germinating seed which are always present. By comparison, acid-delinted seed can be gravity-graded to remove immature seed and improve germination, so less seed can be used and the crop can be space-planted or "planted to a stand" to eliminate thinning and its associated labor requirements.

An upgraded facility is urgently needed to permit (1) adequate operating capacity; (2) cost-efficient operations; (3) improve seed preparation and plantability; (4) safeguard genetic purity of seed; (5) improve seed quality; (6) the required increase in capacity; and (7) supply seed in time for optimum planting, so as to provide better support to cotton farmers and carry research developments to farmers.

The needs would most efficiently by met by installing new equipment in the existing refurbished building, with the following 3 operations in sequence:

1. Ginning

   To remove fibers (lint) from the seed, and clean and bale it.

   This would require at least the following equipment: 10 rotary-knife gin stands, seed cotton cleaners, stick and green leaf machine, lint cleaner, condenser, lint slide, hydraulic press, cotton seed sterilizer (steam), power system, and conveying system. Seedcotton capacity should be not less than 10 tons/hour.

2. Machine delinting

   To remove a part of the linters from the ginned seed, before disposal as either planting seed or seed for oil purposes. This will produce a useful commodity (linters, or short fibers) which will help pay operating costs, and will also reduce the amount of acid required in the acid-delinting process.

   Required are machine-delinting stands, seed cleaner, conveying system, and power system. Input capacity should be not less than 7 tons/hour.

3. Acid delinting

To use sulfuric acid to remove remaining linters, so seed become free-flowing and can be graded/processed to high quality and farmers can plant to a stand.

This will require an acid delinter, washer-neutralizer, dryer, air-screen cleaner, gravity separator, treater, bagger/weigher/bag sewing machine, elevators and conveyors. Input capacity should be 6-7 tons/hour.

## REGISTERED SEED

CAS is responsible for producin ' seed beyond the Foundation stage. CAS arranges production of as much Registered seed as possible on State Farms (Table 24), and contracts with private farmers to produce the remainder required. CAS not only contracts for and supervises Registered seed, but also carries out Certification inspections and tests on Registered seed fields and seed lots.

ARC manages the State Farms, which contain the Research Stations, produce Foundation seed, and produce most Registered seed.

TABLE 24
STATE FARM PRODUCTION OF REGISTERED SEED
(Source: ARC & CAS, 1987)

| REGION & GOVERNORATE | FEDDANS IN REGISTERED SEED CROPS* | TONS SEED PRODUCED |
|---|---|---|
| LOWER EGYPT: | | |
| Alexandria | --- | --- |
| Beheira | 1,058.75 | 575.63 |
| Gharbia | 428.1 | 1,042.1 |
| Kafr El Sheikh | 6,222 | 6,825.46 |
| Dakahlia | --- | --- |
| Damietta | 107 | 60 |
| Sahrkhia | --- | --- |
| Ismailia | --- | --- |
| Suez | --- | --- |
| Menoufia | --- | --- |
| Kalubia | 130 | 74.1 |
| Cairo | --- | --- |
| MIDDLE EGYPT: | | |
| Giza | --- | --- |
| Beni Suef | 283 | 332.58 |
| Fayoum | 110 | 79.5 |
| Minia | 79 | 36.15 |
| UPPER EGYPT: | | |
| Assiut | --- | --- |
| Sohag | 210 | 125.68 |
| Qena | 92 | 37.87 |
| Aswan | 60 | 17.71 |
| TOTALS | 8,779.85 | 9,206.78 |

* Crops include: cotton, wheat, rice, broad bean, lentil, groundnut & soybean.

As is normal, standards for Registered seed set by Ministerial decree are lower than for Foundation seed.

Registered seed, produced by State Farms or by contracted farmers, are primarily processed in ARC or CAS plants, then transported to District Bank warehouses for distribution to Certified seed growers.

CONSTRAINTS & NEEDS: On State Farms, problems/deficiencies for Registered seed production are as for Foundation seed; for Registered seed produced by contract farmers, problems/deficiencies are as for Certified seed. Solutions to problems are the same as for Foundation or Certified seed, depending on where/how it is produced.

Considering land and processing/storage available on State Farms, as much Registered seed as possible should be produced on State Farms by the central Foundation seed unit which should be organized within ARC. State Farms should be able to produce all Registered seed needed, which would be desirable.

Amounts of Registered seed produced should be determined on the basis of amounts needed to produce the required Certified seed plus an adequate reserve, rather than on the basis of land available.

**CERTIFIED SEED**

Certified seed, the progeny of Registered or Foundation seed, are used by farmers to plant commercial crops. Certified seed are the end-product of the Certification component of the seed industry.

RESPONSIBILITY: CAS is responsible for Certified Seed production, through contracting with private farmers; however, maize seed is produced by the private sector. The government has encouraged formation of private companies to produce certified seed of both maize and vegetables, which--unlike most grain and field crops--are amenable to private-sector requirements.

PRODUCTION METHOD: Land available on State Farms is sufficient only to produce Foundation and most Registered seed. Certified seed production is contracted with private farmers, which is the most common arrangement used by public and private sectors throughout the world. CAS contract seed production arrangements, including selecting and "blocking" small growers to obtain larger more controllable production units, are similar "on paper" to those used in many other countries. The relatively small average farm size is sometimes cited as a major impediment to improving seed quality, but

successful seed programs operate in other countries which have comparable average farm size.

Contract farmer seed producers are selected according to usual criteria, but also require a minimum of 5 feddans field area. The farmer-seed grower receives credit to purchase Registered seed and other inputs at official (subsidized) prices. CAS staff try to supervise all operations from planting through harvest and threshing, and also certify the seed in terms of field standards. If fields pass the final inspection, the grower harvests, threshes and sun-dries the seed, and holds them until the CAS supervisor schedules delivery. Table 25 summarizes Certified seed production by Governorate.

TABLE 25
CAS CERTIFIED SEED PRODUCTION
(Source: CAS, 1987)

| GOVERNORATE | NO. OF CONTRACT FARMER/GROWERS | NO. OF FEDDANS IN SEED CROPS |
|---|---|---|
| LOWER EGYPT: | | |
| Alexandria | 44 | 8,591 |
| Behera | 880 | 74,965 |
| Gharbia | 1,069 | 63,394 |
| Kafr El Sheikh | 1,057 | 51,863 |
| Dakahlia | 1,715 | 73,243 |
| Damietta | 532 | 14,096 |
| Sahrkhia | 1,223 | 50,701 |
| Ismailia | 98 | 720 |
| Suez | -- | -- |
| Menoufia | 882 | 42,718 |
| Kalubia | 124 | 3,086 |
| Cairo | 1 | 5 |
| LOWER EGYPT TOTALS | 7,625 | 383,382 |
| MIDDLE EGYPT: | | |
| Giza | 143 | 885 |
| Beni Suef | 673 | 21,742 |
| Fayoum | 482 | 23,601 |
| Minia | 750 | 72,438 |
| MIDDLE EGYPT TOTALS | 2,048 | 118,666 |

122

| GOVERNORATE | NO. OF CONTRACT FARMER/GROWERS | NO. OF FEDDANS IN SEED CROPS |
|---|---|---|
| UPPER EGYPT: | | |
| Assiut | 323 | 46,672 |
| Sohag | 224 | 8,863 |
| Qena | 34 | 839 |
| Aswan | 4 | 231 |
| UPPER EGYPT TOTALS | 585 | 56,605 |
| NATIONAL TOTALS | 10,258 | 558,653 |

DELIVERY & PAYMENT: The CAS supervisor/inspector arranges with the local branch of PBDAC for new jute bags, so the seed grower can avoid varietal contamination from used bags. The grower is required to deliver seed to the designated BDAC branch store, where they are received by CAS and BDAC staff. Upon delivery, a base payment of the grain procurement price of the quantity/crop delivered is made to the grower by BDAC.

QUALITY TESTING: Upon delivery, seed are sampled by a CAS inspector and the sample is sent to a seed lab for testing. If the seed meet established quality standards, BDAC pays the grower the established premium, in addition to the grain procurement price already paid. Seed lots that fail to meet standards by only a small margin are held for up to 60 days in case the seed supply is short and standards must be lowered. If seed shortage occurs, the lot is accepted and the premium is paid to the grower. When lots are rejected at the first test or after it becomes clear that substandard seed will not be needed, they are disposed of in the normal MOS procurement system and no premium is paid. Table 26 shows the seed premiums paid to contract growers for accepted seed.

TABLE 26
PREMIUMS PAID BY CAS TO FARMER CONTRACT SEED GROWERS
(Source: CAS, 1987)

| CROP | PREMIUM PAID PER ARDEB OF SEED | |
|---|---|---|
| | LE | % OF GRAIN PRICE |
| Wheat | 10.00 | 40 |
| Broad bean | 10.00 | 15.4 |
| Onion | 15.00 | 13 |
| Rice | 4.80 | 32 |
| Cotton | 0.403 | 6 |
| Sweet sorghum | 15.00 | 17.6 |
| Grain sorghum | 1.00 | 3.2 |
| Sesame | 3.00 | 2.5 |
| Groundnut | 8.00 | 20 |
| Soybean (NOTE: Premium/ton) | 15.00 | 5 |

FINANCING: PBDAC is the financing agent in contract production, paying for new bags, base procurement price and premiums.

PROCESSING & HANDLING: Accepted raw seed are held at the BDAC store until CAS orders delivery to the appropriate EAA or CAS processing plant. Transport to the processing station is arranged and financed by BDAC. Raw seed received at the processing plant are held in open or shed storage until processed.

Processing efficiency and effectiveness are highly variable. Many of the plants are old--especially those owned by CAS--and equipment is so badly worn that processing is not effective or efficient. Some of the newer plants are modern and efficient.

Percentage of processed seed obtained from raw seed ranges from 95% to 65%, depending on crop, initial quality, and condition and management of the processing plant (see Table 27). PBDAC pays the processor--EAA or CAS--an established fee per unit of processed seed. NOTE however, that seed of faba bean, lentil, and groundnut are not usually processed before distribution, according to CAS.

Table 27 shows high percentages of seed lost in processing, relative to other countries with similar agricultures and seed programs. For example, average processing loss in wheat and rice seed should be around 5%, instead

of the 14-22% losses here; the other crops should vary between 5% to 10% cleaning loss.

These excessive cleaning losses are largely due to the poor condition of the processing equipment, and to lack of proper equipment to make the required separations at minimum losses.

These excessive processing losses are expensive to the program. For example, if the 22.2% loss in wheat were reduced to the more common figure of 5% cleaning loss, 17.2% more seed could be obtained without increasing the production area or costs; this would be 17,200 tons of "free seed" at no extra cost to the program.

TABLE 27
AVERAGE % LOSS DURING SEED PROCESSING
(Source: CAS, 1987)

| CROP | AVE. % WEIGHT LOST IN PROCESSING |
|---|---|
| Wheat | 22.2 |
| Rice | 14.7 |
| Soybean | 15.5 |
| Lentil | 11.2 |
| Broad bean | 10.0 |

Processed seed are held in storage at the processing station for sampling and final testing by CAS. If the seed pass final tests, they are held in storage until CAS orders distribution. Rejected seed are delivered into the MOS procurement system.

CONSTRAINTS & NEEDS: Several problems of contract production are due to lack of adequate incentives to farmers, and distortions in commodity values resulting from controlled prices. Although contract seed growers are paid a premium over the official (controlled) price for grain, this is often substantially less than the free-market grain price. Seed producers, therefore, seldom deliver to CAS more than the established quota of seed, and often deliver to CAS only the poorest-quality seed because the free market pays a better premium for better quality.

The quota often represents only about half the seed produced by the contract farmer, so there are large "leakages". Adequate grower incentives--premiums--would improve both seed quality and overall production efficiency; for example, if contracted farmers deliver all their seed production to CAS, the number of growers could be reduced 25-40%, which would facilitate inspection and supervision by CAS, reduce requirements for Foundation and Registered seed, reduce land required to produce Foundation and Registered seed, and lower overall seed production costs.

Problems other than poor quality and low delivery rate occur. Seed producers, who should be selected from among the most progressive farmers, receive specific amounts of seed and fertilizer. If the amount of Registered seed allotted is not sufficient--in the farmer's judgment; planting rates are high--for the best crop yield, he may supplement it with his own saved seed. This nullifies all efforts of the Certification process to maintain varietal purity. Control of seed source, the first of 2 critical controls in seed Certification, is thus not as effective as it should be.

A serious problem has been inadequate field inspections, which constitute the second of the 2 crucial controls in seed Certification. There was essentially no field inspection until the last several years. Currently, a serious effort is underway to field-inspect as many contracted seed fields as possible. ARC staff assist CAS staff in field inspection, but all fields are still not inspected and inspection is sometimes inadequate (Winrock/USAID).

Serious constraints/deficiencies are also due to seed processing facilities being dispersed among several agencies without clear lines of responsibility or authority, and continued use of some older plants which are poorly designed, worn out and in an advanced state of disrepair.

Seed storage provisions including sanitary measures are also inadequate to prevent losses and damage by pests.

## FIELD PRODUCTION SUPERVISION & INSPECTION

CAS is responsible for seed production, and supervises contract farmer seed growers and inspects their fields for quality control. Recent efforts by the CAS Director to establish a thorough field inspection program and adhere to testing standards are commendable and should be supported, continued, improved and extended.

<u>CONSTRAINTS & NEEDS</u>: CAS has inadequate personnel, transport and operating funds to inspect seed fields as required to maintain seed purity and quality. Also, personnel do not have the necessary in-depth training in seed technology and crop/seed production.

Worldwide, seed programs generally visit each contract farmer and inspect his field every 2 weeks; this requires adequate operating funds, transport for inspectors, and trained inspectors. CAS does not have these.

The seed handled by CAS alone is produced on some 550,000 feddans distributed throughout 15 Governorates. This large number of farmers, large area, dispersed production, and distance to seed farms/fields creates major logistical problems in supervising and inspecting seed fields and crops.

In addition, seed inspectors in general have inadequate training in seed technology, which constrains their ability to handle the program, guide seed-growing farmers, and ensure seed quality effectively. They also do not have adequate transport and operating funds to inspect seed fields as required technically to maintain quality and assist farmer-growers. Specialists of the ARC often assist inspectors to guide them in crop characteristics, seed crop requirements, etc. However, this is not only a waste of the time of research specialists, but also reflects the poor quality of training and technical abilities of the assigned inspectors.

A related problem affecting seed quality is that no seed operation--government or private sector--has the internal quality control system normally considered essential. The CAS, the primary agency responsible for field inspection and grower supervision, provides this service for private-sector and government seed programs. However, its staff face constraints in training, transport, and funding; the CAS cannot provide--under present operating limitations--the required services nor the required frequency of services (each seed field and contract seed grower is normally visited, guided and advised every 2 weeks in a quality seed program).

Data on CAS field inspection/supervision activities are shown in Table 28.

TABLE 28
CAS SEED PRODUCTION SUPERVISION
(Source: CAS, 1987)

| CITY | GOVERNORATE | NO. OF INSPECTORS | NO. OF SUPERVISORS | NO. OF GROWERS | FEDDANS |
|---|---|---|---|---|---|
| LOWER EGYPT: | | | | | |
| Alexandria | Alexandria | 24 | | 44 | 8,591 |
| Damanhour | Gharbia | 126 | | 880 | 74,965 |
| Tanta | Gharbia | 147 | | 1,069 | 63,394 |
| Kafr El Sheikh | Kafr El Sheikh | 113 | | 1,057 | 51,863 |
| Mansoura | Dakahlia | 264 | | 1,715 | 73,243 |
| Damietta | Damietta | 79 | | 532 | 14,096 |
| Zagazig | Sharkia | 116 | | 1,223 | 50,701 |
| Ismailia | Ismailia & Suez | 3 | | 98 | 720 |
| Shepin El Khoum | Menoufia | 82 | | 882 | 42,718 |
| Banha | Kalubia | 52 | | 124 | 3,086 |
| Cairo | Cairo | -- | -- | 1 | 5 |
| LOWER EGYPT TOTALS | | 1,006 | | 7,625 | 383,382 |
| MIDDLE EGYPT: | | | | | |
| Giza | Giza | 7 | | 143 | 885 |
| Beni Suef | Beni Suef | 57 | | 673 | 21,742 |
| Fayoum | Fayoum | 52 | | 482 | 23,601 |
| Minia | Minia | 94 | | 750 | 72,438 |
| MIDDLE EGYPT TOTALS | | 210 | | 2,048 | 118,666 |

128

| CITY | GOVERNORATE | NO. OF INSPECTORS | NO. OF SUPERVISORS | NO. OF GROWERS | FEDDANS |
|---|---|---|---|---|---|
| UPPER EGYPT: | | | | | |
| Assiut | Assiut & El Wadi | 103 | | 323 | 46,672 |
| Sohag | Sohag | 59 | | 224 | 8,863 |
| Qena | Qena | 24 | | 34 | 839 |
| Aswan | Aswan | 10 | | 4 | 231 |
| UPPER EGYPT TOTAL: | | 196 | | 585 | 56,605 |
| NATIONAL TOTALS | | 1,412 | | 10,258 | 558,653 |

## TRANSPORT FOR "OVERSEEING/INSPECTING" PERSONNEL

The seed handled by CAS is produced on over 550,000 feddans distributed throughout 15 Governorates. This large number of farmers, large area, dispersed production, and distance to seed farms/fields requires a great deal of travel, even locally, by inspectors, samplers, and production supervisors to perform the work essential to maintain seed quality.

CONSTRAINTS & NEEDS: Available transport is inadequate to mobilize field inspectors and supervisors responsible for supervising/inspecting/guiding/leading/sampling/etc., to promote effective seed operations and maintain seed quality. This includes quality-control operations of CAS in supervising Certified seed growers, sampling seed to implement the Seed Law, inspecting seed fields under Certification, etc.

## NON-CERTIFIED SEED

Significant amounts of non-certified seed are still grown and saved by farmers for their own use and for sale to neighbors. This is more common in some crops (such as berseem clover) than in others.

CONSTRAINTS & NEEDS: There is no extension/educational "seed awareness" training for farmers, so farmers do not realize the value of seed quality and do not understand the components of seed quality. Inadequacies in seed supply and timeliness of supply further complicate seed usage and quality problems.

## PROCESSING

PRESENT FACILITIES: The majority of the existing processing plants are old, badly worn, inadequate, and require replacement. CAS operates 2 seed plants (established 1953-76) and has another now-outmoded plant which was only recently brought into operation. EAA has 8 plants (erected 1955-85), and has been processing most of the Certified seed. Most plants are in poor condition, with inadequate equipment which interferes with efficient processing and creates dust, health and machinery hazards for personnel. EAA recently completed a new plant at Bahtim, and plans new plants at Minia, Tanta, and Mansoura when project support becomes available.

ARC operates 4 (1--Sakha--' as 2 processing "lines") modern processing plants for Foundation seed, established under EMCIP. These plants have recently gone into operation, and have--as do most new plants--already shown needs for additional equipment and spare parts to operate effectively. A new Foundation seed plant is now in operation at the ARC Rice Research Center at Sakha. To obtain maximum use of the investment in facilities and to conserve national resources, the ARC EMCIP and RRC plants also process Registered and Certified seed, and the EMCIP plants process seed for private firms, as support to development of the private sector.

The number of plants is quite misleading, in terms of processing capability. CAS reports that all seed are not processed; relatively clean farmer-run lots of some crop seed are sometimes sent out without processing; seed of much cotton and groundnut are not mechanically processed due to lack of the appropriate special equipment. While 16 plants are listed under the government seed program, 9 of the 16 plants are outmoded, worn, inefficiently operating and in need of immediate replacement. The Winrock/USAID report identifies these 9 existing plants as in "immediate need of replacement".

PROCESSING & SEED QUALITY: Seed physical purity standards (see Table 13) are somewhat low, as compared with many other countries. This is a direct reflection of the lack of processing capability; with adequate processing facilities, seed mechanical purity could be improved, while at the same time reducing cleaning losses. For example, minimum wheat purity is 95%, and 1.0% weed seed are allowed; with adequate processing facilities, the purity standards could be raised to the more common 98% for Certified seed, and weed seed content could be reduced to 0.25% or other appropriate level.

Adequate processing facilities could improve seed quality and help farmers get better stands with less seed, while reducing weed problems by removing more weed seed from the crop seed.

-120

LOSS OF SEED DUE TO POOR PROCESSING FACILITIES: High percentages of seed are lost in processing, relative to other, similar seed programs. Processing loss in wheat and rice seed should be around 5%, instead of the 14-22% losses experienced here; the other crops processed by the program should show cleaning losses between 5% and 10%. These excessive cleaning losses are largely due to the poor condition of processing equipment, and to lack of proper machines to make the required separations at minimum losses. Processing machines are designed to separate specific undesirable particles according to specific dry-solid-particulate physical differences; when normally-used separating machines are not available and incorrect machines must be used, loss of good seed is higher.

Excessive processing losses are expensive to the seed program and to the government; if the 22.2% loss in wheat were reduced to the expected 5%, 17.2% more seed--17,200 tons--could be obtained "free", without increasing production area or total seed costs.

AMOUNT PROCESSED: Contrary to some reports, only a small part of the seed of some crops planted by farmers has undergone processing to give farmers the benefits of removing foreign material, dead and/or broken crop seed, weed seed, and other crop seed. Table 29 shows the amounts of seed planted and the amounts of seed processed.

TABLE 29
SEED PROCESSED AND SEED PLANTED BY FARMERS
(From CAS & ARC data, 1987; based on 1985 crop data)

| CROP | TOTAL SEED PLANTED BY FARMERS (mt) | TOTAL SEED PROCESSED BY GOVT. & PRIVATE AGENCIES (mt) |
|---|---|---|
| Barley | 7,476 | 7,000 |
| Bean, broad | 14,275 | 20,000 |
| Bean, green | 4,437 | 1,500 |
| Bean, dried | 449 | 500 |
| Cabbage | 5 | |
| Carrot | 62 | 36 |
| Cauliflower | 4 | |
| Chickpea | 1,133 | |
| Clover, berseem | 70,174 | |
| Cotton* | 75,671 | 100,000 |
| Cowpea | 467 | |
| Cucumber | 64 | 70 |
| Eggplant | 11 | 10 |
| Fenugreek | 792 | |
| Flaxseed | 1,920 | |
| Jute, Malta | 68 | |
| Lentil | 1,440 | 1,100 |
| Lettuce | 7 | |
| Lupines | 750 | |
| Maize | 29,625 | 8,000 |
| Mallow, Egyptian | 14 | |
| Mallow, Jews | 150 | |
| Melon & cantaloupe | 35 | 50 |
| Okra | 196 | |
| Onion | 1,002 100 | |

| CROP | TOTAL SEED PLANTED BY FARMERS (mt) | TOTAL SEED PROCESSED BY GOVT. & PRIVATE AGENCIES (mt) |
|---|---|---|
| Pea | 1,000 | 850 |
| Groundnut* | 1,408 | |
| Pepper | 7 | 9 |
| Radish | 31 | |
| Rice | 55,438 | 80,000 |
| Sesame | 104 | 30 |
| Sorghum | 4,125 | |
| Soybean | 4,762 | 6,000 |
| Spinach | 78 | |
| Squash | 120 | 85 |
| Sugarbeet | 487 | |
| Tomato | 122 | |
| Turnip | 27 | |
| Watermelon | 183 | 220 |
| Wheat | 88,944 | 100,000 |

* Special equipment is required to process seed of cotton and groundnut. CAS reports that the equipment is not available in Egypt, so seed is released to farmers without processing (except basic cleaning done without machinery, and cottonseed processed by the cottonseed cleaning equipment at Sakha). Also, seed of broad bean is sometimes sold without mechanical cleaning; broad bean is susceptible to mechanical damage, and should have special processing facilities to maintain high viability.

ABILITY TO MAKE REQUIRED SEPARATIONS: Most processing plants have the basic cleaner--various models of air-screen cleaner. Only the EMCIP and rice plants are complete processing plants; and, the complete "line" of separators in the EMCIP plants is generally not used; only the scalper and basic air-screen cleaner are used, in order to get higher processing capacity to meet the processing needs in spite of the lack of adequate processing plants/ equipment.

There are shortages of equipment and components (such as correct screen sizes in good condition) which can make separations required for the crop seed being handled. Examples:

1. Only two plants (Sids EMCIP and the Nubaria Seed Co.'s vegetable seed plant) have a roll mill to remove dodder seed from clover, even though dodder is a common weed in clover fields and a common clover seed contaminant. Further, the roll mill at the Sids plant is a small model put in more-or-less as a "pilot" (thus fulfilling government's role to provide pilot facilities to guide the private sector, although it does not provide adequate processing capacity), not matching the capacity of the rest of the plant. While the "design capacity" of the plant is 6 tons/hour, the existing roll mill can process clover seed accurately at only about 0.75 ton/hour. The Nuba Seed Co. reports that it can clean about 1 ton per hour using the roll mill.

2. Only the new plants have gravity separators, required to remove light foreign material and dead s d from many crop seed.

3. Few plants have machines to effectively make the required length separations of small grain (wheat, rice, barley) seed, which are major crops. Several plants have cylinder separators, but these do not make a complete (i.e., remove both long and short undesirable particles) length separation, are difficult to adjust, or have too low capacity, so they are not normally or effectively used.

PROCESSING CAPACITY: Plants are reported to have the design capacities listed in Table 30. Design capacity, however, has little relationship to capacity obtained in actual operation. Machines are rated at a "capacity" often based on grain cleaning; grain cleaning can be "rough" and less precise, as contrasted to the closer precise separation required for seed. In general, "seed cleaning" capacity is approximately half the "grain cleaning" capacity of a machine. Effective capacity is further reduced when raw unprocessed seed has much undesirable material, as is common in seed programs with small-farmer contract growers who have no mechanical thresher-cleaner equipment. Table 30 also shows maximum capacities reportedly obtained in actual operations by some of the existing processing plants.

TABLE 30
"DESIGN" AND ACTUAL PROCESSING CAPACITIES
(From Winrock/USAID, ARC and CAS; 1987)

| PLANT | "DESIGN CAPACITY" (tons/hour) | ACTUAL SEED CAPACITY (tons/hour) | CONDITION (from Winrock/ USAID) |
|---|---|---|---|
| Sakha CAS | 13-15 | 4-5 | POOR (replacement recommended) |
| Gemmeza CAS | 2-3 | | INOPERABLE* (replacement recommended) |
| Sids CAS | 4-6 | | FAIR-POOR (replacement recommended) |
| Tanta EAA | 9-12 | 4-5 | POOR (replacement recommended) |
| Damanhour EAA | 12-15 | 8-10 | Good |
| Shoubra El Khema EAA | 3-7 | 2-3 | POOR (replacement recommended) |
| Mansoura EAA | 3-7 | 2-3 | POOR (replacement recommended) |
| Wadi El Nil EAA | 3-5 | | VERY POOR (replacement recommended) |

135

| PLANT | "DESIGN CAPACITY" (tons/hour) | ACTUAL SEED CAPACITY (tons/hour) | CONDITION (from Winrock/ USAID) |
|---|---|---|---|
| El Minia EAA | 7-9 | | VERY POOR (replacement recommended) |
| Deirout EAA | 3-7 | | POOR (replacement recommended) |
| Bahtim EAA | 30 | | Excellent |
| Sakha ARC Rice | 9 | | New |
| Sakha ARC EMCIP | 12 | Wheat/maize 6** | New |
| Gemmeza ARC EMCIP | 6 | Wheat/maize 3** | New |
| Sids ARC EMCIP | 6 | Clover 0.75-1.0<br>Wheat 3** | New |
| Shandaweel ARC EMCIP | 6 | Wheat/maize 3** | New |

* Gemmeza CAS plant has recently been brought into operation, using the old equipment.

** The EMCIP plants should give the above-listed maximum capacities when properly-operated to give the design separations. However, because of the lack of processing plants, ARC staff do not make complete separations; they bypass the lower-capacity--but essential to make the required separations and clean seed completely--separators, and use only the scalper and air-screen cleaner to make a basic cleaning operation without bringing the seed up to the quality possible if there were adequate processing facilities so these plants could operate properly on a reasonable amount of seed.

PLANT LOCATION: Locations of processing plants are shown in Table 31. Locations of some plants do not match the production or use pattern, and some areas that could produce seed do not have plants. For example, although one of the modern EMCIP plants is located in Sakha, it cannot process clover seed. Clover seed produced in this area is transported to Sids for processing, and then transported back to Sakha for use.

Several Governorates have no processing facilities, even though they use large amounts of seed. This lack of processing plants effectively prevents the development of seed production in these Governorates. Also, lack of processing support prevents development of private-sector seed operations, especially the most desirable kind--small to medium operations established by Egyptians to serve local needs for a broad range of crop se , including the low-profit/high-volume crops which are not attractive to the larger multi-national seed firms.

TABLE 31
LOCATIONS OF EXISTING PROCESSING PLANTS BY GOVERNORATE
(Source: CAS, 1987)

| GOVERNORATE | FEDDANS CULTIVATED | NO. OF PLANTS | LOCATION | OPERATED BY |
|---|---|---|---|---|
| LOWER EGYPT: | | | | |
| Alexandria | 90,057 | 0 | | |
| Beheira | 705,092 | 1 | Damanhour | EAA |
| Gharbia | 409,342 | 3 | Tanta | EAA |
| | | | Gemmeiza | ARC |
| | | | Gemmeiza | CAS |
| Kafr El Sheikh | 462,139 | 2 | Sakha | CAS |
| | | | Sakha (2 lines) | ARC |
| Dakahlia | 574,873 | 1 | El Mansoura | EAA |
| Damietta | 96,493 | 0 | | |
| Sharkhia | 654,320 | 0 | | |
| Ismailia | 94,326 | 0 | | |
| Suez | 7,879 | 0 | | |
| Menoufia | 330,150 | 0 | | |
| Kalubia | 186,562 | 3 | Wadi El Nil | EAA |
| | | | Bahteem | EAA |
| | | | Shobra El Khema | EAA |
| Cairo | 4,591 | 0 | | |

| GOVERNORATE | FEDDANS CULTIVATED | NO. OF PLANTS | LOCATION | OPERATED BY |
|---|---|---|---|---|
| MIDDLE EGYPT: | | | | |
| Giza | 166,461 | 0 | | |
| Beni Suef | 241,876 | 2 | Sids<br>Sids | CAS<br>ARC |
| Fayoum | 316,315 | 0 | | |
| Minia | 439,343 | 0 | | |
| UPPER EGYPT: | | | | |
| Assiut | 354,916 | 1 | Deirout | EAA |
| Sohag | 287,434 | 1 | Shandaweel | ARC |
| Qena | 307,958 | 0 | | |
| Aswan | 100,116 | 0 | | |
| National totals: | 5,906,856 | 16 | | |

National average cultivated feddans per processing plant: 393,790

PROCESSING PLANTS NEEDED: In an agro-economy and climate such as Egypt's where seed can be grown in any location if trained persons and facilities are available, processing plants should be located where they will reduce seed transport costs, ensure seed supply to farmers, and help develop local seed production.

Most economic--in terms of government expenditure, efficient supply of seed to farmers, and support to development of the private sector--is a national network of processing plants which serve specific areas and help develop local seed production. This, for example, is the system established in Thailand, India and Brazil, which are credited with good seed industries.

Table 32 shows present and needed processing plants in each Governorate, in order to handle only the Field Crop seed required in the respective

Governorate. Because of the special technology required for vegetable seed, its production and processing should be handled separately, in concentrated points where possible.

The number of plants needed, as shown in Table 32, is based on 5,000 tons annual output of cleaned seed per plant, based on 2 cleaning seasons (multiple cropping) in the organized (i.e., at this stage, government) seed program. Each plant should have the normal margin of 50-100% extra capacity (which costs relatively little more to install and operate) to permit providing "custom" processing services (charged on a per-kg basis) in the early operating years of farmers, firms, and local cooperatives who develop seed production programs. This service should also be offered to larger, international private seed firms who normally prefer to begin operations without the large investment in a seed plant; this enables them to determine potential market growth more effectively, so the plants/facilities they construct later are better-suited to actual local conditions. This form of private-sector support has been practiced in many countries (e.g., Thailand) in developing private-sector seed supply; in Egypt, this was done to help establish Misr Pioneer and is still done to support private seed firms such as those supplying clover seed.

TABLE 32
SEED PROCESSING RESOURCES AND NEEDS
OF GOVERNORATES FOR ONLY FIELD CROP SEED
(From ARC & CAS data, 1987)

| GOVERNORATE | TOTAL FIELD CROP SEED USED (MT) | NO. OF EXISTING PLANTS | NO. PLANTS NEEDED |
|---|---|---|---|
| LOWER EGYPT: | | | |
| Alexandria | 2,117 | 0 | 1 |
| Beheira | 39,022 | 1 | 8 |
| Gharbia | 28,193 | 3 | 6 |
| Kafr El Sheikh | 37,970 | 2 | 8 |
| Dakahlia | 52,648 | 1 | 10 |
| Damietta | 6,901 | 0 | 1 |
| Sharkhia | 44,502 | 0 | 9 |
| Ismailia | 3,727 | 0 | 1 |
| Suez | 228 | 0 | 0 |
| Menoufia | 16,970 | 0 | 3 |
| Kalubia | 5,578 | 3 | 1 |
| Cairo | 94 | 0 | 0 |
| MIDDLE EGYPT: | | | |
| Giza | 4,472 | 0 | 1 |
| Beni Suef | 16,497 | 2 | 3 |
| Fayoum | 14,054 | 0 | 3 |
| Minia | 22,422 | 0 | 4 |
| UPPER EGYPT: | | | |
| Assiut | 19,763 | 1 | 4 |
| Sohag | 17,185 | 1 | 3 |
| Qena | 10,182 | 0 | 2 |
| Aswan | 2,049 | 0 | 1 |
| TOTAL | 344,564 | 16 | 69 |

PLANT OPERATIONS: Processing plant operating details and procedures, and the latest available data on amounts of clean seed processed, are shown in Table 33.

TABLE 33
PROCESSING PLANT OPERATIONS
(Source: CAS records, 1987)

| CROP | PROCESSING SEASON FROM | PROCESSING SEASON TO | DAYS/WEEK WORKED IN SEASON | HOURS/DAY WORKED IN SEASON | TOTAL TONS CLEAN SEED OUTPUT |
|---|---|---|---|---|---|
| CAS SAKHA PLANT (KAFR EL SHEIKH GOVERNORATE): | | | | | |
| Wheat | Aug | Oct | 6-7 | 16 | 2,833 |
| Rice | Dec | Apr | 6-7 | 16 | 5,628 |
| Soybean | Dec | --- | 6-7 | 16 | 167 |
| Maize | Nov | Jan | 6-7 | 16 | 119.5 |
| | | | | TOTAL | 8,747.5 |
| CAS SIDS PLANT (BENI SUEF GOVERNORATE): | | | | | |
| Wheat | Jul | Oct | 6-7 | 16 | 1,879 |
| Maize | Jan | Feb | 6-7 | 16 | 1,833 |
| | | | | TOTAL | 3,712 |
| CAS GEMMEIZA PLANT (GHARBIA GOVERNORATE): | | | | | |
| Wheat | Aug | Oct | 6-7 | 16 | 161.5 |
| Rice | Jan | Feb | 6-7 | 16 | 609 |
| Maize | Dec | Jan | 6-7 | 16 | 77 |
| | | | | TOTAL | 847.5 |
| EAA EL MANSOURA PLANT (DAKAHLIA GOVERNORATE): | | | | | |
| Wheat | Jul | Oct | 6-7 | 16 | 4,453.5 |
| Rice | Dec | May | 6-7 | 16 | 5,706.5 |
| Soybean | Nov | Dec | 6-7 | 16 | 238.5 |
| | | | | TOTAL | 10,398.5 |

| CROP | PROCESSING SEASON FROM | TO | DAYS/WEEK WORKED IN SEASON | HOURS/DAY WORKED IN SEASON | TOTAL TONS CLEAN SEED OUTPUT |
|---|---|---|---|---|---|
| EAA TANTA PLANT (GHARBIA GOVERNORATE): | | | | | |
| Wheat | Jul | Oct | 6-7 | 16 | 2,903.3 |
| Rice | Dec | Apr | 6-7 | 16 | 8,268 |
| Soybean | Nov | Jan | 6-7 | 16 | 1,043.5 |
| Broadbean | Jun | Sept | 6-7 | 16 | 4,934.4 |
| | | | | TOTAL | 17,149.2 |
| EAA DAMANHOUR PLANT (BEHEIRA GOVERNORATE): | | | | | |
| Wheat | Jul | Oct | 6-7 | 16 | 7,957.9 |
| Rice | Dec | Apr | 6-7 | 16 | 8,675.4 |
| | | | | TOTAL | 16,633.3 |
| EAA BAHTEEM PLANT (KALUBIA GOVERNORATE): | | | | | |
| Wheat | Aug | Oct | 6-7 | 16 | 10,665 |
| Rice | Dec | Apr | 6-7 | 16 | 16,617.6 |
| Broad bean | Jun | Aug | 6-7 | 16 | 8,370 |
| | | | | TOTAL | 35,652.6 |
| EAA WADI EL NIL PLANT (KALUBIA GOVERNORATE): | | | | | |
| Wheat | Jul | Oct | 6-7 | 16 | 3,765 |
| Rice | Jan | Apr | 6-7 | 16 | 2,169.1 |
| | | | | TOTAL | 5,934.1 |
| EAA SHOBRA EL KHEMA PLANT (KALUBIA GOVERNORATE): | | | | | |
| Wheat | Jul | Oct | 6-7 | 16 | 3,877 |
| Rice | Dec | Apr | 6-7 | 16 | 3,600 |
| | | | | TOTAL | 7,477 |

| CROP | PROCESSING SEASON FROM | TO | DAYS/WEEK WORKED IN SEASON | HOURS/DAY WORKED IN SEASON | TOTAL TONS CLEAN SEED OUTPUT |
|---|---|---|---|---|---|
| EAA EL MINIA PLANT (EL MINIA GOVERNORATE): | | | | | |
| Wheat | Sept | Nov | 6-7 | 16 | 2,737.5 |
| Soybean | Nov | Feb | 6-7 | 16 | 5,175 |
| Lentil | Jul | Aug | 6-7 | 16 | 1,723.2 |
| | | | | TOTAL | 9,635.7 |
| EAA DEIR ASSIUT PLANT (ASSIUT GOVERNORATE): | | | | | |
| Wheat | Oct | Nov | 6-7 | 16 | 3,105 |
| Broad bean | Jun | Sept | 6-7 | 16 | 327.5 |
| | | | | TOTAL | 3,432.5 |
| ARC (EMCIP) SAKHA PLANT (KAFR EL SHEIKH GOVERNORATE): | | | | | |
| (data not available) | | | | | |
| Wheat | | | | | |
| Maize | | | | | |
| ARC (EMCIP) GEMMEIZA PLANT (GHARBIA GOVERNORATE): | | | | | |
| Rice | Feb | Apr | 6-7 | 12 | 1,940.1 |
| Wheat | Jul | Oct | 6-7 | 12 | |
| Maize | Nov | Jan | 6-7 | | |
| (Recently brought into operation; processing amounts are changing). | | | | | |
| ARC (EMCIP) SIDS PLANT (BENI SUEF GOVERNORATE): | | | | | |
| (data not available) | | | | | |
| Wheat | | | | | |
| Maize | | | | | |
| Berseem clover | | | | 20 | |
| ARC (EMCIP) SHANDAWEEL PLANT (SOHAG GOVERNORATE): | | | | | |
| (data not available) | | | | | |

NOTES:

1. Operating time includes not only actual processing time, but also time required for receiving/lot formation; clean-up between varieties; "down time" due to repairs, lack of spare parts, electrical failure; moving seed due to lack of adequate handling facilities and storage space; moving seed to processing due to lack of adequate receiving storage and handling space, and long distances from the plant; lack of labor; etc.
2. Most plants do not have data on actual output of cleaned seed per hour of machine operation.
3. Operating hours per day and operating days per week depend on the amount of seed to be processed and the time available Policy is to work 16 hours/da as required to try to get seed ready for the designated market. More daily hours are sometimes worked; in season, maintenance is done in off-hours and on Fridays.
4. Operating time also depends upon timing of seed harvest and delivery to the processing plant. Where very large amounts of seed must be processed, delivery scheduling/timing is often a major problem.

Due to the shortage of processing facilities, it is necessary to use all seed plants for all classes of seed. For example, the EMCIP plant at Sids was established to handle only Foundation seed; however, it presently handles all classes of seed for government programs and also processes seed for private companies. This practice is recommended in order to provide the required processing, minimize investment in plants, and gain maximum efficiency in operations and in amortizing the investment.

This year, the Sids plant operated 20 hours/day during the processing season (NOTE: seed processing, as most other agricultural processing operations, is seasonal, depending on crop maturity). The plant's volume of operations is shown by the fact that, although it has been in operation for a relatively short time--2 years, it has already worn out the clover deck of the gravity separator, which now needs replacement. Egyptian seed processing plants work long hours during seasons when seed must be cleaned quickly, as testified by the fact that facilities are inadequate and they still get most seed to farmers on time. However, the lack of facilities often prevents complete or adequate processing, and seed mechanical quality is not as high as it could be. It should be noted that personnel are not always paid for their extra hours/days of work during processing seasons. Improved records will help detail exact operating times and corresponding equipment wear and depreciation.

Maximum use of the investment in seed plants must be obtained, by using the facilities to the most effective level. However, it is poor management and poor balancing of fixed investment with operating costs if plants are constantly required to work long hours and long weeks. The facilities do not have flexibility to satisfy farmer needs in a timely manner (e.g., shift to a different crop/variety to meet unexpected demands, etc.), it is not possible to add new seed crops/varieties, labor costs are higher than corresponding capital costs of properly-used facilities, maintenance problems occur, seed quality is lower, supply of seed to farmers is seriously disrupted if mechanical/power problems occur, time required for clean-up is always a problem and "short cuts" result in mixtures and contamination, and management is less efficient when maximum effort must be given to getting out amounts beyond the normal capability of the equipment.

<u>PROCESSING SERVICES FOR PRIVATE SECTOR, FARMERS, & COOPERATIVES</u>: Since much seed is farmer-produced (including seed produced and supplied by small local farmer operations), processing services should be available to them on a "custom" basis; they cannot afford to build processing plants, even small-capacity units. This would be one of the easiest means of improving seed quality, building a seed industry, and promoting small-scale private sector development.

146

At this developmental stage, each government seed plant should have the normal margin of 50-100% extra capacity (which costs relatively little more to install and operate) so they can provide custom processing services in the early operating years of operations of farmers and local cooperatives which develop seed programs. This service should also be offered to both smaller domestic and larger international private-sector seed firms. They normally prefer to begin operations without first making the large investment required for a seed plant; this enables them to determine potential market growth more effectively, so plants/facilities can be constructed later and are better-suited to actual local conditions. This form of private-sector support has been practiced in many countries (e.g., Thailand) in developing private-sector seed supply; in Egypt, this was done to help establish Misr Pioneer and is still done to support smaller private seed firms such as several supplying clover seed.

However, lack of processing facilities, poor condition of equipment, and inadequate equipment in the few existing outdated and worn plants prevents adequate private-sector support. CAS and ARC try to provide custom processing services, but their capability is limited.

This problem could be alleviated, and private sector development encouraged, by establishing moderate-sized processing plants in strategic locations according to a well-designed dispersal plan, so they would be available to provide processing services for farmers and in initial operations of private seed operations. This would require a moderate number (small in comparison to many countries) of processing plants, at carefully-selected and widespread locations.

The investment required to make available a realistic dispersal of moderate-capacity plants throughout the agricultural areas of the country would be small, in comparison to its promoting or spin-off effect on development of seed production, private-sector participation, reduction of transport costs of seed, and reduction of genetic contamination through separating seed production of different varieties.

OPTIMUM PLANT CAPACITY: CAS considers 10,000 tons/year as the desired operating capacity for processing plants, based on the amount of seed they must put out; at this rate, the 1986 production of over 350,000 tons would require 35 plants. However, the actual need is greater, due to technical/managerial/quality-control constraints, and so that seed quality can be improved. The technical/management system, as in other developing seed industries, cannot operate efficiently and maintain high seed quality when operating capacities are that high. This is due to:

1. 10,000 tons/year is more than developing seed programs can supervise/handle at one location/center while still maintaining seed quality in the field. They cannot maintain quality and manage harvest/

delivery/handling operations efficiently in terms of cost and time, and safely in terms of seed contamination, deterioration and quality.

2. Seed processing is a seasonal operation, and must be completed between the seed harvest/delivery season and the seed marketing/planting season. 10,000 tons annual output requires hourly capacity or operating periods which exceed the management and logistic capability of most staff in developing seed programs to receive, form lots, feed into processing, handle out of processing, etc.

3. Seed equipment is manufactured in models whose capacities are usually economically practical under local--i.e., U.S. or European--conditions. To establish a high-capacity facility requires high investment in equipment which is more difficult to operate/maintain, and is more costly to install. Further, a few high-capacity facilities centralizes plants and requires excessive transportation of both unprocessed and cleaned seed, thus increasing seed costs, reducing seed availability and operating efficiency, and discouraging local seed production.

4. Operating personnel in developing seed programs seldom are capable of getting maximum capacity from a mechanized seed processing facility; they more readily and commonly get around 50-75% of seed (not grain) cleaning capacity. The result is that high-capacity plants in developing seed industries often cost more and increase maintenance problems, without equivalent ncrease in seed output.

In most countries with successful seed programs (e.g., Thailand), a seed processing plant--which is not only the processing plant, but also serves as the hub of the seed production/handling/supply program--is designed to handle 2,500-5,000 mt of seed per year. At this level, management personnel can balance all components of the seed program so operations are efficient and seed quality is high.

Farmer needs, agricultural patterns and locations, and seed industry operations/components in Egypt should limit plant capacity to 2,500-5,000 tons/year. To maintain efficient use of facility investments, provide growth potential and improve seed quality, plants should be targeted at 5,000 mt of high-quality seed per year with normal reserve capacity adequate to provide support service to the private sector.and handle some crop seed which presently are farmer-saved.

At this level, the present annual volume of 350,000 tons would require 70 processing plants. These, however, could not be integrated into the system in one operation at this time; they should be constructed only as all aspects of the program are updated and brought into balance, keeping in view the development of the private sector.

48

However, existing plants should immediately be upgraded so they can function properly, operate cost-efficiently, and provide the needed processing services.

OPERATING STAFF: Seed processing--if properly done--is a highly technical operation; it involves identifying processing needs of each lot, setting up the machines and flow sequence to make the required separations, adjusting the machines to get the desired precision, operating so as to minimize losses of good seed, and managing the work so as to minimize time required..

The manager, equipment operators, mechanic, electrician, and workers must all be well-trained in using the equipment, and then constantly re-trained to improve and maintain their processing efficiency and precision. A processing plant must have permanently-assigned, well-trained operators and workers.

Egyptian processing plants do not have permanent staff; they are operated by local labor contractors, who hire the cheapest-available daily-wage workers. Thus, the processing plants are operated by unskilled, untrained outside laborers who come and go as the contractor requires,, have no connection with the permanent program, know nothing of proper operation of processing, and know nothing of seed quality requirements.

This is further complicated by the fact that the labor contractor is paid on the basis of the amount of unprocessed seed which goes through the machines. The result is excessive processing loss, and less-than-possible quality of the processed seed.

One of the first management actions required to improve processing is to eliminate the labor contractor operations, and hire and train permanent staff--manager, operators, laborers/workers, mechanic and electrician--for each processing plant. Permanent staff--who can gain experience, be trained, and apply their training/experience to operate processing efficiently--are an absolute necessity.

CONSTRAINTS & NEEDS: Many existing processing facilities are old and require immediate replacement. Most are in poor condition, with inadequate equipment which interferes with efficient processing and creates dust and machinery hazards for personnel. Due to lack of facilities, it has been necessary to continue operating older plants which are now relatively poorly designed, worn, and in an advanced state of disrepair.

Nine existing plants were identified by Winrock/USAID as urgently needing to be replaced with more complete, cost-efficient equipment. Some plants require additional equipment to enable them to process seed

adequately. Some plants, including several of the new plants, require additional components and machines. Organization and management requires improvement as technical training of personnel can permit. There must be careful identification of additional facilities required, where they should be located, and type of equipment and facilities required.

There is no "custom" processing service available to promote private sector development.

There is not adequate reserve capacity or equipment to permit expanding seed production by taking on new seed crops.

Plants are not operated by permanent operators and workers; the daily-hire system results in poor operations, higher losses, lower seed quality, and increased processing costs.

More seed plants need to be located in different areas, to reduce seed transportation costs and help develop local seed production.

Scattered organization of government seed facilities prevents centralized operation to provide the best possible service. Seed processing facilities are dispersed among several agencies without clear lines of responsibility or authority. Coordination in planning, integrating and operating processing facilities needs to be developed, including placing all processing facilities administratively within a single agency to maximize efficiency, and provide "custom" services to other government agencies which produce seed (production would also probably improve in efficiency if concentrated in one agency which can locate larger quantities of single crop/variety production in specific areas).

Public-sector seed processing facilities do not operate under incentives which promotes efficiency, and payments received by these plants do not promote adequate maintenance or replacement. Managerial improvements would improve seed quality and operating efficiency. Nevertheless, new facilities will be needed (Winrock/USAID).

## SEED STORAGE

PBDAC has primary responsibility for seed storage. PBDAC owns the main warehouses where seed are stored, except warehouses at processing plants. In its distribution system, PBDAC has no special seed storage structures such as are normally used to maintain seed viability; seed is often stored in the open. At the processing plants, buildings used for seed storage do not meet technical requirements for protecting seed and maintaining seed quality. Much seed stored in the open, is stacked on the ground without adequate protection from sun, birds, or pests. Because of the administrative

requirements for accounting for waste materials created by processing, the waste materials are often stored in the warehouses while the seed is stacked in the open without protection from ground moisture, pests and weather.

CONSTRAINTS & NEEDS: Provisions for seed storage are inadequate, including sanitary measures to prevent damage from pests and loss of seed and/or seed quality. No seed storage facility is technically adequate for short, medium or long-term storage needs. Needed is a comprehensive review of seed storage requirements, construction of the required facilities, procurement of required equipment, permanent technically-trained staff, and adequate technical/management training for staff.

## SEED TRANSPORT

PBDAC transports seed, normally by arrangements with publicly-owned trucking operations. No special protective insulated vans or protective handling procedures/equipment are used; these are needed, especially when seed is transported in warm or rainy seasons. In most cases, however, weather is less of a problem than the handling methods. Time, damage/losses and cost could be reduced by transporting pallets loaded with seed bags as units, rather than manual handling of individual bags during transport.

CONSTRAINTS & NEEDS: Transport is inadequate to lift seed from growers at optimum safe times and deliver seed effectively to distribution points during the planting season. It is unlikely that seed quality is adequately maintained during transport and until it reaches farmers, or bags are maintained free from handling tears and pest damage.

## SEED PRICING

Seed prices for controlled crops (wheat, rice, barley, lentil, onion, soybean, groundnut, and sesame which are required to meet social objectives of food supply) are established by government through the CAS, for both prices paid to contract seed growers and retail prices charged to farmer-seed-users. Controlled-crop seed are sold at prices heavily-subsidized by government. Selling prices do not recover costs; in 1985, LE 3,500,000 was spent on wheat seed subsidies, and LE 1,500,000 for other subsidized seed.

Seed prices for non-controlled crops are not controlled or subsidized; these include corn and sorghum handled by the private sector, as well as most vegetable and forage crop seed; much of the vegetable seed is imported. Selling prices of non-controlled seed more nearly reflect market influences, which helps attract private-sector interest in these seed crops. Table 34 shows data on seed prices.

CONSTRAINTS & NEEDS: Prices paid to seed growers have not provided adequate incentives for high quality or complete delivery; prices charged for Certified seed have often been lower than ordinary grain prices on the open market, leading to waste of the investment in seed. Grower prices should ensure complete delivery to the seed program, while selling prices should recover costs and provide incentives for private-sector participation. However, it is unlikely that adequate cost-covering prices can be charged for high-volume low-value seed until intensive "seed awareness" promotion has been conducted for several years. Subsidies for controlled crops must continue under present conditions, but should be adjusted to permit reasonable pricing of seed.

TABLE 34
SEED PRICES FOR FIELD CROPS & VEGETABLES
(Source: CAS, 1987)

| CROP/VEGETABLE | PRICE PAID TO CONTRACT GROWER (LE/ardeb) | PRICE PAID BY USING FARMER (LE/ardeb) | % INCREASE IN PRICE |
|---|---|---|---|
| Wheat | 35.00 | 43.82 | 25.20 |
| Barley | 33.00 | 40.50 | 22.73 |
| Bean, broad | 65.00 | 82.00 | 26.15 |
| Lentil | 170.00 | 190.00 | 11.76 |
| Onion | 115.00 | 180.00 | 56.52 |
| Rice | 19.80 | 34.00 | 71.72 |
| Cotton | 6.955 | 9.05 | 30.12 |
| Maize | 35.00 | 61.56 | 75.89 |
| Sorghum, sweet | 100.00 | 114.40 | 14.40 |
| Sorghum, grain | 33.00 | 42.00 | 27.27 |
| Sesame | 123.00 | 140.30 | 14.07 |
| Groundnut | 48.00 | 48.00 | 0.00 |
| Soybean (NOTE: per ton) | 300.00 | 398.00 | 32.67 |
| | | AVERAGE INCREASE IN PRICE | 31.42% |

## MARKETING

Effective marketing and distribution of seed, as most other agricultural inputs, involve many transactions of relatively small quantity per transaction. Seed marketing requires promotion of the benefits of using improved seed, and contacting/convincing many farmers that they should use improved seed. This requires a massive, intensive, continuous educational promotion effort which reaches many farmers to create and maintain the demand for improved seed.

As normally defined, seed marketing does not exist. Seed is distributed to farmers, as part of the crop production credit package, through the Agricultural Credit Bank system and village cooperatives. Seed produced by the government program and the joint private-sector/government seed firm are distributed in this fashion.

CONSTRAINTS & NEEDS: There is presently no true seed marketing, in terms of promotional effort to create and then satisfy farmer demand. Seed are supplied as part of the PBDAC's credit package. If seed marketing were suddenly thrown onto the private sector and/or market forces, the lack of farmer seed awareness education and demand would cause drastic reductions in use of improved seed.

Needed is an extensive and effective extension/promotion effort to create farmer "seed awareness", especially if a private sector can be developed to assume a greater role in seed supply.

## SEED AWARENESS TRAINING & PROMOTION

No agency is conducting adequate seed awareness training and promotion among farmers; seed is essentially distributed as part of the credit package, without adequate intensive efforts to develop farmer understanding of (1) the importance of quality seed in crop production, (2) what seed quality is and how it is measured, or (3) how to get improved seed. As a result, no long-term demand for improved seed is being developed, and it would not be possible to free seed marketing to a dealer system or to expect the private sector to develop a major marketing capability.

CONSTRAINTS & NEEDS: Without extension-type "seed awareness" education and promotion, the seed industry cannot develop. Needed is a strong farmer education program on the benefits of using improved seed, what it is and how to get it. Either in the Extension program and/or the Ministry's seed program, a "Seed Extension Promotion Specialist" should work in each Governorate to help promote seed; his program should develop field demonstrations, sales promotion kits which can be used by others, posters, farm meetings, assistance and newsletters on seed needs and seed supplies, guidance in

planning seed production, etc. He should also help locate supplies of improved seed and help get it purchased by the farmers who need it.

## DISTRIBUTION

Seed is distributed through the PBDAC system and village cooperatives. Seed is distributed primarily as loan in kind as part of farmer production credit, or farmers are required to use Certified seed in order to obtain production credit. PBDAC is the distribution agent, delivery system, and retailer of processed seed. The seed distribution system often requires farmers to take seed to obtain fertilizer or credit.

On orders from CAS, PBDAC distributes processed seed to the village bank level (agency store), where they are soid to farmers for cash or on approved credit. Physical distribution is accomplished by public-sector transport arranged for and financed by PBDAC. Seed are sold to farmers at established, subsidized prices. Table 35 shows the number of PBDAC seed distribution locations and the amount of seed sold in each Governorate.

Seed produced by the joint government/private-sector firm is also distributed by the agricultural credit bank system, as is some seed from the privte sector; this makes these firms highly dependent on government, prevents their developing a marketing network/effort, and weakens their contribution to economic development of agriculture.

This procedure gets seed to farmers; however, it is effective because government subsidizes seed prices and farmers are required to take seed in certain cases. It achieves widespread distribution of seed to farmers and provides a means of rapid distribution of new varieties and can increase production significantly if seed quality is truly high. However, it does not develop farmer understanding of seed quality and its importance, or farmer demand for and desire to user higher-yielding seed. In the long-run, "forced" distribution without educational/ promotional marketing efforts will weaken acceptance of improved seed and the associated transfer of improved technologies.

<u>CONSTRAINTS & NEEDS</u>: There is lack of adequate processing facilities, which delays having seed ready, and causes poor coordination of distribution and marketing, with the result that seed are often not available at the optimum time for planting. Needed, in addition to improved equipment/loacation of seed processing plants, is an up-to-date and responsive coordination system to advise where/when/what seed is needed and to guide re-location of seed stocks during the planting season. This requires a data management and exchange system, improvements in seed transport and local storage facilities, and training of personnel.

TABLE 35
PBDAC SEED DISTRIBUTION OUTLETS & SEED SALES
(Source: CAS & PBDAC, 1987; 1985 crop data)

| GOVERNORATE | NO. OF VILLAGE BANKS | NO. OF VILLAGE SEED STORES | NO. OF OPEN-AIR DISTRICT SEED STORAGES | TOTAL SEED SOLD (ardebs*) |
|---|---|---|---|---|
| LOWER EGYPT: | | | | |
| Alexandria | 4 | [illegible] | 5 | 497,[illegible]00 |
| Behera | 74 | 40[illegible] | 41 | 161,712 |
| Gharbia | 53 | 333 | 47 | 134,236 |
| Kafr El Sheikh | 43 | 237 | 35 | 166,362 |
| Dakahlia | 68 | 446 | 51 | 208,824 |
| Damietta | 14 | 79 | 9 | 28,319 |
| Sharkhia | 68 | 457 | 51 | 166,277 |
| Ismailia | 5 | 32 | 9 | 5,272 |
| Suez | 4 | 12 | 2 | 535 |
| Menoufia | 39 | 308 | 37 | 51,657 |
| Kalubia | 40 | 207 | 16 | 14,858 |
| Cairo | -- | -- | 2 | 535 |
| MIDDLE EGYPT: | | | | |
| Giza | 30 | 185 | 18 | 4,204 |
| Beni Suef | 33 | 221 | 27 | 47,790 |
| Fayoum | 41 | 169 | 22 | 44,713 |
| Minia | 78 | 346 | 66 | 103,451 |
| UPPER EGYPT: | | | | |
| Assiut | 48 | 217 | 33 | 86,557 |
| Sohag | 54 | 282 | 22 | 57,216 |
| Qena | 45 | 218 | 16 | 20,425 |
| Aswan | 18 | 88 | 6 | 3,428 |
| TOTALS | 759 | 4,253 | 515 | 1,803,771 |

* Seed amount figures are in ardebs; the weight of an ardeb varies with crops, and is thus difficult to translate into kg based on data available.

## SALE OF SEED

PBDAC has primary responsibility for sale/delivery of seed. Seed is sold directly to farmers from village PBDAC/cooperative stores, as part of the production credit package rather than as the result of promotion and marketing. Most Certified seed does not go through a dealer system which generates farmer demand for seed. However, some locally-produced and some imported seed go through village dealer channels.

CONSTRAINTS & NEEDS: The present system appears to be adequate for supplying farmer needs if more seed can be produced, seed quality improved, transport expedited, local seed storages improved, and management information improved. It can get seed to many farmers, and thus provides a vehicle for rapid distribution of improved varieties. However, to develop a private-sector marketing/distribution/dealer system would require at least partial transfer of responsibility to the private sector.

## CREDIT FOR FARMER SEED-USERS

PBDAC is the principal source of credit for farmers to purchase crop production inputs, including seed.

A network of 17 Governorate Banks for Development and Agricultural Credit (GBDAC's) is supervised by PBDAC. The network includes some 5,000 village banks and agencies (supply units), and provides most agricultural credit for short-, medium-, and long-term needs. The number of locations where there are banks, stores which supply seed, and the amount supplied, are shown in Table 35.

Credit to purchase inputs, pay for casual labor, and purchase allied needs is extended in kind or in a combination of cash and kind, in general accord with the cropping pattern and input use prepared by MOA. While loan amounts per feddan are stipulated for each crop in detailed crop-enterprise budgets prepared by MOA, farmers can be selective in their choice of kinds and quantities of inputs, within limits. Table 36 shows planting rates allotted in government production credit packages as compared to recommended planting rates.

156

CONSTRAINTS & NEEDS: It is reported (Winrock/USAID) that farmers sometimes consider the allowed credit for seed to be inadequate for best crop yields under local conditions. After "seed awareness" extension-education training has been extensively given (but NOT before), greater freedom in credit and input selection should be permitted.

However, planting rates are already excessive, apparently due to inadequate education of farmers as to planting rates/field plant populations, as well as to lack of farmer trust in the quality of seed supplied. If seed quality is high, planting rates are excessive and wasteful and could be reduced.

TABLE 36
PLANTING RATES ALLOTTED IN GOVERNMENT CREDIT
& CROP PRODUCTION PACKAGES
(Source: CAS, 1987)

| CROP | PLANTING RATE RECOMMENDED (kg/feddan) | SEED ALLOWED IN INPUT CREDIT PACKAGE (kg/feddan)* |
|---|---|---|
| Artichoke | 4,000 (no. cuttings) | -- |
| Barley | 60 | 60 |
| Bean | 30-40 | -- |
| Bean | 75 | 60 |
| Bean, broad | 30-50 | -- |
| Beet | 3-4 | -- |
| Cabbage | 0.150 | -- |
| Carrot | 2-5 | -- |
| Cauliflower | 0.4 | -- |
| Chickpea | 60 | 50 |
| Cotton | 70 | 40 |
| Cowpea | 40 | -- |
| Cucumber | 1.-1.5 (nili, summer)<br>2.0 (winter | |
| Eggplant | 0.25-0.30 | -- |
| Flax | 60 | 60 |
| Fenugreek | 25 | 20 |
| Garlic | 200-300 (bulbs) | -- |
| Groundnut | 50 | 50 |
| Lentil | 80 | 50-60 |
| Lettuce | 0.50 | -- |
| Lupines | 75 | 50-60 |
| Mallow | 8-10 broadcast<br>4-5 in rows | -- |
| Maize | 15 | 15 |
| Okra | 12-20 (early summer, winter)<br>6-8 (late summer, nili) | -- |
| Onion | 7 | 3-5 |

| CROP | PLANTING RATE RECOMMENDED (kg/feddan) | SEED ALLOWED IN INPUT CREDIT PACKAGE (kg/feddan)* |
|---|---|---|
| Pea | 40 | -- |
| Pepper | 0.250 | -- |
| Potato | 750 (tubers, summer)<br>1,250 (tubers, nili) | -- |
| Radish | 5-8 | -- |
| Rice | 60 | 60 |
| Sesame | 4 | 3 |
| Sorghum | 10 | 10 |
| Soybean | 40 | 30 |
| Spinach | 8-12 | -- |
| Squash | 1-2 | -- |
| Tomato | 0.33-0.360 | -- |
| Turnip | 3-4 | -- |
| Watermelon | 1.0-1.5 | -- |
| Wheat | 75 | 60 |

* -- indicates that no crop production input credit scheme of specified input quantities has been developed.

## INPUT SUPPLY & USE

PBDAC is the principal supplier of agricultural inputs, including seed. Essential crop-production inputs (improved seed, fertilizer, plant protection measures/materials, and yield-increasing practices) are identified through ARC research programs, and assembled into technological packages. Proper use of on-shelf "packages"--including improved seed--could increase yields by 30-80%, according to analyses made for NARP.

CONSTRAINTS & NEEDS: It is reported (Winrock/USAID and CAS) that nationally-established packages do not always include what farmers consider to be adequate seed and fertilizer for maximum yields under certain local conditions. Under such conditions, production may be increased by allowing modification of the basic credit and input package to fit local conditions.

If government's apparent policy of increased privatization is to be implemented in this area, a major change in the input credit and seed distribution system is required to develop a private-sector distribution and dealer system. This will require that the private sector be responsible for

sale/distribution of privately-produced seed, and that credit is available for farmer purchase of privately-produced and distributed seed. Rather than the present supply of seed as credit in kind, the credit system could perhaps issue a purchase order to the farmer, who could take it to a registered private seed dealer and exchange it for seed (NOTE: to ensure delivery of improved seed, the government should register qualified seed dealers, and redeem credit purchase-orders only from registered seed dealers who provide adequate information as to lot number of Certified/ tested seed, etc.).

## CREDIT FOR SEED INDUSTRY

PBDAC acts as the financial agent for CAS to finance contract seed production, assembly and packaging of raw seed, and processing and packaging of seed by EAA and CAS. The PBDAC/CBDAC's also serve as the financial agent or credit source for some government seed production, specifically activities of the CAS. No regularly-available special credit or credit rate available to private-sector investment in seed supply has been identified.

CONSTRAINTS & NEEDS: The seed industry is a high-risk enterprise; without adequate special credit allowances, it is difficult to attract sufficient private-sector participation to have an economic impact on seed supply. Credit should be made available at concessional rates for reliable, registered seed programs which provide Certified seed, both government and private sector.

## PRIVATE SECTOR

The role of the private sector is an organizational issue frequently called into question. After 1966, government agencies assumed responsibility for producing and marketing seed of all major field crops. Forage seed, especially berseem, was left mainly to the private sector, and vegetable seed were handled by both private and public organizations. In 1980, government permitted maize seed to be produced by the private sector, and private firms and a joint government/private firm now produce virtually all Certified composite and hybrid maize seed. Private-sector firms also produce increasing amounts of hybrid sorghum and summer fodder seed (Winrock/USAID).

Policy decisions and implementations favorable to the private sector have resulted in establishment of several private seed operations for corn, sorghum, forage and vegetable seed. The private sector has long been involved in production and supply of vegetable and specialty seed such as berseem clover. In the last few years, 2 private companies were organized to produce maize, sorghum, and some vegetable and forage crop seed. Private-sector production of maize seed was encouraged by MOA and decisively

promoted by the 1981/82 withdrawal of CAS from maize seed production except for parental materials equivalent to Foundation seed.

Misr Pioneer (a joint government/private sector firm), Egypt Seeds (private sector), and National Seeds (private sector) now produce maize seed. Of the approximately 29,000 mt of maize seed needed each year (100% seed replacement), in 1985 these firms supplied some 8,000 mt of maize seed, more than half of which was hybrids. Misr Pioneer produces seed of a proprietary hybrid, while the other 2 firms produce seed of a composite and a double-cross hybrid. Each firm will have its own processing/storage facilities with combined capacity adequate for total farmer needs for maize and sorghum seed. Their maize seed production has increased to approximately 12,000 tons in 1987.

One large company is exclusively involved in berseem seed, and several small firms handle vegetable seed.

Hybrid seed for crops such as maize and sorghum, and certain forage crops, provide ideal opportunities for the private sector. Following extensive farmer "seed awareness" training, the private sector may also develop a comparative advantage in marketing and distribution of seed, even some which may be produced by the government.

To be attractive to the private sector, seed crops must provide a consistent return on investment ("profit"), which means that farmers must continually return to purchase seed (as opposed to saving their own seed) and be willing to pay a reasonably profitable price. Also required is consistent demand for a quantity of seed which can be pre-determined with some reliability, as "lead time" in supplying seed is 3 or more years. In general, low-volume, high-cost seed are suitable for private-sector operations; high-volume, low-cost seed are not. Private seed firms which operate in several countries and already have variety-breeding programs for specific crops, however, are often in a position to supply seed of crops which otherwise would not be suitable.

Some crops will probably never be attractive to the private sector; since farmers must have a reliable source of improved seed of all their crops if national needs are to be produced, both government and the private sector should be involved in seed production: government should produce low-profit public-service seed kinds, while the private sector produces other kinds. Table 37 rates some of the major crops according to estimated present potential for seed production by government or the private sector.

NOTE, however, that before the private sector can effectively supply quality seed, the requisite government service/support activities must be in place and effectively implemented. Also, as government-provided support services develop and the private sector has operated long enough to establish

161

facilities/marketing/production systems, some firms can take on other crops not previously handled, and broaden their seed supply.

TABLE 37
CURRENT ESTIMATED POTENTIAL FOR GOVERNMENT OR PRIVATE SECTOR SEED SUPPLY FOR COMMONLY-GROWN CROPS
(based on current potential; as conditions change and private-sector seed supply and variety breeding develops, its potential for seed supply of other crops will increase)

| SEED CROPS WHICH LIKELY MUST BE PROVIDED BY GOVERNMENT PROGRAMS | SEED CROPS WITH POTENTIAL SUITABLE FOR PRIVATE-SECTOR SUPPLY |
|---|---|
| Barley | Hybrids |
| Bean, broad | Bean, green |
| Chickpea | Cabbage |
| Cotton (in Egypt) | Carrot |
| Cowpea | Cauliflower |
| Fenugreek | Clover, berseem |
| Jute | Cucumber |
| Lentil | Eggplant |
| Flax | Lettuce |
| Lupines | Maize |
| Mallows | Melon & cantaloupe |
| Okra | Onion |
| Pea | Pepper |
| Groundnut | Radish |
| Rice | Potato |
| Sesame | |
| Soybean | Sorghum |
| Wheat | Spinach |
| | Squash |
| | Sugarbeet |
| | Tomato |
| | Turnip |
| | Watermelon |

CONSTRAINTS & NEEDS: Respective roles of the private and public sectors are not entirely clear due to lack of formalization of policy in a long-term manner; the resulting uncertainty probably discourages expansion of private sector involvement which could save considerable government funding.

For the emerging private sector, constraints are reported to include (1) problems and delays in importation of germplasm (parental lines) and their security; (2) inadequate supply of Foundation seed from ARC; (3) lack of personnel training and technical assistance; (4) lack of adequate hard currency to import needed equipment; (5) some uncertainties related to continuity of MOA policy on unimpeded private sector supply of basic agricultural inputs and withdrawal of CAS from maize seed production (Winrock/USAID); and (6) lack of adequate credit at appropriate rates and terms.

## SECTORIAL COORDINATION & COOPERATION

Support by government agencies to the developing private sector has been truly remarkable; however, this is primarily due to the attitudes and dedication of individuals, and could change with changes in personnel assignments. The private sector needs long-term guarantees of suitable policies, support, and operating freedom in order to make the long-term investments required for seed facilities. This requires not only formalized policy, but also formal mechanisms for coordination, and measures and approaches for cooperation and support.

CONSTRAINTS & NEEDS: To ensure maximum investment by the private sector, adequate supply of high-quality seed to farmers, best use of government funds, and coordinated integration of seed industry components, a formal policy and bi-sectorial mechanism for coordination among different agencies should be established. An association, club, or other organization which includes representation from every sector, component, agency, and firm involved in any aspect of the seed industry, should be formed and meet regularly to provide a forum for joint discussion/consideration of issues affecting seed supply. This could also serve as a sounding board for government policy, a means for government to keep up-to-date on industry conditions and problems, and a means for the seed industry to speak with one voice in requesting legislation, decrees, services, etc.

## PERSONNEL

CAS, the major seed program implementing agency, has a large number of personnel. However, their effectiveness is severely limited by inadequate technical training, working facilities, and operating funds. Available data indicate that CAS personnel (not including the Under-Secretary and his

advisor, both of whom have Ph.D.'s in Crop Breeding) have the following levels of training in 1984 (staff has since increased, without training):

1. Ph.D.: 0
2. M.S.: 0
3. Degrees in Seed Technology: 0
4. B.S.: 1,545 (none in seed technology)
5. Diploma in Agriculture: 1,650
6. Technicians: 48
7. Administrators: 1,000
8. Craftsmen: 698

There has been little or no upgrading training during the past 10-15 years; personnel have not been able to keep up-to-date or to renew or "brush up" their training.

CONSTRAINTS & NEEDS: It is unrealistic to expect efficient operations until adequate training is provided to all required levels of operating, technical, specialist, managerial, and working personnel. Adequate overseas training should be provided immediately to establish a reasonable level of technical and economic performance within the seed program, and a university-level Egypt Seed Technology Training Center should be established to supply the ongoing needs for trained personnel. Until such an adequate supply of trained personnel is established, the private sector should be permitted to draw freely upon the pool of trained personnel in the government seed program.

## TRAINING PERSONNEL

There is a pervasive, debilitating lack of training among personnel at all levels and an absence of training opportunities which contribute in a major way to the generally poor performance of the seed industry (Winrock/USAID). Current operating personnel do not have adequate training in up-to-date seed technology concepts and procedures; there is no source of training in Egypt; and there are no funds to send staff abroad for training. Not only are there inadequate numbers of trained staff in the government program, but there is also no pool of trained persons available to the private sector.

Few seed-program staff have seed technology training adequate to enable them to identify causes of problems and develop solutions; many do not have adequate working grasp of modern technology and how to use it to reduce costs and improve seed quality. It has been many years since adequate training was provided; in the meantime, applied technology has changed significantly and staff has not been able to keep up-to-date. Seed training needs appear excessive, but have only accumulated over time.

LEVEL OF TRAINING: Managers and Officers must have in-depth seed technology training to identify causes of problems and develop solutions effective under operating conditions. Short-term training, no matter how specialized, does not do this adequately for overall applied seed technology. Short-term training is ideal for upgrading technical skills and/or transferring specific improved technologies, but more in-depth training is required to create the overall grasp of technological operations required to coordinate and conduct a seed program.

Bachelor's-degree training is not acceptable: few persons without the B.S. are in responsible positions; the B.S. requires 4 years of study; potential trainees have not previously demonstrated academic competence.

Ph.D. training is required for research and in-depth training programs; however, for seed supply operations, Ph.D. training costs too much, keeps trainees away from their jobs too long; and, upon return, Ph.D's tend to seek other jobs and are not as valuable to the operating seed supply program in the long-run.

Master's degree training in seed technology provides the in-depth knowledge required, costs less, and requires only 2 years. Only persons with proven academic learning ability are sent. Upon return, Master's trainees have the knowledge and are more willing to work in seed program management and technical operations.

Adequate training is not available in Egypt. To permit rapid technical/economic improvements in operations of the present program, trainees for M.S. and Ph.D. in Seed Technology will be sent to Mississippi State University. MSU's Seed Technology Laboratory is widely recognized as the world leader in seed technology; it offers the most intensive and practical operation-oriented training available. Overall training costs are also lower than the USAID standard budgeting figure.

CONSTRAINTS & NEEDS: The primary cause of low efficiency and poor technical implementation in the seed industry is the lack of adequate numbers of persons trained to adequate levels.

Needed are (1) immediate training for the minimum number of persons required to operate the government seed program, and (2) priority establishment of an effective Egypt Seed Technology Training Center. This should be at university-level, and provide both university degree training (B.S., M.S., and Ph.D.) and in-service short-term training to upgrade and improve technical competence of staff as well as to impart specialized new skills in special short-term training programs.

## DATA MANAGEMENT

NEED: Foundation seed must be produced at least 2 years before seed is supplied to farmers, as it is followed by the Registered and Certified seed generations. This time lag generates considerable inflexibility, in that seed production requirements cannot be based on current farmer seed needs; they must be based on management estimates which in turn must be based on available information on seed use according to crop, variety, location, and season.

There is considerable inefficiency in the seed supply system, which affects all generations--Foundation, Registered, and Certified--because each generation depends on the previous/following generation, and constraints affecting one are affect others. The result is money invested in seed which is then not used, wasted seed, inefficient delivery and operation, and poor service to farmers.

With adequate flow of information, Foundation seed production could be organized so that lesser amounts are needed. This would result in smaller production areas and reduced seed amounts, so seed quality could be better-controlled and improved. This would result in concentration of Registered seed fields on State Farms, so roguing, harvest, post-harvest handling, etc., could be better-controlled and seed quality improved. This in turn would deliver better-quality seed stocks to farmer-contract-growers who produce Certified seed. This would lower their production (roguing) costs while improving seed quality.

The loads on existing seed processing facilities would be reduced, thus ameliorating the need for additional facilities and reducing delays in delivery of seed to farmers. Movement of seed to distribution points could be improved, with the result that less seed deteriorates in storage because amounts delivered more accurately reflect the actual amounts which can be delivered to farmers.

Better seed supply to farmers could be effected, with less seed and less cost.

FLOW OF MANAGEMENT DATA: The key to improvements in operations and planning is to improve the flow of data on which management decisions are based. Management decisions, even to determining amounts of Foundation seed to produce, must be based on data which begins at the level of seed distribution to farmers--data must "feed back" from the farmers who use the ultimate seed product. Partial modernization/computerization of the information system will yield no benefit, as a useful improved system cannot be superimposed on the old inadequate system; that this cannot be

successfully done in the Egyptian system is supported by experience in other seed programs (Brazil, Thailand) which improved their information flow through computerization of management data.

The existing system of reports and records cannot be modified or improved adequately to improve the flow of up-to-date information and provide more accurate information; it is too cumbersome, inadequate, and slow. Any improvement in data reporting and handling must be based on computerization

DATA MANAGEMENT SYSTEM Due to the large number of distribution points, it is not possible to include all needed sites involved in the seed supply and production system. The number of distribution points makes this completely uneconomic.

To computerize management data effectively at minimum expense, the minimum number of locations which can effectively improve management data must be selected. These must include central planning/coordinating offices, seed testing labs, seed processing plants, Certification offices, and major distribution points. These are the essential offices involved in and/or controlling seed operations and movement:

1. Offices at CAS headquarters which plan, guide, supervise, and coordinate seed production, handling and distribution.
2. Seed testing laboratories.
3. Seed processing plants.
4. Governorate offices which:
   A. Supervise seed production.
   B. Conduct seed Certification.
   C. Manage and control seed distribution.
5. Seed research (ARC) must also be tied into this system.

The miminum computerization of each office is a PC computer with a printer, so the office can analyze data and record it on diskettes. Diskettes with information can be carried from each office to the central data management unit, and *vice versa*. At the central office, computer facilities must be adequate to handle information from all the operating offices. The CAS Statistics Department now has an ICL ME 29 model 35 computer; however, its capabilities are said to be fully utilized utilized without providing the required management data; its data handling capability must be increased.

A data management software system must then be adapted, and new data recording/reporting forms created to accommodate computerization of data. The system must be compatible with both the PC's and the central mini-

computer; it must also permit computer-generation of the required summaries/reports to support management decisions.

While the cost of initial installation of a data management system is relatively high, it is small as data management systems run, and it will also have high returns in reduced seed costs, reduced seed losses, and more efficient supply of farmer seed needs. It is absolutely essential to efficient low-cost supply of higher-yielding seed to farmers.

PARTICIPATING AGENCIES: To effectively improve management decisions affecting Foundation, Registered and Certified seed supply, the management data system must include all concerned agencies. ARC, CAS, EAA, and PBDAC should be involved, including all agencies/offices concerned with seed production planning; Foundation seed; Registered seed; Certified seed; seed Certification; seed testing; seed processing; finance, budgeting, personnel, and administration; seed distribution; seed marketing; and seed data collection and preparation.

OPERATING AGENCY: The Statistics & Training Department of CAS already operates an ICL ME 29 model 35 mini computer, used primarily for "historical" data (as compared to "current management support" data). It reportedly does not have the capacity to add management data handling, as present use occupies its entire capacity. However, the core staff has experience in computerization, so this office should manage and operate the management data system.

OPERATING APPROACH: The data management system should be installed and operated so that frequent reports are submitted, with information flowing upward and downward through the organizations involved. These should show trends in crops/varieties with data which can be re-arranged to guide management decisions on: which seed to produce; what crops, varieties or hybrids are well-received and should be produced; existing seed stocks in terms of crop, variety, location, and unit; current demands for seed in specific locations and for specific crops/varieties so seed can be shifted from excess sites to deficit sites; seed cost data relative to different seed crops in different locations; cost and time of processing different seed at different locations, and other factors involved in reducing seed cost; quality factors associated with seed production and handling, so problems can be identified and seed quality improved; personnel assignments and improving their capabilities; etc.

A key use must be in analyzing management data to identify most efficient locations/procedures for seed operations. Improved report/record forms should be developed, to maximize use of the computers and minimize clerical work required at the various operating units.

IMPLEMENTATION: The first phase of installing a management data system must involve key seed program officials working with the hardware supplier to identify and develop existing software programs to provide the information flow needed to manage seed supply more economically.

Training courses must be conducted for key staff, which should include both computer operators and management personnel. When their initial training is completed, the staff should receive their data management equipment. The CAS Statistics & Training Department and the hardware supplier should guid/assist in setting up, converting, and operating the improved information system.

Essential data should be reported in computerized form (i.e., diskettes between distant sites and via cable connections at the CAS main office), on a weekly basis.

Management support analyses/summaries should be prepared and distributed to all concerned units of ARC, CAS, EAA, PBDAC, and the private sector. Data should be compiled and distributed immediately, so that it can have maximum management impact.

Primary emphasis of the data management system--and of all other activities--must be focused on creating an efficient, economic system to supply high-quality seed in a timely manner, be cost-effective, and be most efficient in developing government support programs and private-sector market-oriented activities.

CONSTRAINTS & NEEDS: Data collection, reporting, collation, and use to support management decision-making are now inadequate, loose, incomplete, and inadequately distributed; they do not now permit effective decision-making in seed production and distribution. As an example, data recently accumulated indicate that a significant amount of seed deteriorates in distribution channels rather than actually being distributed to farmers. The result is excess seed production, high seed supply costs, and production of excessive amounts of Foundation seed with consequent waste of resources, loss of researchers' time, and wasted land/operating costs on State Farms which produce Foundation seed.

A serious urgent need is to install and operate a complete management data system to report, collate and compile data from marketing, distribution, processing, production and planning

# VI

# THE NEED FOR DEVELOPMENTAL ASSISTANCE

## WHAT IS NEEDED?

Egypt's agriculture needs the support of a strong program to supply adequate higher-yielding seed. Today, the existing seed program is at a crucial crossroads: with adequate support to improve its facilities and operations, it can "take off" and become a model program, fully supporting increased food production. Without adequate support, its facilities--technical and material--will deteriorate even more rapidly.

A good basic program exists, but it urgently needs support in the form of:

1. Financial assistance, to develop efficient and adequate facilities required to build a program which can be organized and managed effectively. Without facilities to organize/manage, no policy/organization/ management improvements can be expected.

2. Training, to develop the technical and managerial competence required to operate and manage the facilities effectively.

With support in training and facilities, conditions will be created which can permit the program to be organized, managed, operated and implemented effectively.

## TIMELINESS

Development assistance can be provided in many forms at many times; however, it can achieve maximum effectiveness can be achieved only when local conditions and attitudes are right, so the improvements can be implemented.

The seed supply situation is now at a "critical mass"; it must either be improved on a significant scale, or sink further behind technologically and economically. Conditions and attitudes are now fully ripe for seed supply improvement:

1. Key officials fully recognize the importance of improved seed and current needs of seed supply operations, and are actively trying to secure support for improvements.

2. Present facilities have deteriorated, with the exception of some new units recently installed, in the normal course of use. The new facilities have served to call attention to the need for general improvements.

3. NARP has been initiated to expedite research to support agricultural improvement. It is recognized that research cannot have the desired impact unless it is transferred to farmers, and that seed is a primary technology-transfer vehicle.

4. Weak sectorial performance is recognized, and it is recognized that personnel lack training and that applied technology has lagged far behind.

5. Agricultural production has failed to meet the growing needs for food, and it is recognized that applied technology must be improved on an urgent basis.

Technological conditions, seed supply development, physical facility condition, personnel technical competence, and operations show critical need for a major overhaul and upgrading of the seed supply system. Attitudes of responsible government officials, identification of the needs, dedication and sense of urgency have created the conditions which make improvement not only necessary but also feasible and with high potential for success.

The time to improve the seed supply system is NOW. With adequate support so that the complete system can be improved now, the seed program can "take off", and help support and develop a productive agriculture. Without improvements in the very near future, the seed program will decline more rapidly in quality and efficiency; this decline will be reflected in agricultural production.

An effective, efficient, farmer-responsive seed supply is a complex integration of many components, each in itself complex. Technology, management, education, marketing/promotion, and socio-economic factors all affect performance and the ultimate goal of supplying improved seed to farmers.

Seed cannot be supplied to farmers by establishing one, two or a few components; a complete program is necessary, and development/operation of all components must be balanced and coordinated.

Establishing each component is in itself a long-term activity--policy, procurement, installation, construction, training, implementation, organization, records/reports, etc., must all be set up in a system which the operating staff can understand and manage.

Balancing the many components, integrating their activities, and developing them systematically in such a way that none "get out of balance" or are too different from the rest of the infrastructure, is essential but requires time.

The need for comprehensive improvements in seed supply infrastructure is clear and understood and desired by the responsible administrators, who also understand that it is a long-term process and requires--as do all successful beginning seed industries (e.g., India, Brazil, Thailand, Pakistan)--significant external inputs, and requires a long-term commitment on the part of the local government.

# VII

## IMPROVING THE SEED SUPPLY--OBJECTIVE

"Many problems confronting seed industry development result from failures to fulfill the purposes, intent, and provisions of the Seed Law. These failures can be attributed, in large part, to an array of deficiencies in resources, methodologies, expertise, organization, and economic policies" (Winrock/USAID).

The NARP seed component seeks to implement corrective measures to initiate the long-term process of overcoming these constraints, so improved technologies resulting from ARC's NARP-supported research can be effectively and generally transferred to farmers without loss of time, quality or productivity. The objective, goal, and purpose is:

*To supply adequate amounts of truly better seed to a majority of farmers to enable them to produce higher crop yields, which result in*

*Rapid, efficient transfer of research-developed technologies to farmers,*

*THEREBY*

*Improving living standards of farm families,*
*and*
*Improving use of limited agricultural lands,*
*and*
*Reducing the national food/feed deficit.*

# VIII

## EXPECTED STATUS AFTER IMPROVMENT

It is most feasible to implement seed supply improvements step-by-step, in a time-phased sequence of 3 periods of activities, each building on accomplishments of the last. At the end of the 3 phased periods of balanced, coordinated and step-by-step seed supply development described herein, the condition of essential seed supply components is expected to be as described below.

### SEED POLICY

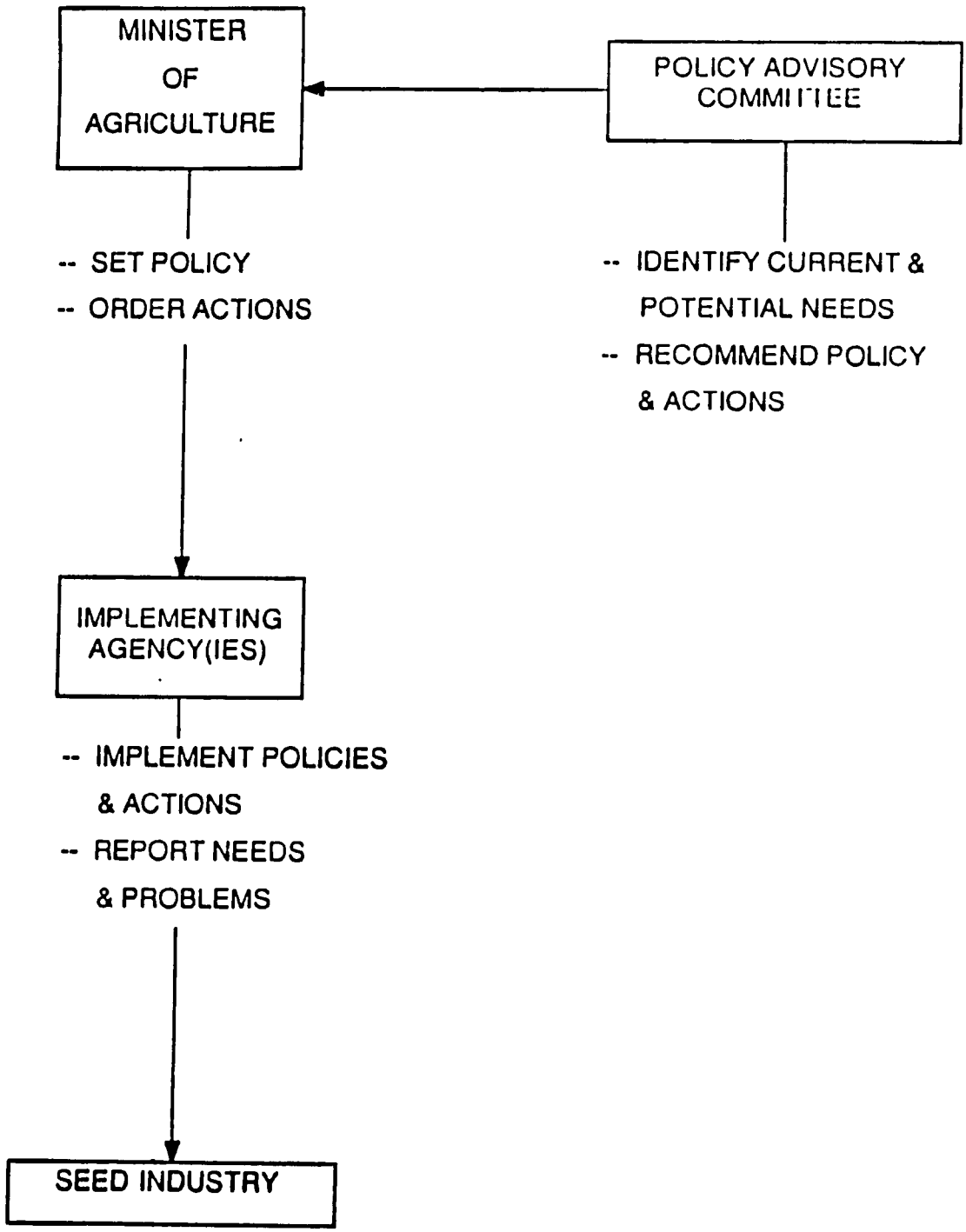
A formal National Seed Policy which is effective in the long-range and specifies government commitment to general use of higher-yielding seed, defines the role of seed in economic agriculture, spells out the roles of government and the private sector, identifies government support to seed-using farmers and the private-sector seed industry, and establishes government/private sector cooperation and coordination in seed supply. Policy will be overall in terms of application, covering specific needs as well as supporting and integrating seed industry components and agencies into the overall seed supply system and national agricultural and social-economic development policies.

The policy should be formalized in a manner which ensures that it will remain effective over the long-term, to encourage the long-term investments required to establish an efficient, stable seed industry.

### POLICY GUIDANCE

To include all pertinent considerations and keep policy current with needs, a National Seed Advisory Committee is needed, with representatives from MOA seed and variety development agencies, the private sector, and other Ministries and government agencies whose activities influence seed and agriculture.

This body will develop policy recommendations to submit to the Ministry for consideration and implementation as policy and/or action, keeping in mind overall and long-term needs of agriculture, national food/feed/fiber requirements, government activities and funding, and private-sector potential. It will help keep the Ministry aware of emerging and potential needs/conditions which influence agriculture, and identify approaches most suited to overall needs, both immediate and long-term.




SEED POLICY DETERMINATION AND IMPLEMENTATION

(10/87-5)

## POLICY IMPLEMENTATION

National seed policy as formalized by the Ministry will be implemented by both government and private-sector agencies which are formally assigned specific responsibilities through long-term seed policy. A special Seed Policy Implementation Section will be established as a staff advisory group in the high-level Ministry office responsible for implementing the national seed supply program. This Section will continuously observe, evaluate and analyze operations, implementation and needs, and serve as a technical/ implementation advisor to the Ministry and to the National Seed Advisory Committee.

## SEED INDUSTRY DEVELOPMENT PROMOTION

Maximum emphasis and support will be given to identifying those activities in which the private sector can function effectively, and to encouraging private sector participation. Support will be formalized, having the effect of law, and will be dependably effective over the long-term.

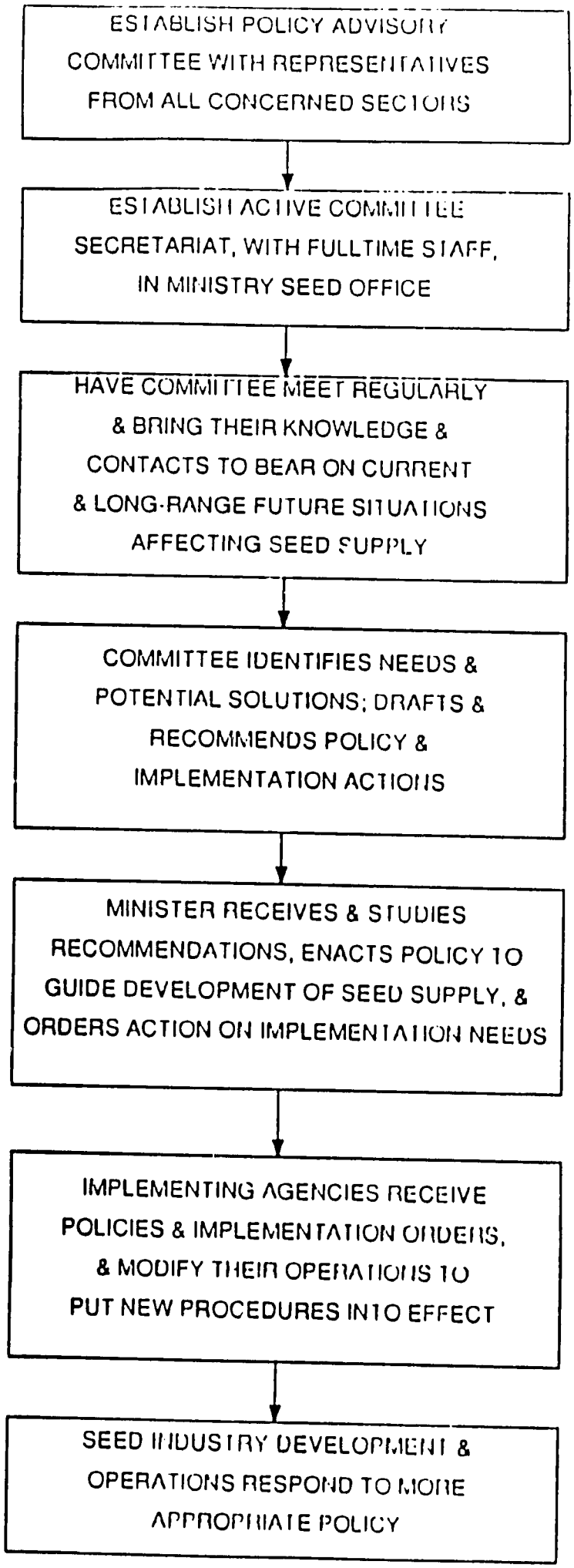
In the main office of the CAS, a special Seed Industry Development Office will be established to promote and assist private sector seed investment and operations. It will also serve as the Secretariat of a new National Seed Association (Club, Organization, etc.) which brings together both government and private-sector seed entities.

## SEED INDUSTRY ORGANIZATION & INFRASTRUCTURE

Recognition that a seed supply industry involves many different but inter-dependent and inter-related operations is essential. The overall seed supply infrastructure must be critically evaluated and re-organized to ensure that all essential components are in place, in balance, and functioning effectively. Government and the private sector must be assigned the roles to which they are most suited, and operating policies/procedures/systems established to maximize cooperation and coordination.

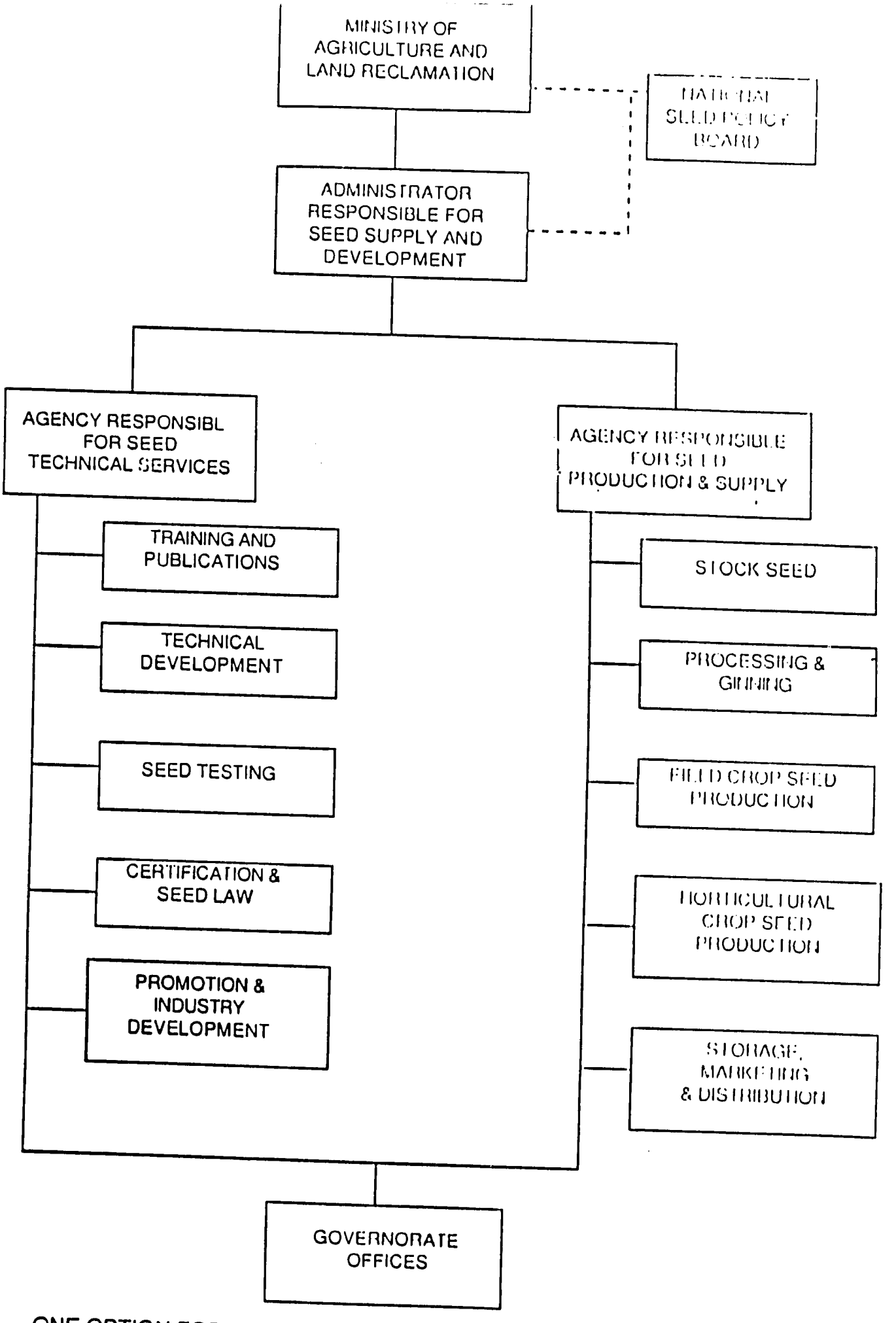
Government support and operating roles must be organized systematically and function-oriented so they provide complete and timely service at minimum cost to the government treasury. Where necessary, needed supporting roles will be established, performance of existing operations improved and made more responsive to private-sector needs, and coordination--rather than competition--will be maximized among industry components.

176




FORMING AND IMPLEMENTING REALISTIC POLICY ON SEED SUPPLY DEVELOPMENT

(10/87-12)




ONE OPTION FOR FUNCTION-ORIENTED ORGANIZATION OF SEED SUPPLY OPERATIONS

(10/87)

148

## SEED LAW

Existing seed legislation will be carefully analyzed by a committee with representatives from all concerned industry components of both government and the private sector, drawn from the industry and from the Seed Policy Advisory Committee and the Seed Association. A draft Law and/or Ministerial Decrees will be prepared for consideration which make seed legislation more applicable to current and anticipated future needs of both farmers and the seed industry.

## SEED LAW IMPLEMENTATION

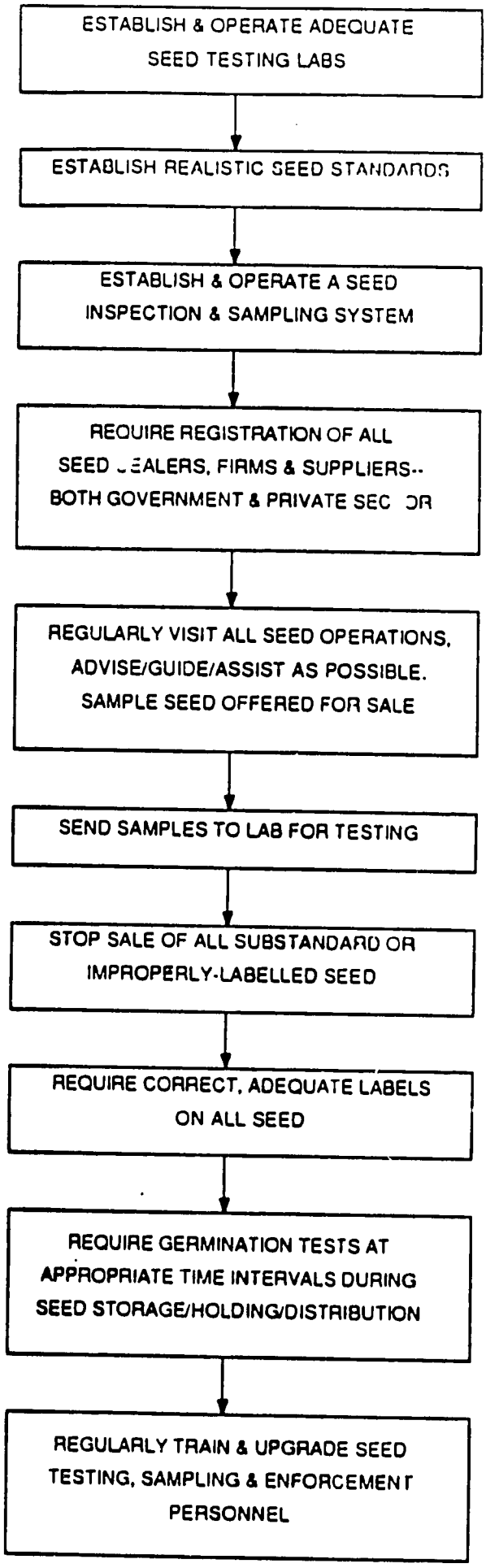
Implementation of the Seed Law will be strengthened by appointing a specific agency to perform specific tasks, and allocation of adequate personnel, facilities, and operating budgets. Seed production and supply will be supervised through a modernized Certification system and through sampling/inspection under the regulatory aspects of the Law. Specific seed sampling/inspection operations will be formally assigned to agencies with trained staff and adequate operating facilities. Seed testing laboratories will be upgraded in facilities and operations to support Seed Law implementation.

## GENETIC RESOURCES COLLECTION & PRESERVATION

Operations of the ARC FCRI Genetic Resources Section will be strengthened with staff training, equipment, facilities, organization and budget. It will maintain an effective stock of germ plasm, issue useful catalogs/descriptions, and will be integrated into the overall ARC research system both as a source of germ plasm for breeding research and as a repository of varietal and select breeding materials. A special ARC committee will be formed to study means of integrating the Genetic Resources facilities with medium- and long-term maintenance of Breeder seed.

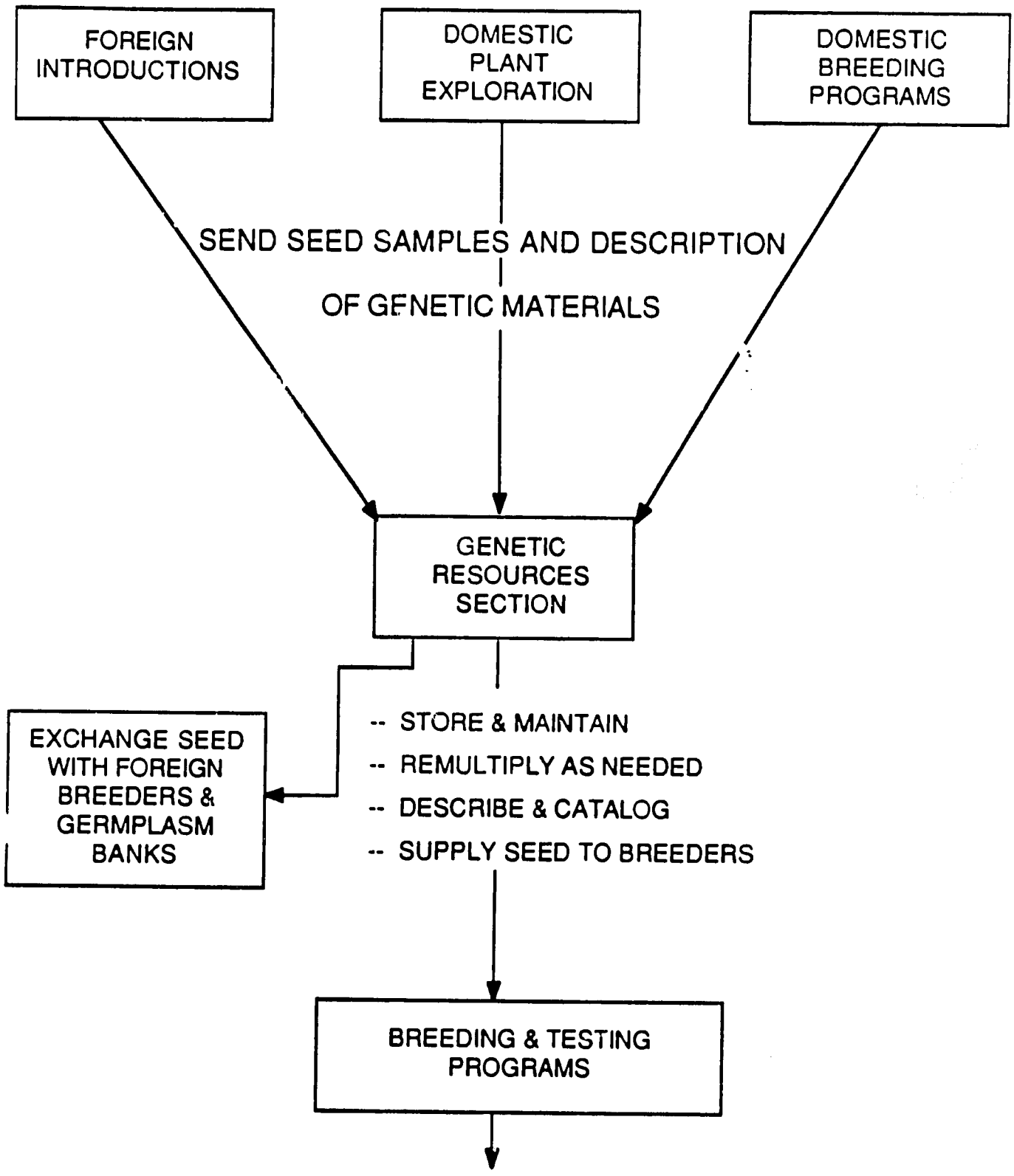
## SEED RESEARCH

ARC's Seed Research Section will conduct problem-solving and industry-development research to improve production, seed quality, seed supply, and seed industry operating quality and efficiency. Through a special Seed Research Advisory Committee, it will be kept up-to-date on problems encountered in seed production and supply. Orientation of the Seed Research Section will be primarily aimed at problem-solving and industry-development. It will cooperate closely with all concerned Research Institutes of ARC, with agriculture faculties of universities, private sector and government seed programs, and foreign seed research programs.



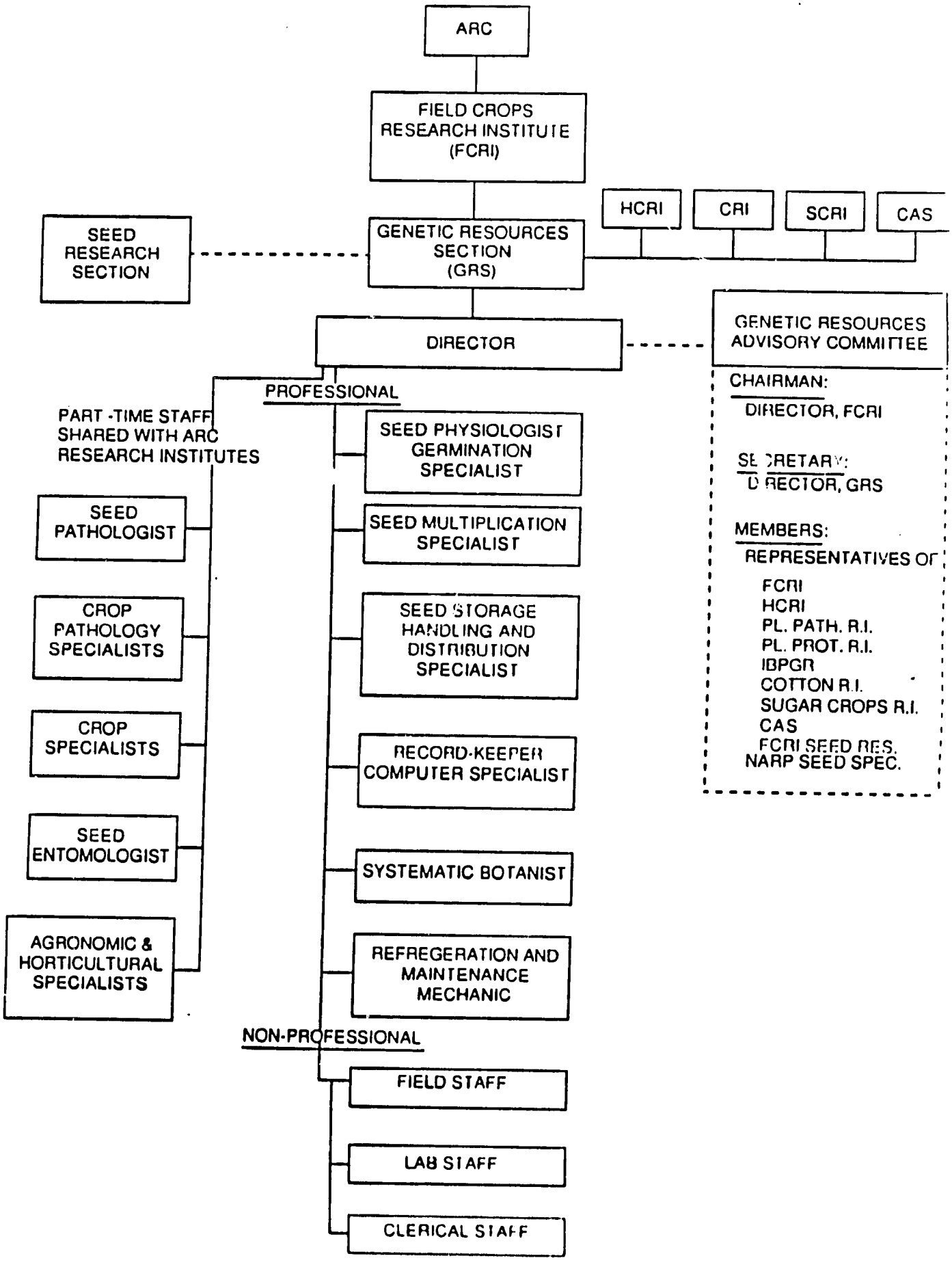

ACTIVITIES REQUIRED TO IMPLEMENT THE SEED LAW

(10/87-13)




COLLECTION, MAINTENANCE & SUPPLY OF GENETIC MATERIALS

(10/87)




ORGANIZATION TO MAINTAIN GENETIC RESOURCES

(10/87-2)

## VARIETY DEVELOPMENT

ARC's presently-strong variety breeding, introduction and development programs will be strengthened by support through NARP to its technical work, and its awareness of agricultural needs and problems will be strengthened by close coordination with the seed supply industry. Variety development will continue its focus on current and anticipated national needs for food/feed/fiber, and the needs of farmers who must fill these needs.

## VARIETY RELEASE

Release and recommendation of new varieties for specific areas/uses, and elimination of obsolete varieties, will be upgraded through a Variety Release and Review Committee to analyze materials and made recommendations to the Director of ARC. Variety release will consider technical aspects of specific genetic materials, needs of farmers, potential of the seed industry, and the need for a continuing flow of improved genetic materials.

## SEED PRODUCTION

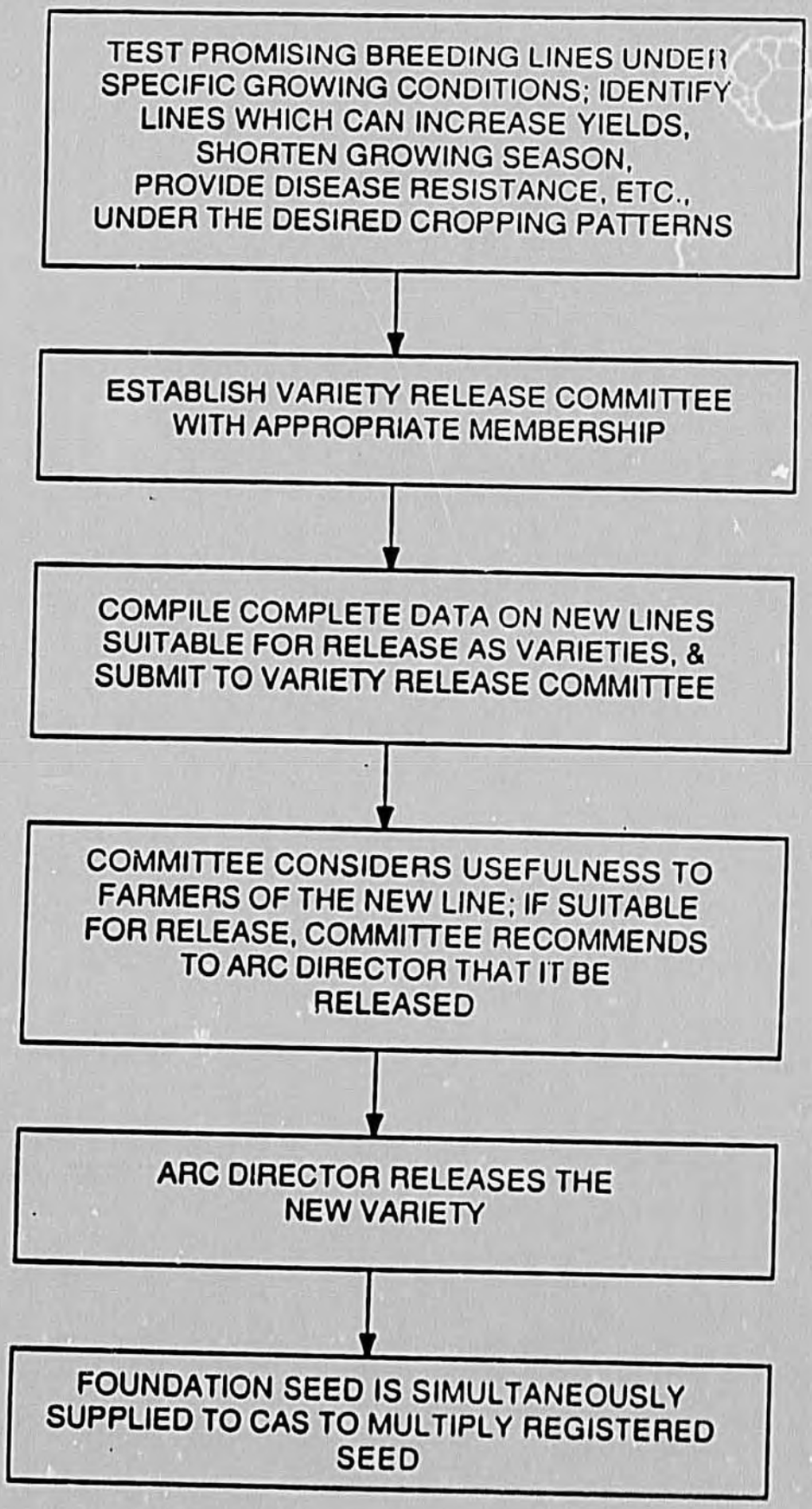
Seed production emphasis will shift from quantity to quality; as the private sector develops, it will receive maximum support to enable it to provide increasing amounts of truly high-quality seed. Seed production will be based on improved data on actual seed needs.

## PLANNING SEED PRODUCTION

While the private sector will be free to produce seed as it sees fit, within the quality requirements and development policies established by government to ensure orderly seed supply, efforts and mechanisms will be initiated to refine the planning of national seed production so that adequate seed is available to farmers and a suitable security reserve is maintained while avoiding over-production, imbalanced production, and other resource-wasting results of poor planning. Cooperation and coordination will be maximized in production planning, with meetings of all concerned public and private agencies to advise the planning group.

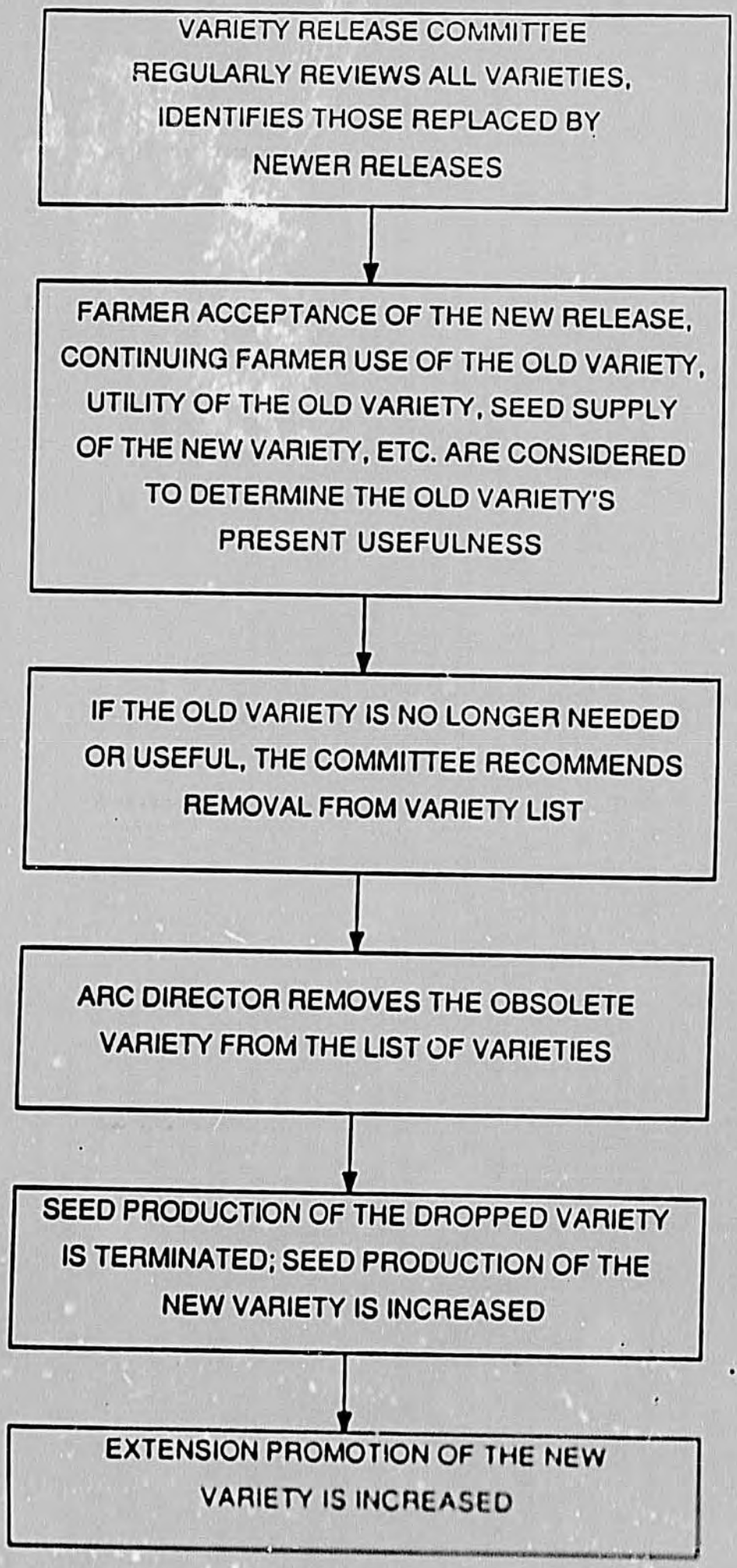
## SEED QUALITY

Emphasis on quantity will shift to emphasize quality adequate to help farmers get the desired stands of higher-yielding crops. Seed quality will be adequate to transfer research results to farmers without yield/quality-reducing mixture and contamination. As improved facilities, quality control and technologically-trained staff develop, seed quality is expected to improve while the seed reflect improved operating economies.



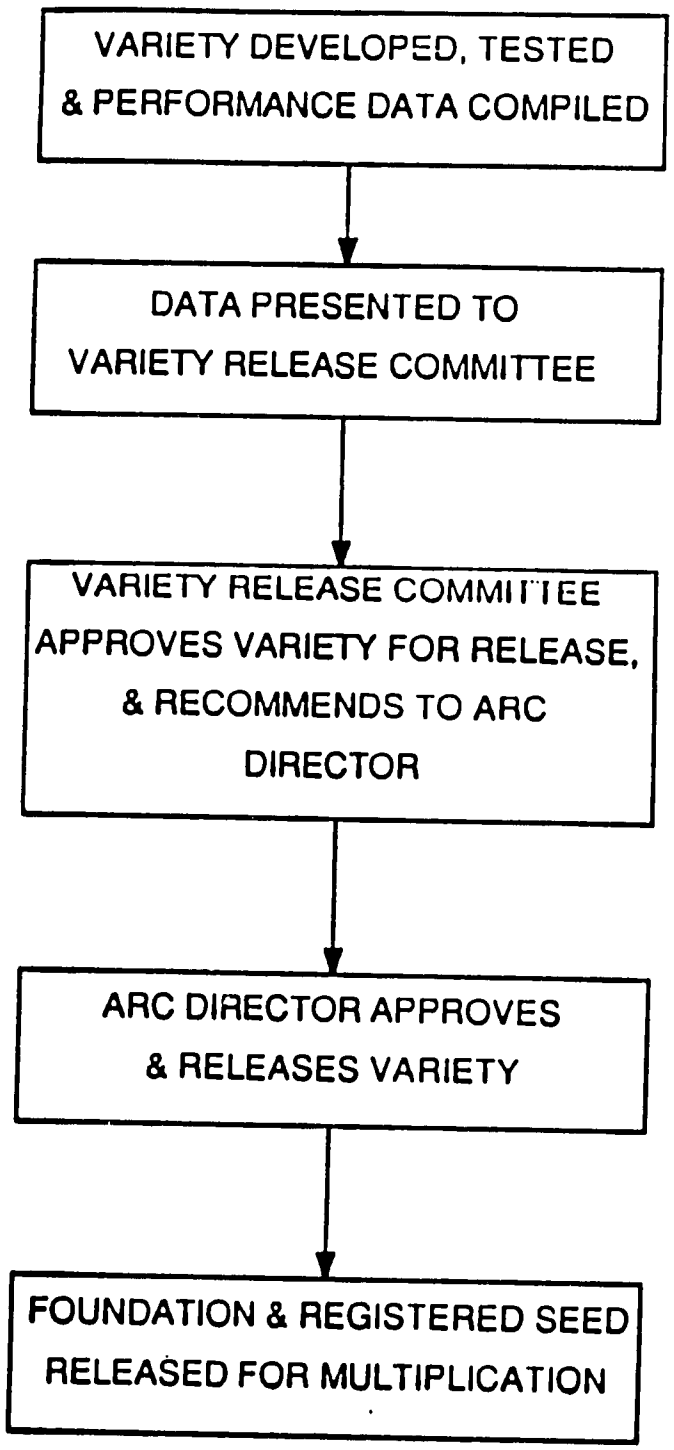

PROCEDURE FOR SYSTEMATIC REVIEW AND RELEASE OF NEW VARIETIES

(10/87-10)




STEPS IN REGULAR REVIEW OF VARIETIES AND DROPPING OBSOLETE VARIETIES

(10/87-15)




SEQUENCE OF RELEASING A NEW VARIETY

## SEED STANDARDS

An effective means of regularly reviewing and modifying standards to meet changing seed supply conditions will be established. Seed standards will be modified to reflect current production capabilities and growing farmer needs. A mechanism for periodic review of standards, and recommendation to the Ministry for changes under Ministerial decrees, will be established.

## SEED CERTIFICATION

Seed Certification personnel will be trained, operations improved/ extended/strengthened, facilities improved, the inspection/grower guidance/sampling system expanded and strengthened, and procedures streamlined to provide more frequent and technically-better supervision of operations to ensure higher seed quality and reduce loss of seed fields.

## SEED TESTING

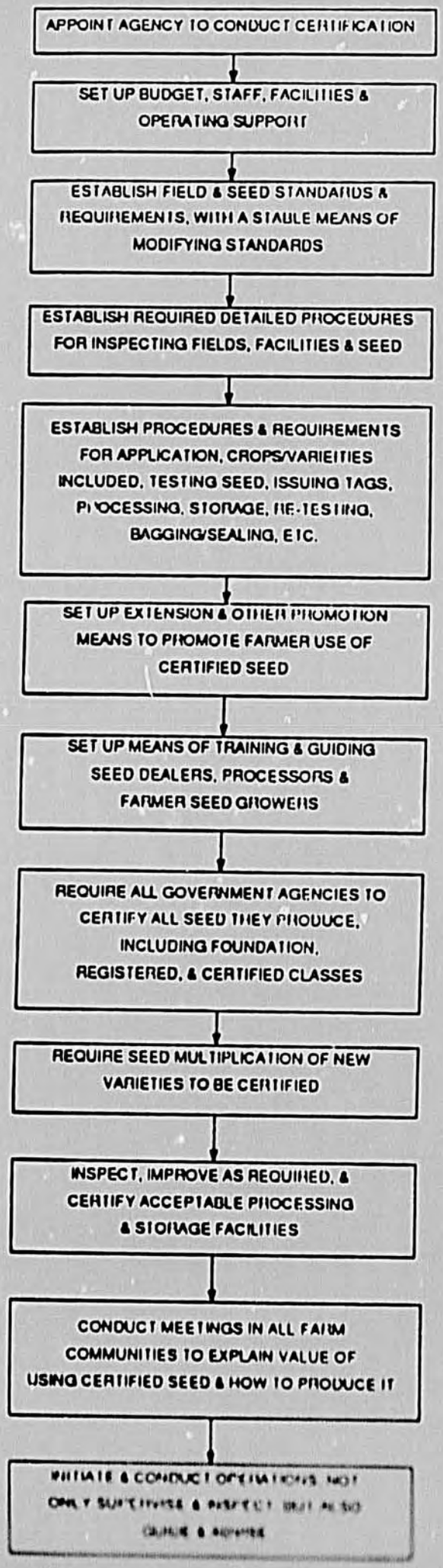
Seed testing services will be analyzed in-depth in terms of services required and location. Facilities will be established and upgraded as required, and services upgraded through technical training and supervision of personnel, improved facilities and equipment, improved recording/ reporting, expanded operations, elimination of unnecessary and less-useful tests, and adoption of more effective tests and procedures.

Testing services will be designed to provide accurate repeatable results without delay, to support the seed industry and ensure genuinely high-quality seed to farmers.

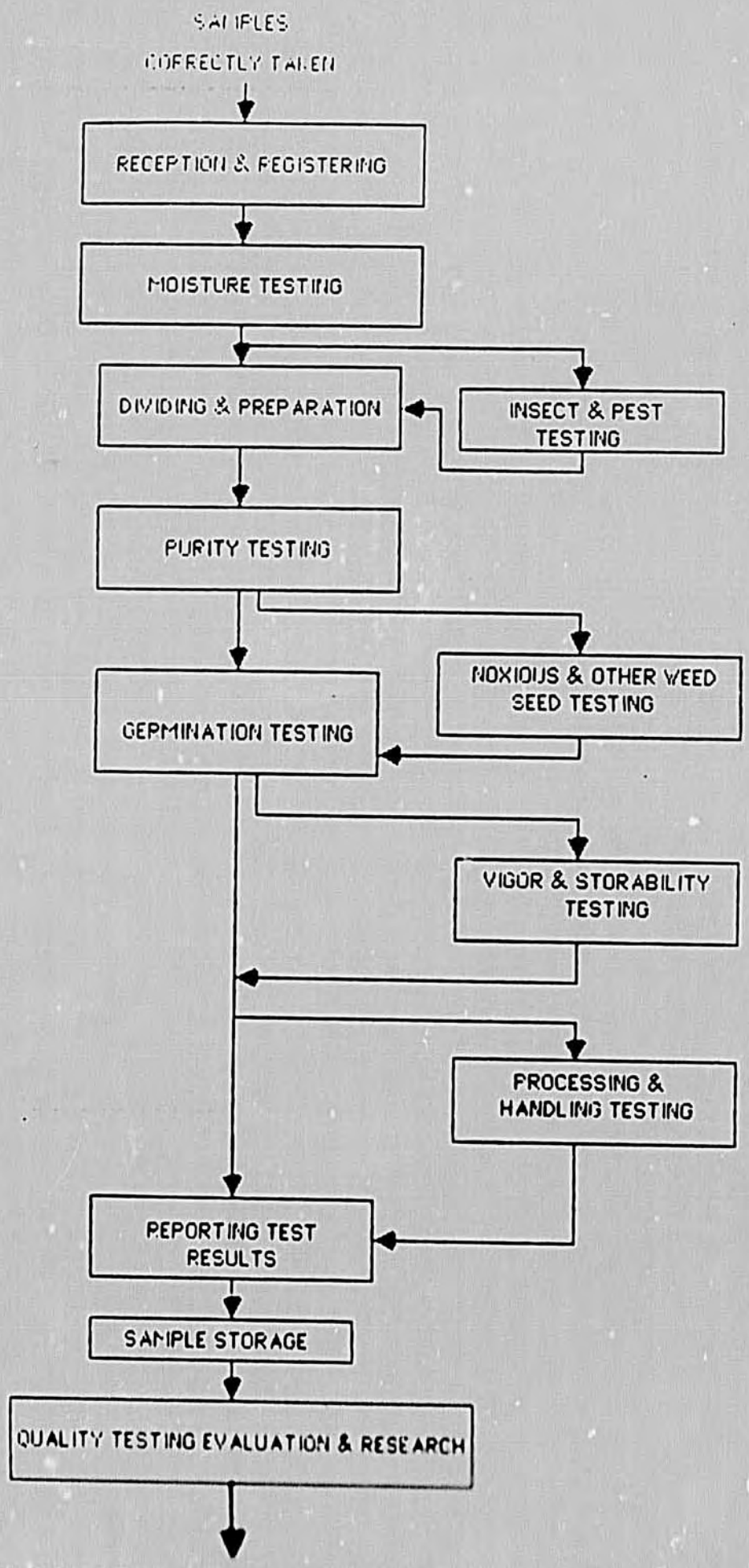
A mechanism and/or committee will be formed to review seed testing work regularly, make it more responsive to needs of the seed industry, and maximize its support to private-sector development and industry efficiency.

## REFEREE TESTING

A Referee Testing Section in the CAS main office will be strengthened through personnel training, facilities and improved operations. Internationally-standardized referee testing work will be maintained to improve uniformity of testing operations and train analysts. Both government labs and private-sector internal QC units will be included in the network of standardization, to ensure maximum test reliability and repeatability so farmer faith in seed quality can be maintained




OPERATIONS IN PUTTING IN PLACE AN EFFECTIVE SEED CERTIFICATION SYSTEM




OPERATING SEQUENCE OF SEED TESTING TO SUPPORT SEED SUPPLY DEVELOPMENT

## BREEDER SEED & VARIETY MAINTENANCE

Breeder seed production will be effectively organized, so that seed quality and genetic purity improves. Adequate amounts will be produced according to internationally-recognized efficient methods. An Advisory Committee will be established to advise on production quantities and kinds. A long-term storage system, utilizing the facilities of ARC's Genetic Resources Section, will be implemented to store valuable Breeder seed over the medium- to long-term to ensure adequate seedstocks, avoid loss of germ plasm, provide seed to meet unexpected needs, and reduce per-kg production costs. Breeder seed production will be organized as a special program to provide maximum assistance to breeders and minimize the time they must spend on day-to-day seed production operations.

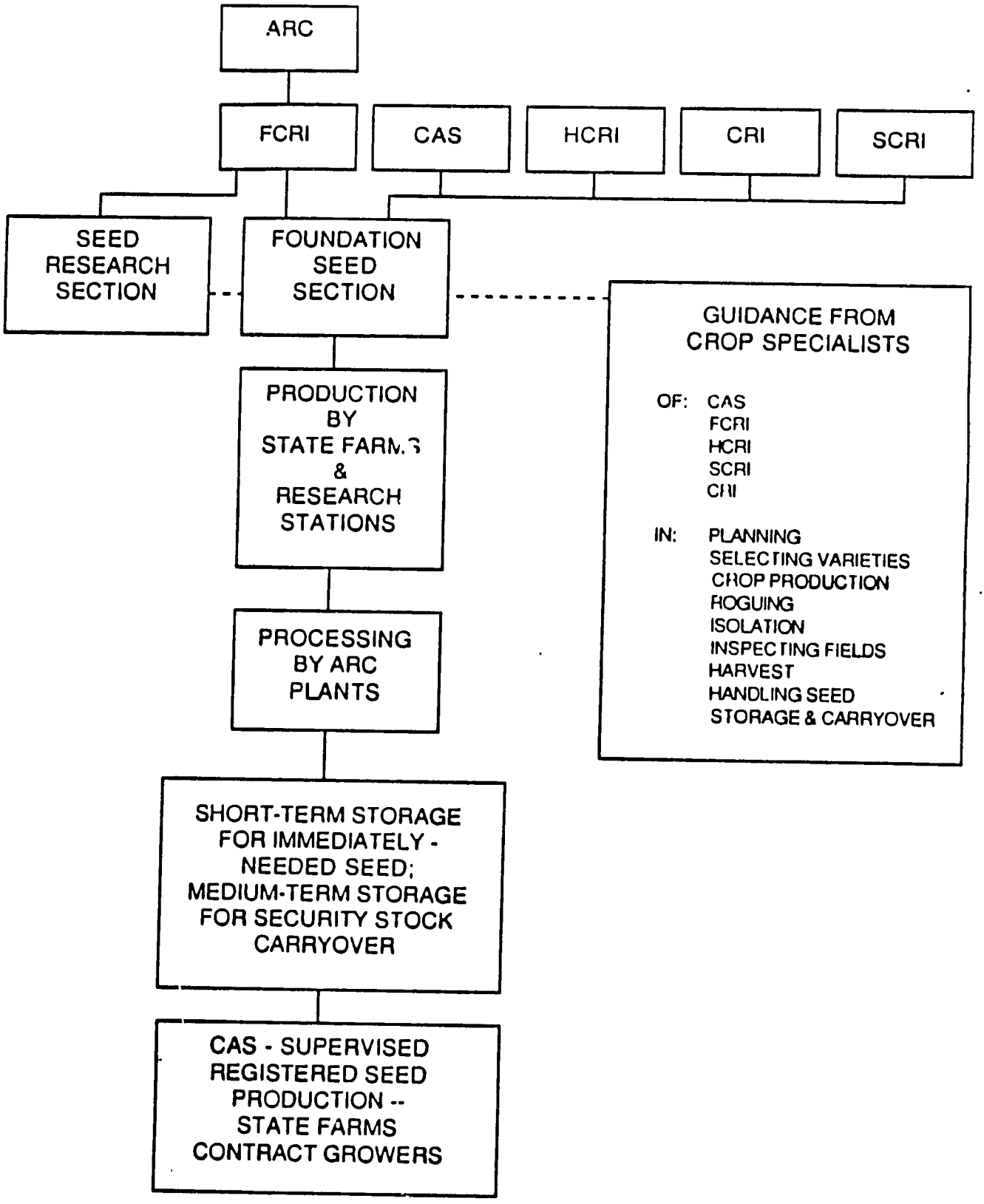
## FOUNDATION SEED

Foundation seed production will be organized so breeders are not required to waste their valuable time on routine operations. Seed supply will be maintained according to needs as advised by a special advisory committee; seed will be available to all public and private sector agencies which need Foundation seed for seed multiplication and supply operations. Crops and varieties maintained will be regularly reviewed, and seed supply/maintenance expanded to maximize service to the seed industry and seed-using farmers. Medium-term storage will be established so seed delivery can be assured at optimum planting times, and a security reserve of seedstocks maintained for emergency needs.

Seed quality will be improved through improved quality-control and Certification procedures.

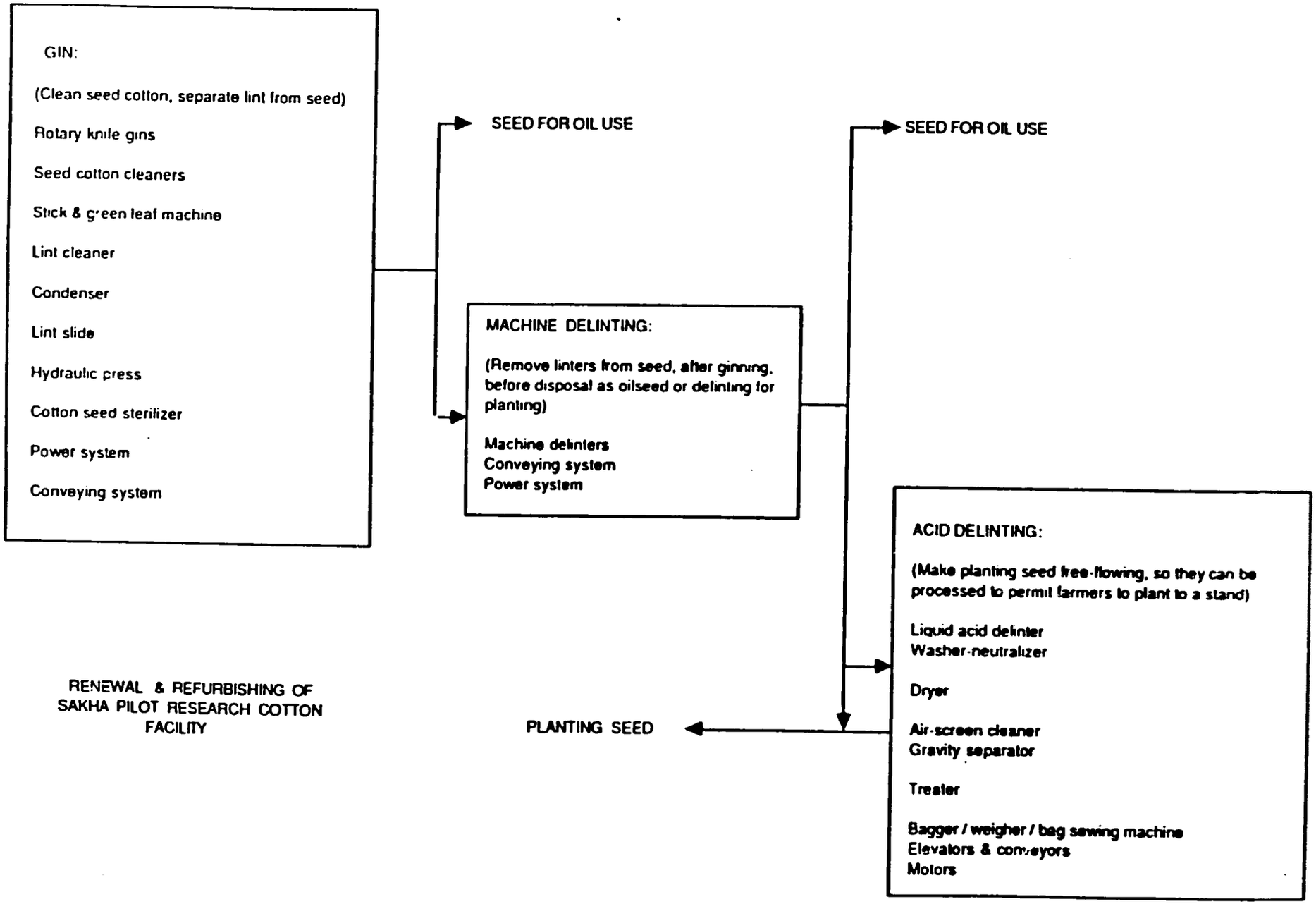
## DATA MANAGEMENT

To provide up-to-date data to support management decisions on seed production, processing, storage, transport, marketing, distribution, location of needs, costs vs. selling prices, etc., an effective data management system will be established. Enough government seed program offices to generate accurage management data will be equipped with PC computers, and the computer equipment of the central CAS Statistics Department will be upgraded to provide the required additional capacity. Appropriate software will be adapted and placed in use through staff training. Systems of regular and up-to-date inventory and status reporting will be initiated. The result is expected to be better management decisions, improved cohesion and coordination of the overall program, reduced waste of seed which will permit more appropriate production, reduced seed costs and improved operations




FOUNDATION SEED OPERATIONS

(10/87)




RENEWAL & REFURBISHING OF SAKHA PILOT RESEARCH COTTON FACILITY

## REGISTERED SEED

Registered seed production will be improved as personnel are trained and facilities improved, to provide higher-quality seed and fill needs of both government and private sector agencies. To the extent possible, Registered seed will be produced on State Farms by the Foundation Seed Agency. A system will be established to receive advance requests for Registered (and Foundation) seed to guide production.

## CERTIFIED SEED

Quality of Certified seed will be improved through training personnel, improving quality and frequency of inspections, sampling, and grower guidance, and improved application of quality-control services. The amount of Certified seed produced, and the crop seed certified, will be improved as the system can absorb it and farmers can be assisted.

Assignment of responsibilities and operating inputs to the Certification agency will be improved; operating procedures will be modernized so as to be more cost-efficient and need-responsive.

## SEED FIELD SUPERVISION & INSPECTION

More frequent inspections will be made, and better services will be provided. Certification work will be improved through improved organization and assignment of responsibilities, improved mobility and operating budget support to inspectors, and improved operating procedures. Improved coordination between the inspecting/certifying agency and the seed production agencies and contract growers will be established.

## TRANSPORT FOR "OVERSEEING" PERSONNEL

The problem of mobility for inspectors in production supervision, Certification and Seed Law implementation will be analyzed, needed improvements identified, and improvements in transport arrangements will be implemented.

## NON-CERTIFIED SEED

Non-Certified seed is a major part of the planting stock in many countries, and is expected to continue being important in Egypt. Seed Awareness promotion among farmers is expected to increase use of Certified seed, but large amounts of non-Certified seed will still be used.

Efforts will be made to improve the quality of non-Certified seed, promote training in seed awareness and seed production among farmers to help

improve the quality of farmer-saved seed; increase sampling/inspection/testing of non-Certified seed under the Seed Law to improve the quality of non-Certified seed; provide processing facilities on a "custom" basis, and/or help establish local processing plants for non-Certified seed to improve seed quality; and increase use of Certified seed as planting stock for non-Certified seed.

**PROCESSING**

Efficient, economically effective processing/storage facilities which can handle the nation's seed requirements must be established and brought into operation in a phased approach at the most suitable locations, as part of any re-structuring of the seed supply. Processing must permit adequate cleaning of seed at efficient per-hour outputs with minimum loss of good seed.

A minimum number of existing processing plants will be upgraded in the first phases, to provide the currently-needed processing capacity.

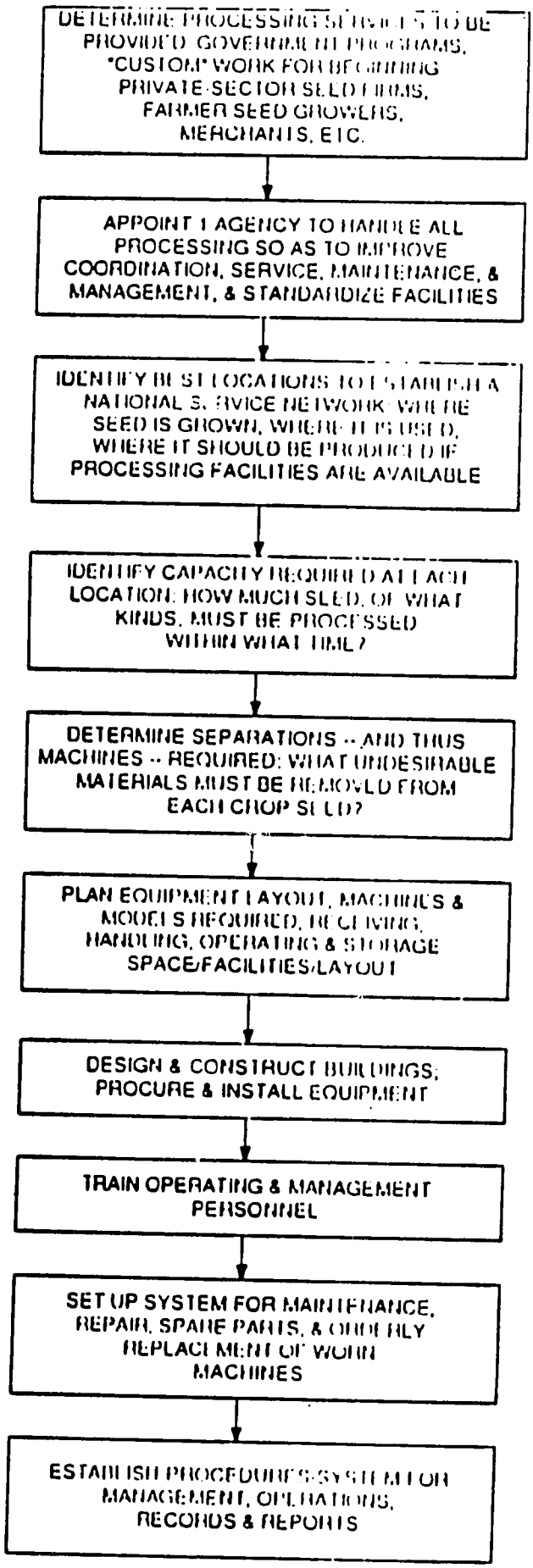
Total requirements for processing facilities will be analyzed, needs determined, and facilities established after needs are definitively identified. Processing/storage facilities will be appropriately dispersed so transport costs are minimized, seed supply to farmers will be timely and efficient, development of seed production can be encouraged, and emerging private-sector firms can be supported. Facilities will handle all classes of seed, with appropriate policy established as to priorities to ensure complete supply to farmers and to minimize investment costs.

Facilities will, to the extent possible, be standardized to expedite training personnel and maintaining/repairing equipment. The efficiency of assigning all government processing facilities to a single agency to improve operation and maintenance, with services provided on a custom basis for other agencies, will be evaluated and appropriate action taken.

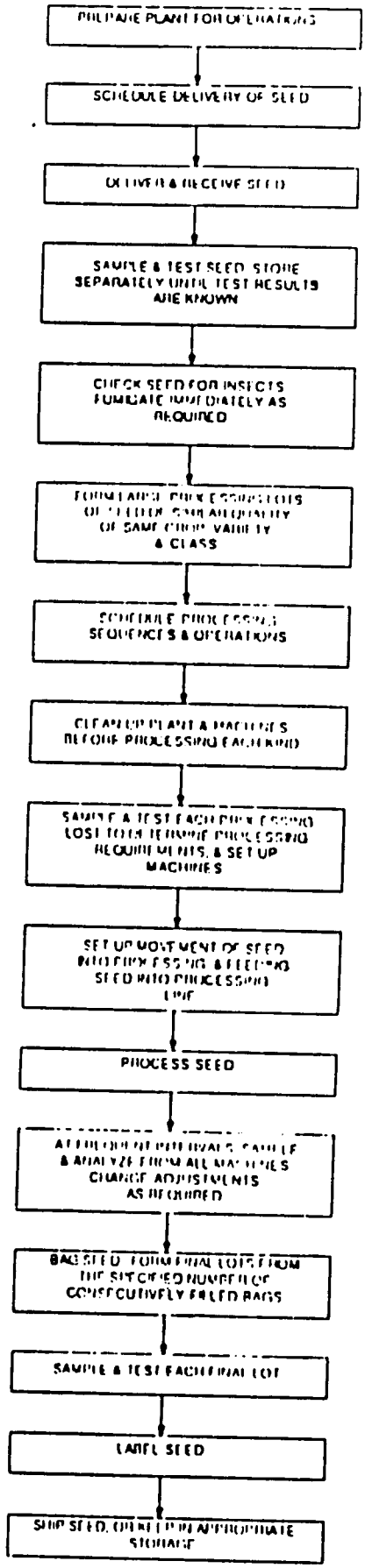
An organized management system will be established to ensure (1) efficient management and operation with maximum plant usage; (2) orderly replacement of worn/outmoded equipment; (3) that equipment and facilities are always suited to current priority needs; and (4) are of adequate economic and technological efficiency.

Permanently-hired staff--operations, workers, mechanic, electrician--will be hired and trained, and regularly upgraded to improve the cost-effectiveness of processing.

A coordinated spare parts/maintenance/repair system will be established. to the extent possible, private agencies will be encouraged to order, stock and supply equipment, parts and components




ESTABLISHING EFFECTIVE, REALISTIC SEED PROCESSING FACILITIES WHERE THEY CAN BE MOST USEFUL




MANAGEMENT SEQUENCE IN SEED PROCESSING

196

Custom processing services will be provided to private-sector operations, to help them establish seed programs without impossibly-high initial investment costs.

A plant will be developed to facilitate dispersal of processing facilities among the Governorates in a manner most suited to support private sector development, local acceptance and use of improved seed, and development of local seed production.

A computer-based record and report system will be established to help provide more complete management data, identify efficiency and output of actual operations, and support required maintenance and orderly scheduled replacement of equipment.

## STORAGE

Seed storage, at present technologically/economically/operationally unsuitable for short-term operations, will be critically evaluated as to volume, storage conditions, storage periods, and locations required to supply improved seed to farmers in all areas.

Improved storage designs will be prepared; existing storages will be modified to provide safer seed storage conditions; new storages will be constructed in accordance with technologically-suitable principles.

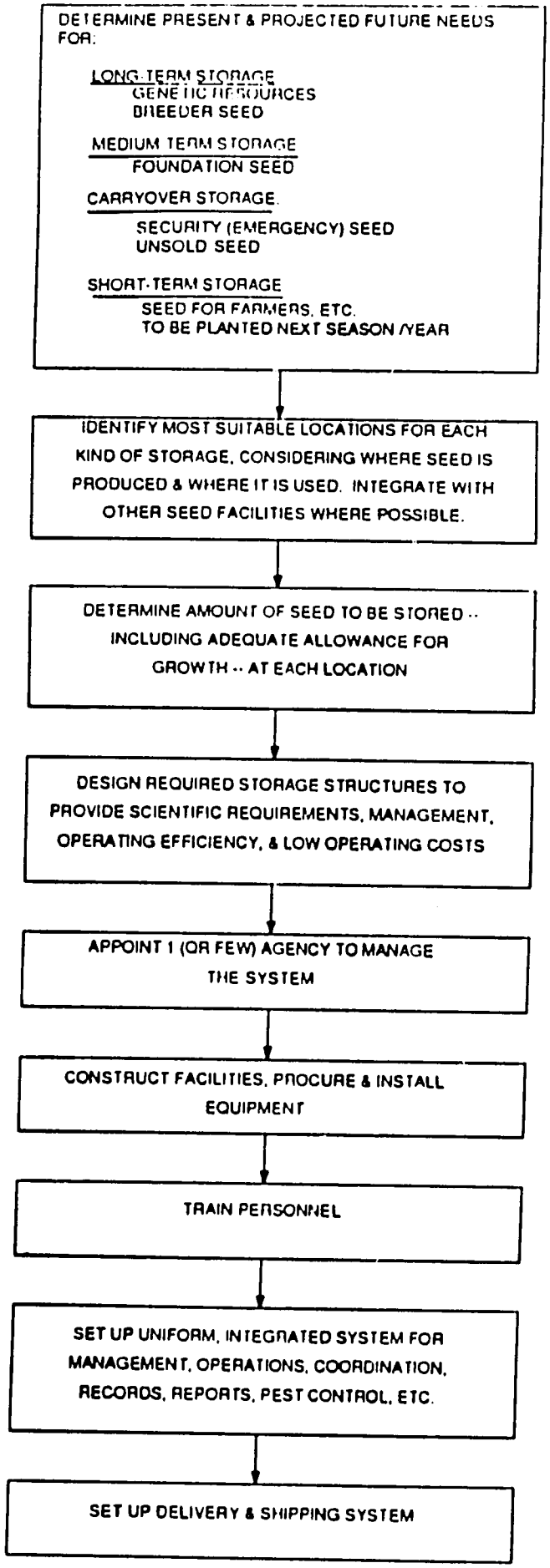
Adequate storage will be provided/improved in the locations needed. Storage locations will be selected so transport costs are minimized, service to farmers can be improved, and seed can be available where and when it is needed.

In addition to short-term storage, medium-term seed security storage needs will be evaluated and established. Long-term storage requirements will also be evaluated and implemented as required to maintain adequate seed supplies; if most efficient, this will be established in conjunction with the ARC FCRI Genetic Resources Section.

## TRANSPORT

Transport, which adds significantly to seed costs and delays in supply, will be minimized through establishment of seed facilities at the most suitable locations in areas where seed are used and/or produced.

Transport will also be improved by research on its effects on seed quality, and analysis of cost using public transport vs. special protective seed




(10/87-18) ESTABLISHING AN EFFECTIVE SYSTEM FOR STORING SEED EFFICIENTLY, WITHOUT LOSS

transport vans such as are used in other countries (e.g., Thailand), and implementation of helpful improvements.

Seed request and allocation procedures will be improved to improve seed transport between/among storages and farmer supply stores, especially during planting seasons, to improve availability and use of seed.

## PRICING

Prices of seed of controlled crops (which are controlled in order to meet social objectives) will, due to the nature of the objectives served, always be governed by efforts to subsidize production of the needed crops and ensure adequate supply. However, as possible, seed prices will be adjusted to more-nearly reflect actual costs; even if this added cost must be reflected in the amount of subsidy, it will permit more business-like management of the seed program. Seed prices of non-controlled crops will be allowed to adjust according to market influences, keeping in mind the need for higher-yielding seed, farmer ability to purchase higher-cost seed, and national benefits derived from using improved seed.

Regular studies of costs of seed production and supply, combined with detailed identification of cost factors, will be made. These will serve both as an input to updating prices and as a means of identifying economic improvements required in the seed supply industry.

## MARKETING

Seed marketing to create and satisfy a growing farmer demand for higher-yielding seed, will be developed and intensified. As contrasted to seed distribution without promotion, marketing will seek to improve farmer understanding of the benefits of higher-yielding seed and generate farmer desire and demand for better seed.

Marketing methods will be studied and implemented, in accordance with the potentials and requirements of the seed supply system, farmer credit system, and potential improvements and restructuring.

## SEED AWARENESS TRAINING & PROMOTION

As the critical long-term key to farmer acceptance/demand/use of improved seed, efforts will be initiated to promote "Seed Awareness" in Agricultural Extension work and agro-service industry operations. Training systems/materials/kits will be developed by appropriate agencies with technical assistance from CAS and ARC; this program will also implement training for farmers, agricultural workers, and rural merchants; help promote farmer use of improved seed; and work with seed supply agencies.

## DISTRIBUTION

The present seed distribution system will be analyzed in depth as to its efficiency in supplying seed, meeting planting needs in a timely and complete manner, maintaining seed quality, keeping current data on seed needs, and economic efficiency. Where possible, improvements will be identified and implemented.

Distributing Certified seed through other agencies--including a private-sector dealer/merchant system--to reach more farmers with improved seed, will be investigated.

The distribution system will be helped to increase and improve its promotional efforts and distribution activities.

## SALE OF SEED

Efforts, locations, facilities and procedures for selling seed will be analyzed and improved as possible to help supply more improved seed to more farmers, minimize delay, and reduce operating costs.

## CREDIT FOR FARMER SEED-USERS

The present farmer credit system is effective, but will periodically be cooperatively analyzed to identify improvements which can be recommended to the PBDAC for implementation. These should include possible supply of credit "in kind" vouchers for seed purchase from other registered and reliable sources such as private-sector merchants, stores and seed dealers.

## INPUT SUPPLY & USE

Efforts will be made to analyze the seed supply system, provide improved storage/handling facilities, and improve supply procedures in association with total input supply. Flexibility in credit for seed--especially credit in kind--will be sought to permit planting rates which do not waste seed but will promote maximum yields.

## CREDIT FOR SEED FACILITIES & OPERATIONS

To the extent possible under government investment incentive programs, concessional credit will be sought for the seed industry to finance both fixed investment and operating capital needs. This will be designed so as to promote private sector participation in seed supply, and will be tied to supply of high-quality Certified seed.

200

## PRIVATE SECTOR

Organized efforts will be made to identify actions needed to encourage private sector investment in seed supply, and then provide the conditions which make it effective in terms of both private objectives and development of the nation's agriculture and increased agricultural production. Policy will promote private-sector operations; government developmental, pilot-type activities and industry-support services will be improved technologically and in efficiency; government agencies will minimize competition in seed supply; and government support (e.g., stock seed, testing, processing, etc.) will be improved. A Seed Industry Development Section will be established in CAS, the primary government seed agency.

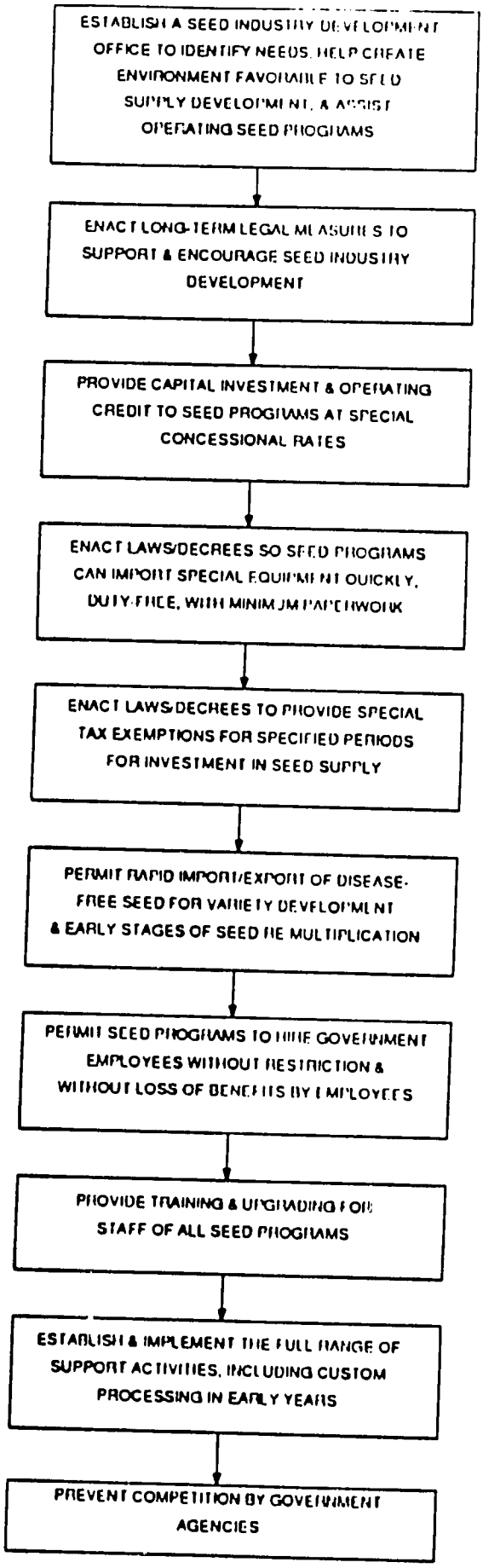
## QUALITY CONTROL

The sole purpose of a seed supply system is to transfer improved, higher-yielding genetic/physical/physiological technology to farmers. The seed must truly be improved and higher-yielding; to achieve this, however, is the most difficult component of a seed supply system; it requires constant upgrading of personnel competence, operating procedures, field and seed standards, facilities and equipment, credit supply, research support, technology integration, and program organization and management.

Improvements will be initiated in quality/yield-ability of seed supplied to farmers, and in efficiency and economy of seed operations. This will be achieved through improved organization, personnel training, facilities, quality control, supervision, and support to producers/processors/ distributors. Major efforts will be given to improving quality control systems.

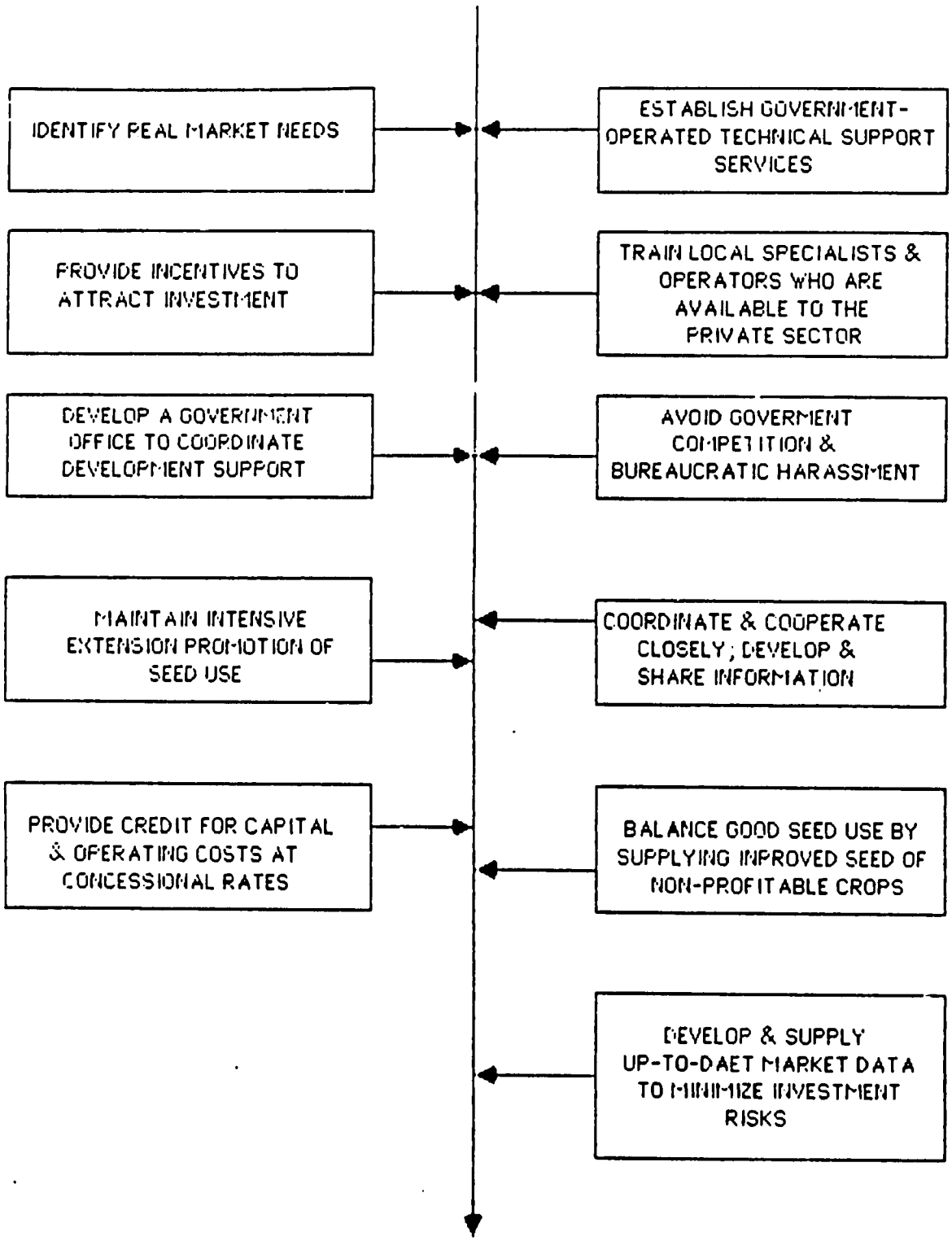
EXTERNAL QUALITY CONTROL: "External" quality control systems--Certification, Seed Law, etc.--will receive major strengthening through upgrading personnel with technical training; improved facilities; more updated operating procedures, etc.

INTERNAL QUALITY CONTROL: A major quality-control element is the "internal quality control system"--a quality control unit within the operating seed production program/company, seed processing plant, etc. Only with a functioning internal QC system can a seed program maintain the constant control required to ensure continued high seed quality. Basic facility designs, equipment requirements, operating procedures, etc., will be developed. All government and private-sector seed operations will be helped and encouraged to establish internal QC operations. Training courses on internal QC will be conducted, and manuals of procedures developed.




ACTIONS BY GOVERNMENT TO PROMOTE SEED SUPPLY DEVELOPMENT

(10/87-18)




GOVERNMENT ACTIONS REQUIRED TO INITIATE A PRIVATE-SECTOR SEED SUPPLY.

## SECTORIAL COORDINATION & COOPERATION

Coordination and cooperation, essential to integrated performance of the components of a seed industry, will be improved through formally-established mechanisms. This will include an Industry Development Office in the CAS; regular bi-sectorial meetings; private-sector personnel and representatives included in training programs, advisory committees, and planning sessions; etc. It will also include establishing a Seed Industry Association/ Club with representatives from both sectors, and formalization of policy to promote coordination and cooperation.

## PERSONNEL

Evaluation of personnel needs, competence, and location will be conducted. Efforts will be made to upgrade their technical competence and assign/support them in a manner which can improve their individual contributions to performance of the seed program. Job descriptions will be reviewed for training needs, assignment, etc.

## PERSONNEL TRAINING & TECHNICAL COMPETENCE

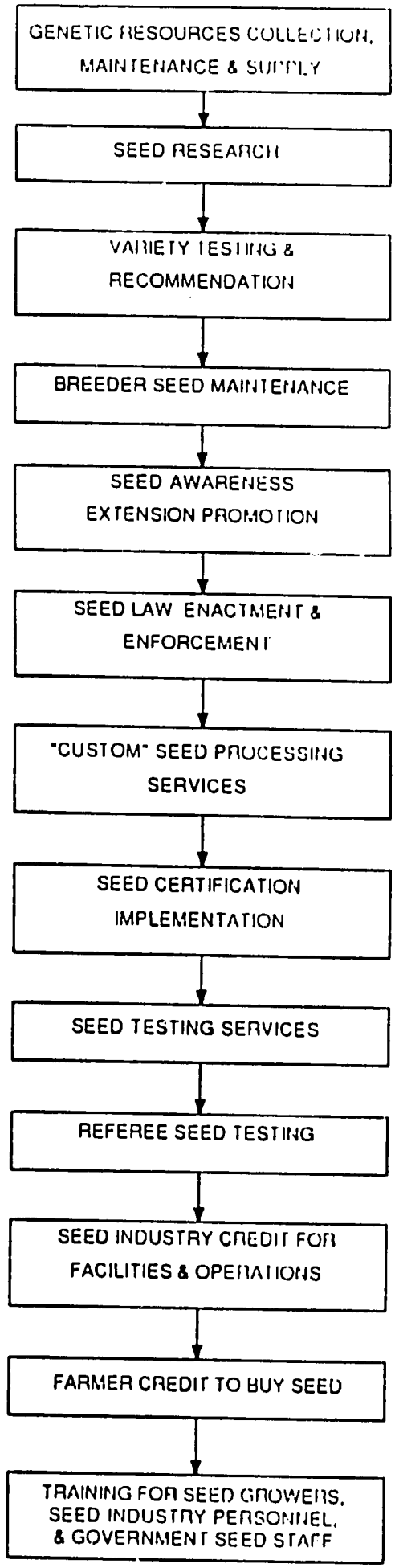
Training and technical upgrading of personnel will be given maximum emphasis. An Egypt Seed Technology Training Center should be developed to provide the manpower pool of professional seed technologists required to implement and manage technical operations. In-service short-term training courses will be held regularly to impart new technologies to staff, and upgrade their knowledge and performance of existing technologies.

Specific technical publications, manuals, and operating guides will be developed, translated into Arabic, and distributed to all personnel.

Training will follow the policy that personnel should not only have the in-depth technical training required to perform their own assigned tasks, but they should also be trained in the work of closely-related positions. "Cross-assignment" training is one of the best means of improving technical application and performance integration.

Efforts will be made to secure technical competence/training ratings of personnel as prerequisite to specific assignments; job descriptions will be upgraded; and all staff will participate in at least one training/technical updating each year.

All in-service training courses will have places reserved for both government and private sector personnel.




205

GOVERNMENT SUPPORT SERVICES REQUIRED TO MAINTAIN AN EFFECTIVE BI-SECTORIAL SEED SUPPLY

(10/87-9)

Especially after the training program has generated a pool of trained manpower at the working/operating/managing levels, the private sector will be permitted to draw freely from government manpower. Efforts will be made to work out procedures to permit transfer from government to the private sector without losing benefits of government personnel policies and procedures.

## SEED SUPPLY INFRASTRUCTURE

Infrastructure of the seed industry will be critically analyzed as to presence of required components and their performance in terms of the country's needs. Encouragement will be given to private-sector participation where this is in the best interests of agriculture and the overall seed industry. Government service and support infrastructure will be maximized, in terms of services provided and operating efficiency.

Government policy will be structured to reflect the need for seed industry components, coordination with other components, bi-sectorial participation, and operating support.

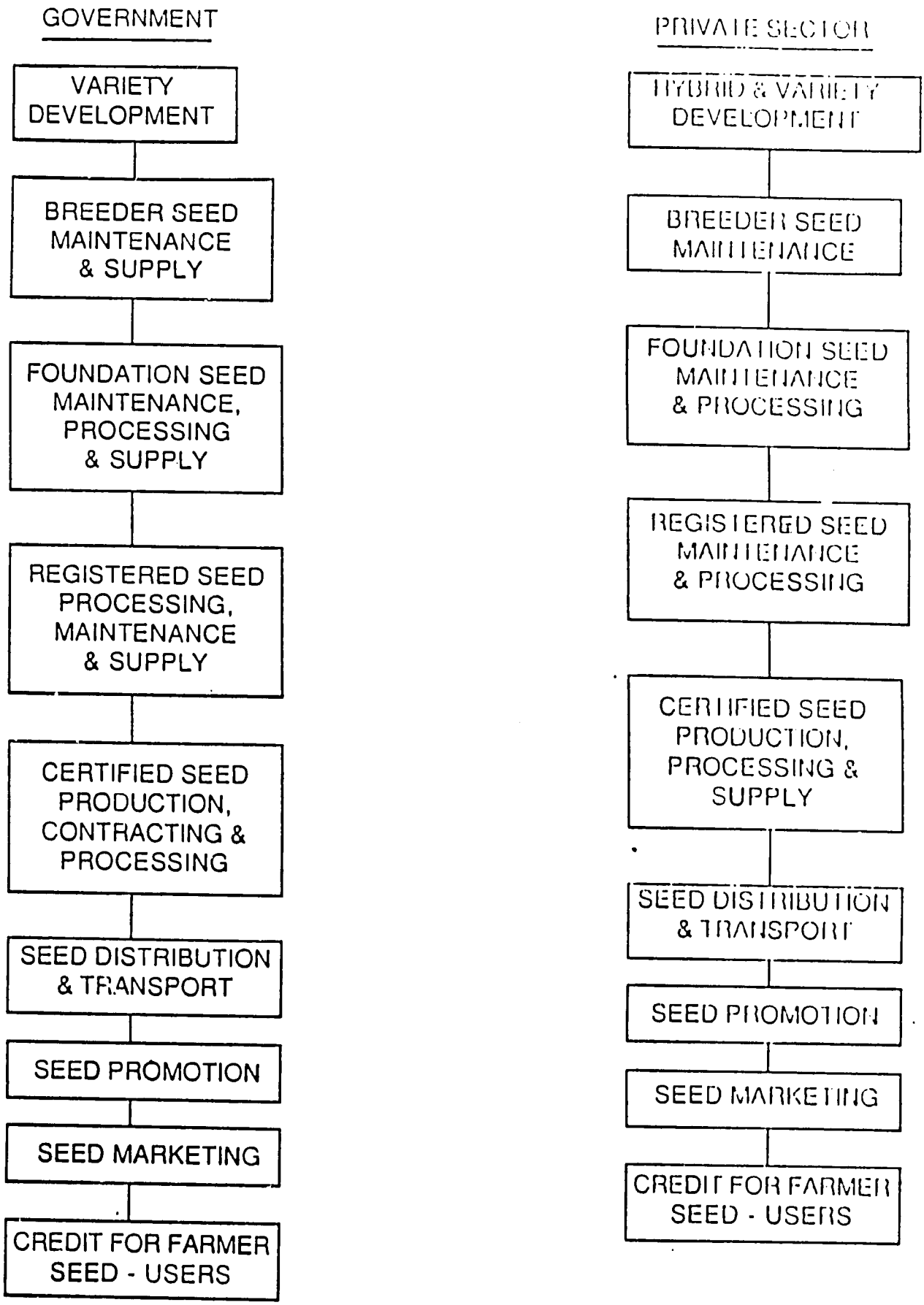
## SEED SUPPLY TO FARMERS

The sole purposes of the seed industry are (1) to provide all farmers with a higher-yielding seed input so as to maximize their production per feddan, and (2) to perform the required services efficiently, cost-economically, and quality-oriented.

As technological, organizational and managerial effectiveness of seed industry components are improved, seed quality and seed supply to farmers should improve measurably. More importantly, farm productivity should improve and increase farm family incomes, reduce land area required to produce required food supplies, increase national production, reduce dependence on imported food, and add to agriculture's ability to shift lands to other needed crops.

<u>QUANTITY:</u> Emphasis will be shifted to seed quality and ability to increase yields. However, the quantity of improved seed supplied to farmers will increase, and improved seed supplied through different channels (e.g., government input distribution system, local dealers, etc.) will be increased.

<u>QUALITY:</u> Primary emphasis will be placed on improved seed quality--germination to improve stands, vigor to improve field performance, genetic/varietal purity to increase yields, and physical purity to reduce planting requirements. Seed quality is a direct reflection of the technological development of seed industry components; as this program influences the status and operation of seed industry components, seed quality will increase.




SEED SUPPLY OPERATIONS WHICH CAN BE CARRIED OUT COOPERATIVELY AND NON-COMPETITIVELY BY GOVERNMENT AND THE PRIVATE SECTOR. GOVERNMENT USUALLY SUPPLIES SEED OF CROPS & VARIETIES NOT SUPPLIED BY THE PRIVATE SECTOR

(10/87-6)

# IX

## NARP'S IMPROVEMENTS IN TECHNOLOGY TRANSFER THROUGH SEED

Seed supply improvement to support ARC and its NARP-assisted program has been neglected, technically and financially, for so long that major upgrading is required. To accomplish this so improved technologies can be brought into use effectively will require a long time frame, divided into 3 phases for management control and to ensure realistic implementation according to existing developed capability. Development assistance included in NARP covers only a 4-year period--Phase I, as shown in this schedule.

### TRAINING

SEED PRODUCTION: Seed production is lacking in application of cost-efficient technology which can uniformly improve and maintain seed quality. To establish a base of technically-trained persons who can guide the development, implementation, training and improvement of production technology, 20 persons will receive M.S. training in Seed Production Technology. 1 person will receive Ph.D. training, to provide technical support to the overall national program.

SEED TESTING: Testing labs are ill-equipped and operations are not orderly, efficient or effectively organized. It is difficult to maintain testing results within tolerances, which makes repeatability difficult if not impossible; without accurate effective testing, it is not possible to operate effective Certification (as is included in NARP's scope of work) or Seed Law enforcement. The testing labs must undergo major revamping, which requires in-depth training. Training at the Master's-Degree level is required for 20 persons working in existing labs, to guide setting up new labs needed by the time training is completed, and working at the central office level in test standardization, analyst training, referee testing, and technical development. 1 person will receive Ph.D. training, to provide technical development support and guide referee testing and analyst training in the overall seed testing and seed law implementation program.

PROCESSING: Operation and management of processing/storage plants is a major area where seed costs and losses occur. Proper training for managers and leaders at these plants is essential.

M.S. training in seed technology, the shortest training which can provide the required technical competence, is needed for 8 persons for the 8 processing/storage/handling plants and in the central office to support/guide overall processing operations, planning, in-plant quality development, and

maintenance. At least one--preferably two--trained person at each plant is needed to manage processing/handling operations and supervise seed harvest, quality control, in-plant storage, distribution, stocks management, and delivery. At the main office, the newly-trained persons will supervise and plan support operations, plan and conduct training, maintain equipment condition/replacement/spare parts, and coordinate operations. They will also implement short training courses and provide a pool of trained manpower on which the private sector can draw.

SEED CERTIFICATION: Certification cannot ensure adequate seed quality or gain and hold farmer confidence without adequate applied technology under local conditions; its major need is adequate personnel with knowledge of and ability to apply technology. To fill this need, key Certification officers will be trained at the M.S. level in seed technology with emphasis on quality control.

12 persons will be trained at the M.S. level; upon return, they will supervise local CAS offices, train/guide staff and operations in seed Certification, improve operations such as seed storage and distribution, and handle technical aspects implemented/supervised by the central office. 1 person will receive Ph.D. training; this person will be expected to guide development and application of improved technology to the overall Certification program.

SEED RESEARCH/TRAINING: There is serious need for adaptive problem-solving research to resolve specific problems encountered in supplying seed under local conditions. Presently, 1 Seed Research Section staff member is trained in seed science and technology.

A future requirement which must ultimately be satisfied--or led--by ARC is the growing need for persons highly-trained in seed technology, especially as hybrids and modern technology is implemented. Over the next 2 decades, Egypt will require a large number of trained persons in both private and government seed programs. It is most cost-efficient to establish within the ARC (in collaboration with a suitable university) a laboratory/program to provide B.S., M.S., Ph.D., and short-term training in seed science and technology.

Training can then be provided by an Egypt Seed Technology Training Center. This will require Ph.D.-level training of specialized seed professionals to conduct classes and research, and guide students.

3 ARC staff members will receive Ph.D. training in Seed Technology. They are expected to staff the ARC Seed Research Section so it can function as a problem-solving adaptive research and technical support unit, and can cooperate with universities to provide in-depth adequate in-country B.S., M.S. and Ph.D. training in Seed Technology.

GENETIC RESOURCES: While the Genetic Resources Section has a competent basic staff, more staff is needed and present staff need to upgrade their training and experience in both seed technology and genetic resource collection and management.

Two persons will be sent for the 3-month intensive USDA TC 130-3 seed technology training course.

SHORT-TERM IN-EGYPT TRAINING: Short-term specialists will be secured to conduct short specialized training courses in specific areas of seed technology. These courses will transfer improved technology to operating staff of the seed program. Included will be 1 course on seed testing, 1 on seed processing, 1 on seed certification, and 1 on seed production and physiology. Each course will include 40 persons from selected operations within the seed program.

SHORT-TERM OVERSEAS TRAINING: To give seed program staff an opportunity to see current overseas developments in seed operations, management, and private sector integration, 15 seed staff will be sent to the USDA TC 130-3 Seed Technology Training Course. These persons will be selected from seed production, processing, certification, variety development, and testing operations.

Two persons from the Genetic Resources Section will participate in the TC 130-3 training course. This is the most cost-efficient means of transferring adequate seed technology to the Genetic Resources operations.

TRAINING PLAN: Trainees will be selected, trained/tested in English language capability, and sent for training on a priority basis to complete training and return to the program as soon as possible. The primary anticipated limitation is the number of trainees the university can absorb in each academic year. The training plan is shown in Table 38. This training plan is a minimal, initial training effort; for example, the Thailand seed program has one Seed Technology M.S. for each 30 staff (officers and workers); this training plan will develop one M.S. for each 150 staff.

TABLE 38
TRAINING PLAN

| AREA | NO. OF TRAINEES & TYPE OF TRAINING | | | | |
|---|---|---|---|---|---|
| | M.S. | Ph.D. | POST-DOCTORAL | LOCAL SHORT | TC 130-3 & INTERN |
| Seed Testing | 20 | 1 | 0 | 40 | 5 |
| Seed Conditioning | 8 | 0 | 0 | 40 | 5 |
| Seed Certification | 12 | 1 | 0 | 40 | 2 |
| Seed Production | 20 | 1 | 0 | 40 | 3 |
| Seed Research/training | 0 | 3 | 0 | 6 | 0 |
| Genetic Resources | 0 | 0 | 0 | 8 | 2 |
| TOTALS | 60 | 6 | 0 | 174 | 17 |

**COMMODITIES**

Efficient and adequate equipment is urgently needed for:

1. Completing the seed research facilities established under EMCIP.

2. Upgrading/re-equipping 3 existing seed testing labs and equipping 3 labs established in new sites by transferring some staff and operations.

3. Establishing in-plant QC facilities at EMCIP and upgraded plants.

4. Providing spare parts and equipment to balance operations at EMCIP plants.

5. Upgrading 8 existing plants to improve farmer acceptance of improved seed, improving support to the private sector, and balancing seed supply by providing improved amounts/kinds of Foundation/ Registered/Certified seed not supplied by the private sector.

6. Upgrading the management data and control system, to provide closer coordination among seed industry components and improve timeliness and quality of support to farmers and the private sector.

7. Equipping the ARC FCRI Genetic Resources Section so it can function effectively.

8. Renew the existing cotton research and seed facility.

These will improve NARP's effectiveness and support private-sector development by improving (1) services provided by government; (2) timeliness and efficiency of support; (3) farmer acceptance of higher-cost and higher-quality seed, and (4) balance seed supply operations.

COMPLETING RESEARCH/TRAINING FACILITIES: EMCIP recognized the importance of organized, coordinated seed research to support crop research and improved seed supply to transfer new technology to farmers. Due to time and budgetary constraints, the EMCIP-established ARC FCRI Seed Research Section was not fully equipped. Equipment will be provided to enable it to conduct the required research and to provide in-country training in collaboration with university faculties of agriculture.

UPGRADING SEED TESTING: Seed testing services which are uniform and follow standardized procedures to ensure reliable repeatable results, are essential to achieve higher-quality seed which can increase crop yields and permit NARP to influence national agricultural production. They are also essential to support private sector development. The existing 3 old, outdated, poorly-equipped labs (Giza, Tanta, and Minia) will be upgraded and re-equipped, and some operations will be transferred to new sites, to set up 3 urgently-needed labs at new locations (Assiut, Mansoura, and Zagazig).

IN-PLANT QUALITY CONTROL: EMCIP plants were not completed in time to establish the in-plant quality-control system needed for efficient operation and uniformly high seed quality. Equipment will be provided to establish in-plant QC operations for EMCIP plants and plants which are upgraded.

SUPPORTING EMCIP PLANTS: Initial operations of the EMCIP plants, as is normal for new plants, indicate the need for additional equipment, machine components and spare parts to operate effectively and prevent delays. The required spare parts, additional specific machines, and machine components such as screens will be provided.

UPGRADING SOME OF THE EXISTING PLANTS: To provide the required seed and support NARP effectively, improved seed facilities are urgently needed; Winrock/USAID identified 9 existing plants which should be replaced. These plants are used only for crop seed which are not of commercial interest to the private sector. Equipment required to upgrade and standardize only 8 existing plants will be provided. Although this number of plants is still inadequate for existing needs, it will improve supply of Foundation,

Registered and Certified seed, and will improve support and processing services for the private sector.

MANAGEMENT DATA SYSTEM: Major improvements in timely service to farmers, operating costs, quality losses, and operating efficiency can be achieved through an efficient data and management information control system. Without this, the seed program cannot be effectively integrated. Computer equipment required for the basic data control and management information system will be provided.

GENETIC RESOURCES: The Genetic Resources Section has been established, but does not have equipment adequate to permit it to operate. The required minimal equipment will be provided.

RESEARCH/SEED COTTON FACILITY: One 85-year-old facility provides all basic cotton planting seed; this facility is badly worn and unable to provide seed at reasonable time and cost, and prevent mechanical contamination without loss of seed.

**REFURBISHING EXISTING STRUCTURES**

Only a relatively small part of existing operations will be upgraded and updated, rather than establish new programs. This will require improvement and refurbishing of existing buildings, which are inadequate to permit cost- and time-effective operations and work flow. Improved equipment will not fit into present rooms; present rooms are not in the required arrangements; floors/walls have been damaged by long-term usage without funds for repair; seed storage yards and buildings have been damaged or need technical modification, etc. Refurbishing/rehabilitation of existing facilities is required prior to installation and operation of the upgraded facilities so they can provide the intended services.

Refurbishing will be required for all assisted facilities; GOE funds will be provided for all required refurbishing except the following whose refurbishing will require some imported items:

1. The Genetic Resources Section, to permit operating the Germ Plasm Bank to conserve/supply genetic materials to support variety breeding research.

2. The research/seed cotton facility.

**TECHNICAL ASSISTANCE**

Technical assistance will be provided through the CID/NARP contract.

**BUDGET**

| | | | |
|---|---|---|---|
| RESEARCH | | | $13,882,000 |
| Commodities: | | $9,600,000 | |
| Genetic Resources Lab | $500,000 | | |
| Seed Research/Training | 1,300,000 | | |
| Cotton | 7,800,000 | | |
| Training: | | $182,000 | |
| 2 TC 130-3 | 22,000 | | |
| 4 Ph.D. | 160,000 | | |
| Refurbishing Exis'ing Structures: | | $4,100,000 | |
| Genetic Resources Lab | 100,000 | | |
| Cotton | 4,000,000 | | |
| INFRASTRUCTURAL SUPPORT FOR RESEARCH & PRIVATE SECTOR | | | $17,825,000 |
| Commodities: | | $15,480,000 | |
| 8 renewed plants | $9,580,000 | | |
| Data management | 800,000 | | |
| EMCIP plants | 1,000,000 | | |
| 12 in-plant QC units | 1,900,000 | | |
| 6 seed labs @ $333,400 | 2,200,000 | | |
| Training: | | $2,345,000 | |
| 15 TC 130-3 | 165,000 | | |
| 2 Ph.D. | 80,000 | | |
| 60 M.S. | 2,100,000 | | |
| TECHNICAL ASSISTANCE: | | | $1,227,000 |
| Long-term | 1,122,00 | | |
| Short-term | 105,000 | | |
| CONTINGENCIES: | | | $1,642,000 |
| INFLATION: | | | $5,424,000 |

TOTAL BUDGET:

| | |
|---|---|
| Commodities | US$25,080,000 |
| Training | 2,527,000 |
| Refurbishing facilities | 4,100,00 |
| Technical assistance | 1,227,000 |
| Contingencies | 1,642,000 |
| Inflation | 5,424,000 |
| TOTAL | US$40,000,000 |

**GOE SUPPORT**

Locally-funded support provided by GOE will include:

1. Funds for seed operations.

2. Funds for construction required for EMCIP plants, in-plant quality control units, renovated conditioning plants, and seed testing laboratories.

3. Personnel and personnel costs.

4. Costs of utilities and operations of facilities.

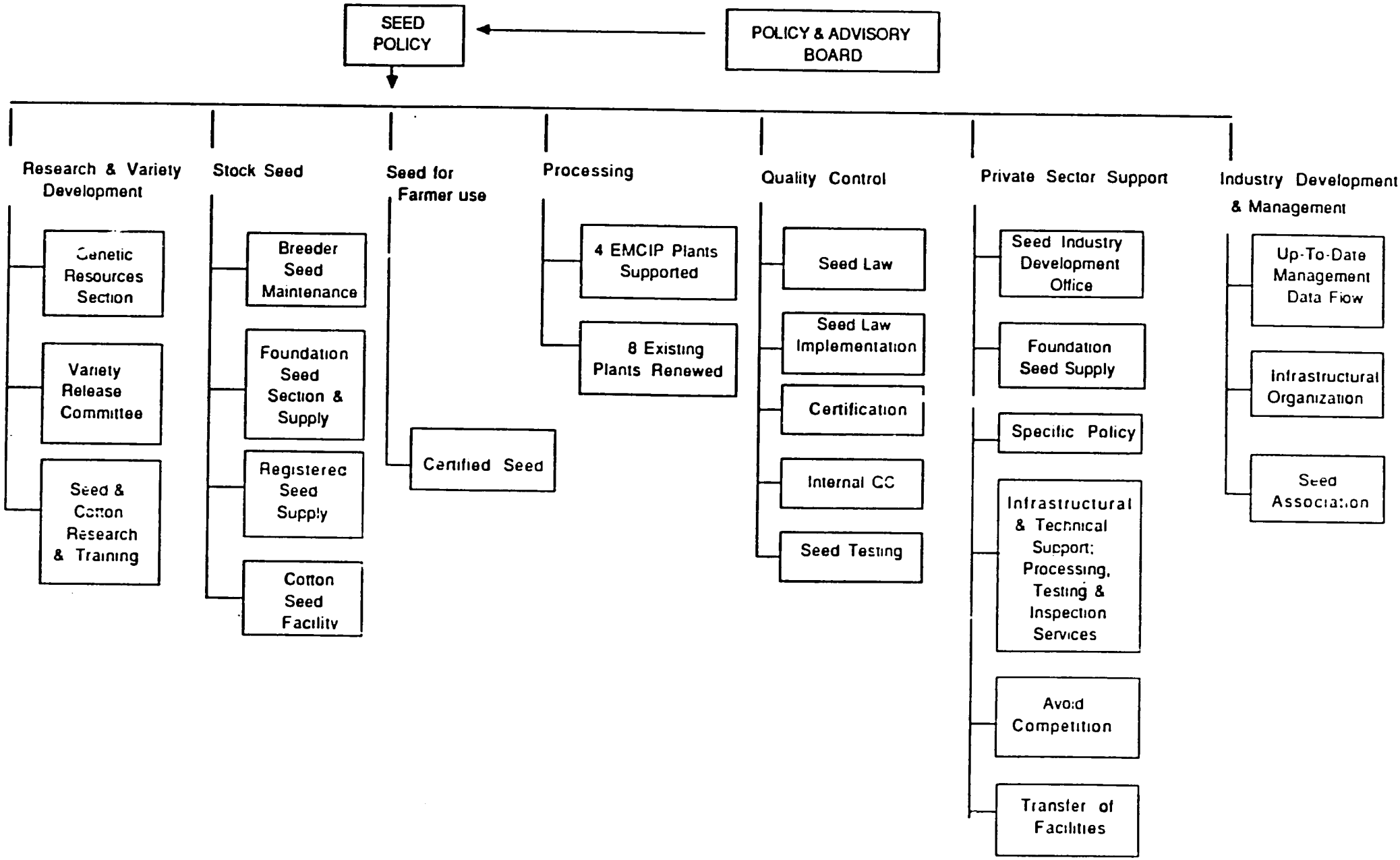
5. Seed development, maintenance, contracting, and procurement costs.

6. Land, sites, access, etc.

7. Electrical, plumbing, etc., costs.

NARP SEED COMPONENT

MINIMAL IMPROVEMENT OF EXISTING INFRASTRUCTURE




216.

# X

# IMPLEMENTATION PLAN

## NARP SEED IMPROVEMENT

NARP will upgrade part of the existing facilities, train a basic number of staff, work toward expanded private-sector participation, and initiate improvements at policy and infrastructural levels. This could be considered as "Phase I" of the required long-term improvement in the seed delivery infrastructure.

TIME FRAME: 4 years.

ACTIVITIES:

Activities will include:

1. Upgrade 8 existing processing plants.

2. Improve EMCIP processing plant operations and quality control.

3. Improve management and operating systems.

4. Improve seed testing.

5. Initiate need-oriented seed research and in-country training, and renew the existing cotton research/seed facility.

6. Improve Foundation seed supply and maintenance.

7. Provide urgently-needed training for a basic number of operating staff.

8. Establish in CAS a Seed Industry Development Section, and actively promote private-sector investment.

9. Improve organization, structure and equipment of the CAS Statistics & Training Department, to give it the capabilities of a Data Management Section.

11. Initiate improvements in seed policy, seed policy advisory groups, and implementation of the Seed Law and Seed Certification.

12. Procure equipment needed for the ARC Genetic Resources Section, arrange needed refurbishing of facilities, train staff, integrate and expand operations, etc.

SCHEDULE:

Implementation will require approximately the following schedule:

YEAR 1: survey and evaluate seed infrastructural components; identify needed new, and improvements for existing components; identify equipment needs and initiate procurement; identify trainees to receive training, provide training in English language, and send the first group for training; identify, plan and design improvements in storage structures; initiate establishment of a CAS office to encourage and promote seed industry development; begin plans for improving seed testing labs; improve existing operations; initiate improvements in seed policy and infrastructural organization.

YEAR 2: begin receiving ordered equipment, and inspect and install it; send more trainees for special training; initiate refurbishing of storage, testing, processing, and in-plant QC facilities; continue improvements in facilities to be refurbished; continue English language training and selection of trainees; improve operations of existing program components; work toward improvements in organization, policy, legal aspects, and implementation; promote private-sector participation.

YEAR 3: continue receiving ordered equipment, and inspect and install it; conduct "shake-down" operations; initiate improved work flow and operations in seed testing labs; implement improvements in storage and processing facilities; continue selecting and training staff; conduct short-term in-country training; initiate improvements in operations; set up improved procedures and systems; upgrade and implement improved policies; promote private-sector participation; integrate returned trainees into the program so they can have an impact on technology/operations/management; strengthen the CAS data management system.

YEAR 4: install final equipment and bring it into use; train operating personnel; begin improved data management system; conduct in-depth survey of seed industry to identify effectiveness and needs of various components; prepare implementation document for Phase II; train staff of the seed data management system.

IMPLEMENTING AGENCIES:

Implemented by the Ministry of Agriculture and Land Reclamation through CAS, ARC, other government seed agencies, and the private sector.

# XI

# COMPLETING ESSENTIAL DEVELOPMENT OF SEED SUPPLY

## PHASING IMPROVEMENTS

Bringing a seed supply industry into efficient balance is a long and complex process. Anything which affects agriculture affects the seed industry; attitudes must be changed, legal aspects implemented, policies established, personnel selected and trained, equipment procured/installed/brought into operation. Each takes time, and all must be integrated into time-sensitive operations to establish a responsive seed supply system.

In no country can this be effectively accomplished in a short time span, and Egypt is no different. For example, external technical and financial assistance was required in India for more than 20 years; in Brazil for 12 years; and is still continuing in Thailand after more than 10 years.

To proceed realistically so improvements can be integrated into the operating system and used effectively, the development of a stable integrated seed system to transfer NARP's research technology to farmers should be implemented in at least three 4-year phases. During each phase, improvements which can be integrated into the operating system will be implemented, and realistic detailed plans made for the next phase. The phased approach effectively prevents waste of resources and permits useful integration of improvements into the operating system without excessive delay or "technical culture shock".

## PHASE II--AFTER NARP

Following NARP, a "second phase" should continue and build upon the developments initiated by NARP. This should include the following, although exact details and schedules will depend on the progress mader under NARP.

TIME FRAME: 4 Years

ACTIVITIES:

Activities during Phase II will include:

1. Critically evaluate remaining needs for seed processing/storage: evaluate condition and needs of existing processing/storage plants and needs for additional facilities, in view of changes made in Phase I.

2. Improve management and operation of processing plants.

3. Upgrade storage structures and storage and distribution management and operations.

4. Procure equipment and construct buildings for which realistic needs were identified for processing and storage; install equipment and bring it into use.

5. Bring seed testing up-to-date; establish regular referee testing and analyst upgrading.

6. Implement seed research oriented toward industry development and problem-solving.

7. Improve Breeder seed operations, supply and long-term maintenance.

8. Improve Foundation seed supply operations, management, organization, and facilities/systems for medium-term seed maintenance to improve supply and reduce costs.

9. Provide training for operating staff, both long-term and short-term, abroad and in-country.

10. Initiate implementation of an Egypt Seed Technology Training Center in ARC in collaboration with an appropriate university(ies); procure and install equipment, plan and develop course offerings, begin development of course syllabi and training materials, support and improve operations.

11. Evaluate current status of seed supply infrastructure, and plan and initiate infrastructural improvements.

12. Plan structural organization of production, processing, storage, etc., so maximum use of facilities is obtained and farmer supply of high-quality seed is increased.

13. Continue and improve operations of the CAS Seed Industry Development office, and actively promote private-sector investment.

14. Analyze ARC Variety Release and Breeder seed operations; establish policies to improve performance and reduce costs; identify equipment/facility/staff/organizational needs and provide improvements needed; arrange systems for long-term storage of seed for security seed supplies.

15. Improve data management to support the decision-making process.

16. Accelerate need-oriented seed research, and publish internationally

SCHEDULE:

To permit effective implementation, a detailed schedule will be prepared in the last year of Phase I, so as to be currently realistic and reflect accomplishments achieved, problems encountered, and needs identified. However, procurements and training will be initiated as early possible, as other activities generally depend on completion of these.

IMPLEMENTING AGENCIES:

Phase II will be implemented by the Ministry of Agriculture and Land Reclamation's CAS, ARC, and other seed agencies and the private sector.

**Phase III**

TIME FRAME: 4 Years

ACTIVITIES:

Activities during Phase III will be aimed at consolidating gains made in previous Phases, providing identified improvements and needs, improving management and operations, improving technical application and development, and improving farmer supply/use of seed. By this time, the private sector should be a major component. Activities will include:

1. Upgrade and integrate government processing, storage and distribution facilities and equipment; upgrade layouts and operations.

2. Initiate a spare parts procurement and orderly equipment replacement/ management system to serve all processing plants.

3. Identify and supply needs for additional facilities, especially in locations in Governorates which have not previously been able to participate effectively in seed production.

4. Improve processing, storage and distribution management and operating systems.

5. Improve seed testing services, organization, operations, and reporting. Critically evaluate current needs in view of seed industry growth and anticipated needs, and establish new labs as required.

6. Organize support for, and a means of identifying, need-oriented seed research. Continue and expand seed-related research; publish locally and internationally.

7. Improve Breeder seed operations, facilities, supply and long-term maintenance.

8. Improve Foundation seed supply and medium-term storage to ensure timely delivery, adequate supply and maintenance of the required varieties.

9. Provide overseas and in-country training for operating staff

10. Continue preparation of training materials for, and initiate operation of, the Egypt Seed Technology Training Center; support and improve its operations.

11. Promote and support private-sector participation through technical cooperation, implementation of a Seed Trade Association, operation of support activities, and bi-sectorial participation in training, meetings, publications, etc.

12. Establish and implement an extension-type "Seed Awareness system to promote farmer understanding and use of improved seed, and to assist other agencies in their promotion work.

13. Improve facilities and operations at village-level distribution sites.

14. Improve data management to support the decision-making process.

15. Upgrade seed testing and introduce more specific test procedures.

SCHEDULE:

To permit effective implementation, a detailed schedule will be prepared in the last year of Phase II, in view of accomplishments achieved, problems encountered, and needs identified during its implementation so as to be currently realistic.

Procurements and training will be initiated as early as possible, because other activities generally depend on completion of these.

IMPLEMENTING AGENCIES:

Phase III will be implemented by the Ministry of Agriculture and Land Reclamation through CAS, ARC, and other government seed agencies, and the private sector.

**NATIONAL AGRICULTURAL RESEARCH PROJECT**
(263-0152)
AMENDMENT NO. 2

SEED TECHNOLOGY COMPONENT
COST ESTIMATE
($000)

PROJECTION OF EXPENDITURES BY FISCAL YEARS

| | ACTUAL THRU FY88 | | FY89 | | FY90 | | FY91 | | FY92 | | FY93 | | FY94 | | TOTAL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | TOTAL |
| **TECHNICAL ASSISTANCE** | 238 | 51 | 198 | 36 | 213 | 36 | 198 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 1,351 | 267 | 1,618 |
| LONG TERM | 238 | 51 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 1,246 | 267 | 1,513 |
| SHORT TERM | 0 | 0 | 30 | 0 | 45 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 105 | 0 | 105 |
| **TRAINING** | 0 | 0 | 0 | 0 | 1,124 | 0 | 1,154 | 0 | 183 | 0 | 33 | 0 | 33 | 0 | 2,527 | 0 | 2,527 |
| LONG TERM | 0 | 0 | 0 | 0 | 1,080 | 0 | 1,110 | 0 | 150 | 0 | 0 | 0 | 0 | 0 | 2,340 | 0 | 2,340 |
| SHORT TERM | 0 | 0 | 0 | 0 | 44 | 0 | 44 | 0 | 33 | 0 | 33 | 0 | 33 | 0 | 187 | 0 | 187 |
| **COMMODITIES** | 0 | 0 | 675 | 0 | 14,565 | 0 | 8,360 | 0 | 3,480 | 0 | 0 | 0 | 0 | 0 | 27,080 | 0 | 27,080 |
| RESEARCH SECTION | 0 | 0 | 200 | 0 | 1,100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,300 | 0 | 1,300 |
| GENETIC RESOURCES LABORATORY | 0 | 0 | 75 | 0 | 425 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 500 | 0 | 500 |
| COTTON RESEARCH/SEED LAB | 0 | 0 | 300 | 0 | 4,200 | 0 | 3,300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7,800 | 0 | 7,800 |
| IN-PLANT QUALITY CONTROL | 0 | 0 | 0 | 0 | 1,400 | 0 | 500 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,900 | 0 | 1,900 |
| SEED CONDITIONING | 0 | 0 | 0 | 0 | 3,950 | 0 | 4,150 | 0 | 3,480 | 0 | 0 | 0 | 0 | 0 | 11,580 | 0 | 11,580 |
| EMCIP PLANTS | 0 | 0 | 0 | 0 | 1,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,000 | 0 | 1,000 |
| TESTING LABORATORIES | 0 | 0 | 100 | 0 | 2,100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2,200 | 0 | 2,200 |
| DATA MANAGEMENT | 0 | 0 | 0 | 0 | 390 | 0 | 410 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 800 | 0 | 800 |
| **SERVICES** | 0 | 0 | 500 | 100 | 0 | 2,000 | 0 | 0 | 1,500 | 0 | 0 | 0 | 0 | 0 | 2,000 | 2,100 | 4,100 |
| MAINTENANCE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| RENOVATION | 0 | 0 | 500 | 100 | 0 | 2,000 | 0 | 0 | 1,500 | 0 | 0 | 0 | 0 | 0 | 2,000 | 2,100 | 4,100 |
| **SUB-TOTAL** | 238 | 51 | 1,373 | 136 | 15,902 | 2,036 | 9,712 | 36 | 5,331 | 36 | 201 | 36 | 201 | 36 | 32,958 | 2,367 | 35,325 |
| CONTINGENCIES 5% | 0 | 0 | 69 | 7 | 795 | 102 | 486 | 2 | 267 | 2 | 10 | 2 | 10 | 2 | 1,636 | 116 | 1,752 |
| INFLATION | 0 | 0 | 69 | 15 | 1,630 | 357 | 1,531 | 8 | 1,149 | 10 | 56 | 14 | 68 | 18 | 4,502 | 421 | 4,924 |
| **TOTAL** | 238 | 51 | 1,510 | 158 | 18,327 | 2,495 | 11,728 | 45 | 6,746 | 48 | 267 | 51 | 279 | 56 | 39,096 | 2,904 | 42,000 |

7/31/88 2:56 PM

22

**NATIONAL AGRICULTURAL RESEARCH PROJECT**
(263-0152)
AMENDMENT NO. 2

SEED TECHNOLOGY COMPONENT
TECHNICAL ASSISTANCE COST ESTIMATE
($000)

PROJECTION OF EXPENDITURES BY FISCAL YEARS

| SPECIALIZATION | NO. OF M/M | COST PER MAN MONTH | | TOTAL | | ACTUAL THRU FY88 | | FY89 | | FY90 | | FY91 | | FY92 | | FY92 | | FY94 | | TOTAL | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | |
| **LONG TERM** | 89 | | | 1,246 | 267 | 238 | 51 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 1,246 | 267 | 1,513 |
| SEED SPECIALIST (CID) | 89 | 14.00 | 3.00 | 1,246 | 267 | 238 | 51 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 1,246 | 267 | 1,513 |
| **SHORT TERM** | 7 | | | 105 | 0 | 0 | 0 | 30 | 0 | 45 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 105 | 0 | 105 |
| SEED TECHNOLOGY (CID) | 7 | 15.00 | 0.00 | 105 | 0 | 0 | 0 | 30 | 0 | 45 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 105 | 0 | 105 |
| | | | | | | | | | | | | | | | | | | | | 0 | 0 | |
| **TOTAL** | 96 | | | 1,351 | 267 | 238 | 51 | 198 | 36 | 213 | 36 | 198 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 1,351 | 267 | 1,618 |

226

**NATIONAL AGRICULTURAL RESEARCH PROJECT**
(263-0152)
AMENDMENT NO. 2

SEED TECHNOLOGY COMPONENT
TRAINING COST ESTIMATE
($000)

PROJECTION OF EXPENDITURES BY FISCAL YEARS

| ILLUSTRATIVE TRAINING PROGRAM | NUMBER OF PARTICIPANTS | TRAINING MONTH(T.M) | COST PER UNIT | | TOTAL | | FY89 | | FY90 | | FY91 | | FY92 | | FY93 | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | |
| **LONG TERM TRAINING** | 66 | 936 | | | 2,340 | 0 | 1,080 | 0 | 1,110 | 0 | 150 | 0 | 0 | 0 | 0 | 0 | 2,340 |
| *MASTERS STUDIES* | | | | | | | | | | | | | | | | | |
| SEED QUALITY | 12 | 168 | 2.5 | 0.0 | 420 | 0 | 180 | 0 | 210 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 420 |
| SEED CONDITIONING | 8 | 112 | 2.5 | 0.0 | 280 | 0 | 120 | 0 | 140 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 280 |
| TESTING | 20 | 280 | 2.5 | 0.0 | 700 | 0 | 300 | 0 | 350 | 0 | 50 | 0 | 0 | 0 | 0 | 0 | 700 |
| PRODUCTION & CERTIFICATION | 20 | 280 | 2.5 | 0.0 | 700 | 0 | 300 | 0 | 350 | 0 | 50 | 0 | 0 | 0 | 0 | 0 | 700 |
| *DOCTORAL STUDIES* | | | | | | | | | | | | | | | | | |
| SEED RESEARCH | 2 | 32 | 2.5 | 0.0 | 80 | 0 | 60 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 80 |
| TRAINING | 2 | 32 | 2.5 | 0.0 | 80 | 0 | 60 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 80 |
| PRODUCTION & CERTIFICATION | 2 | 32 | 2.5 | 0.0 | 80 | 0 | 60 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 80 |
| *POST DOCTORAL* | | | | | | | | | | | | | | | | | |
| SEED RESEARCH | 0 | 0 | 2.5 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| GENETIC RESOURCES LABORATORY | 0 | 0 | 2.5 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **SHORT TERM TRAINING** | 17 | 22 | | | 187 | 0 | 44 | 0 | 44 | 0 | 33 | 0 | 33 | 0 | 33 | 0 | 187 |
| **OUT-OF-COUNTRY** | | | | | | | | | | | | | | | | | |
| *SHORT COURSES-TRAINING 130-3* | | | | | | | | | | | | | | | | | |
| GENETIC RESOURCES LABORATORY | 2 | 2 | 11.0 | 0.0 | 22 | 0 | 11 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 |
| SEED CONDITIONING | 5 | 5 | 11.0 | 0.0 | 55 | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 55 |
| TESTING LABORATORIES | 5 | 5 | 11.0 | 0.0 | 55 | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 55 |
| PRODUCTION & CERTIFICATION | 5 | 10 | 11.0 | 0.0 | 55 | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 55 |
| *SHORT TERM* | | | | | | | | | | | | | | | | | |
| SEED CONDITIONING | 0 | 0 | 5.0 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TESTING LABORATORIES | 0 | 0 | 5.0 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PRODUCTION & CERTIFICATION | 0 | 0 | 5.0 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **TOTAL** | 83 | 958 | | | 2,527 | 0 | 1,124 | 0 | 1,154 | 0 | 183 | 0 | 33 | 0 | 33 | 0 | 2,527 |

NATIONAL AGRICULTURAL RESEARCH PROJECT
(263-0152)
AMENDMENT NO. 2

SEED TECHNOLOGY COMPONENT
COMMODITIES COST ESTIMATE
($000)

PROJECTION OF EXPENDITURES BY FISCAL YEARS

| COMMODITY AREAS | FY89 | | FY90 | | FY91 | | FY92 | | FY93 | | FY94 | | TOTAL | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | |
| RESEARCH SECTION | 200 | 0 | 1,100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,300 | 0 | 1,300 |
| GENETIC RESOURCES LABORATORY | 75 | 0 | 425 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 500 | 0 | 500 |
| COTTON RESEARCH/SEED LAB | 300 | 0 | 4,200 | 0 | 3,300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7,800 | 0 | 7,800 |
| IN-PLANT QUALITY CONTROL | 0 | 0 | 1,400 | 0 | 500 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,900 | 0 | 1,900 |
| SEED CONDITIONING | 0 | 0 | 3,950 | 0 | 4,150 | 0 | 3,480 | 0 | 0 | 0 | 0 | 0 | 11,580 | 0 | 11,580 |
| EMCIP PLANTS | 0 | 0 | 1,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,000 | 0 | 1,000 |
| TESTING LABORATORIES | 100 | 0 | 2,100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2,200 | 0 | 2,200 |
| DATA MANAGEMENT | 0 | 0 | 390 | 0 | 410 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 800 | 0 | 800 |
| TOTAL | 675 | 0 | 14,565 | 0 | 8,360 | 0 | 3,480 | 0 | 0 | 0 | 0 | 0 | 27,080 | 0 | 27,080 |

**NATIONAL AGRICULTURAL RESEARCH PROJECT**
(263-0152)
AMENDMENT NO. 2

SEED TECHNOLOGY COMPONENT
SERVICES COST ESTIMATE
($000)

PROJECTION OF EXPENDITURES BY FISCAL YEARS

| ITEMS | FY89 | | FY90 | | FY91 | | FY92 | | FY93 | | TOTAL | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | |
| **MAINTENANCE** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| GENETIC RESOURCES LAB | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| COTTON RESEARCH/SEED LAB | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **RENOVATION** | 500 | 100 | 2,000 | 0 | 1,500 | 0 | 0 | 0 | 0 | 0 | 4,000 | 100 | 4,100 |
| RESEARCH SECTION | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| GENETIC RESOURCES LAB | 0 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 100 | 100 |
| COTTON RESEARCH/SEED LAB | 500 | | 2,000 | | 1,500 | | 0 | 0 | 0 | 0 | 4,000 | 0 | 4,000 |
| IN-PLANT QUALITY CONTROL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SEED CONDITIONING | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TESTING LABORATORIES | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **TOTAL** | 500 | 100 | 2,000 | 0 | 1,500 | 0 | 0 | 0 | 0 | 0 | 4,000 | 100 | 4,100 |

7/31/88 2:47 PM

229

AGENCY FOR INTERNATIONAL DEVELOPMENT

Washington, D. C. 20523

PROJECT PAPER
AMENDMENT #2
ANNEX N

EGYPT: National Agricultural
Research (263-0152)

August 22, 1988



720

## RESEARCH COMPONENT ANNEXES

N.1. Master Training Plan
N.2. Maintenance Program Plans
N.3. Land and Communications Improvements
N.4. Renovation Plan
N.5. Research Support Program
N.6. Research Grants Manual
N.7. International Collaborative Research
N.8. Technical Assistance Contracts
N.9. Detailed Budget Tables

# NATIONAL AGRICULTURAL RESEARCH PROJECT

# NARP

MINISTRY OF AGRICULTURE
AND LAND RECLAMATION (MOA)
The Arab Republic of Egypt (A.R.E.), Cairo

UNITED STATES AGENCY FOR
INTERNATIONAL DEVELOPMENT (USAID)
U.S. Embassy, Cairo, A.R.E.

CONSORTIUM FOR
INTERNATIONAL DEVELOPMENT (C.I.D.)
Tucson, Arizona

## MANPOWER DEVELOPMENT AND TRAINING PLAN

by

Dr. A. Sahrigi, et. al.

NARP Publication No. 8

USAID PROJECT 263-0152
Published November 1987

232

# TABLE OF CONTENTS


| | | Page |
|---|---|---|
| | SUMMARY | 1 |
| I. | BACKGROUND | 3 |
| | A. NARP | 3 |
| | B. Agriculture and Technology in Egypt | 4 |
| | C. NARP Manpower Development and Training | 4 |
| II. | NARP MANPOWER DEVELOPMENT AND TRAINING OBJECTIVE | 5 |
| III. | MANPOWER DEVELOPMENT AND TRAINING PROCESS | 6 |
| | A. Projected Agriculture Research Strategies and Needs | 7 |
| | B. Training Needs | 11 |
| | Agricultural Research Center Personnel Inventory | 11 |
| | Perceived Training Needs by ARC Research Unit Directors | 13 |
| | Perceived Training Needs by Research Studies Program | 14 |
| | Future Needs Evaluation | 14 |
| | C. Manpower Development and Training Plans | 15 |
| | Description of Components | 17 |
| | Planned Training Activities | 21 |
| | Academic Training Plans-PhD Degrees | 25 |
| | Postdoctoral Training Plans | 32 |
| | D Training Implementation | 36 |
| | E. Training Evaluation | 36 |
| IV. | APPENDICES | |
| | A. Summary of Assessment Report of the Agricultural Research Environment: The Case of Egyptian Provincial Universities | 37 |
| | B. Ministry of Agriculture Agricultural Training Centers and Facilities | 40 |
| | C. List of Research Units | 43 |
| | D. ARC - Professional Research Staff by Organizational Unit and Rank | 44 |
| | E. In-Country Training Plans | 47 |
| | F. Individual Information Questionnaire | 54 |
| | G. Management Development | 57 |
| | H. Training Procedures | 60 |


233

# NATIONAL AGRICULTURAL RESEARCH PROJECT
# NARP 263-0152
# MANPOWER DEVELOPMENT AND TRAINING PLAN

## SUMMARY

The effective implementation and execution of NARP will require changes in the operational thrust of the agricultural research system, especially in research management, technical research execution, research support and on the farmers level. These activities require careful planning, integration and implementation of manpower development and training programs. The NARP Manpower Development and Training Plan describes the planned integration and implementation of future development and training activities which will be conducted and funded under this project.

The Plan describes the background, process, objective, summarizes projected MOA/ARC agricultural strategies, ARC training list, training procedures and evaluation.

A summary of the components follows:

I. The Background establishes the need and gives the backgound for training in the NARP.

II. The Manpower Development and Training Objective identifies the principal objective which is to provide flexible training opportunites for qualified Egyptian agricultural managers, scientists, research staff, and support staff from the public and private sector.

III. The Manpower Development and Training Process shows that staff training must be consistent with projected strategies and plans of agricultural programs. When projected staff levels are compared to the present staff this identifies the gap and determines the types, level of training and methods of training that must be implemented to meet future needs.

Section A. Projected Agriculture Research Strategies and Needs, contains the summaries of the MOA/ARC present and projected activities.

Section B. Training Needs, summarizes the current staff at ARC, the ARC Activities, and the training needs for the different disciplines.

Section C. Training Plans, describes the components and the process in which the committee compiled the Training Activities. The complete list of out-of country training is in this section while the list of the in-country activities is contained in Appendix E.

234

Section D. Training Implementation states that the implementation will be conducted by the Manpower Development and Training Unit.

Section E. Training Evaluation states that all stages of the Process will include evaluation and monitoring.

# NARP MANPOWER DEVELOPMENT AND TRAINING PLAN

The NARP Manpower Development and Training Plan describes the planned integration and implementation of future development and training activities which will be conducted under NARP. This plan will be used to help organize the human and financial resources within the Egyptian agricultural community more efficiently and economically. The organization of the Plan is as follows:

I. Background

II. NARP Manpower Development and Training Objective

III. Manpower Development and Training Process

- A. Projected Agriculture Research Strategies and Needs
- B. Training Needs
- C. Training Plan
- D. Training Implementation
- E. Evaluation

## I. BACKGROUND

### A. NARP

The National Agricultural Research Project (NARP) USAID Project No. 263-0152 was established in September 1985. This is a cooperative agreement between the Government of Egypt's Ministry of Agriculture and Land Reclamation (GOE/MOA) and the United States Agency for International Development (USAID). NARP will assist in improving the capability of the Egyptian agricultural research community to generate and transfer improved agricultural technologies to Egyptian farmers.

The effective implementation and execution of NARP will require changes in the operational thrust of the agricultural research system especially in the research management, technical research execution, and research technology transfer to the farmers level. These changes require careful planning, integration and implementation of manpower development and training activities .

Manpower development and training activities within NARP will provide flexible development and training opportunities for individuals and groups. These opportunities will be available to staff and conducted by private and public sector organizations which have experience and interest in agricultural research and transfer of technology to farmers involved in agricultural production.

236

## B. Agriculture and Technology in Egypt

Egypt is facing many challenges in agriculture. Food and feed production needs to be increased to minimize the gap between consumption and production. The consumption of major food commodities significantly exceeds domestic supply due to increased per capita consumption as well as a rapid increase in population. Although Egypt has good natural resources - fertile land, an adequate supply of water and a stable climate, the productive land area is limited. Part of the solution in meeting the future food requirements lies in increasing crop yields and changing cropping patterns to intensify the use of both land and labor. Previous research projects in Egypt have shown that yields can be significantly increased when new technological practices are implemented on farmer's fields. In those projects, ARC staff conducted basic research, as well as research verification and demonstration trials on farmers' fields in order to test and transfer new agronomic practices and technologies.

Agricultural programs which are concerned with developing means to increase food and feed production must:

- Develop new basic research;
- Explore emerging technologies;
- Adapt technologies developed elsewhere for use in Egypt; and,
- Utilize suitable technology that has been developed in Egypt but not implemented on farmer's fields.

Improvement is needed in the following areas but not limited to:

- Nitrogen fixation by plants;
- Genetic engineering for plants and animals;
- Agrometeorology;
- Propagation of plants by tissue culture;
- Innovative procedures in animal and plant production;
- Integrated pest management;
- Advanced chemical analytical procedures;
- Protected plant culture; and,
- Aquaculture.

Methodology must be developed which will utilize computers in staff and research management systems and in integration analyses of data sets for modeling systems. New prototype machinery needs to be adapted or developed for conditions found in Egypt.

## C. NARP Manpower Development and Training

Manpower development and training in the agriculture sector is critical. Egypt's future will depend on having highly organized programs with trained managers, scientists and technicians who can develop and implement improved technology. Technological constraints in Egyptian agriculture is greater and more sophisticated than those operating in most other developing countries. Relatively high levels of productivity have indeed been achieved in Egypt.

237

At the present time younger, inexperienced researchers may benefit from training outside of Egypt. Many staff have been trained in Egyptian universities where there are different levels in the quality of the laboratories. In many universities there is heavy student enrollment in relation to the numbers of faculty and laboratories available. Some of the laboratories need state-of-the-art research equipment especially in the Egyptian Provincial Universities outside Metropolitan Cairo and Alexandria.. This was documented in a study by H.M. Ali, et. al., 1985[1] where an assessment was conducted on scientific manpower, research infrastructure, research funding and current research work. (For summary see Appendix A)

The staff need hands on, practical training in their disciplines which may require training outside of Egypt in U.S. universities, international research centers, or third country institutions that are known to provide the latest in technology in the specified fields. This will expand on the current knowledge being provided by local Universities by exposing the individual to new technology and systems of research. Egyptian researchers will be able to develop collaborative relationships with scientists in other countries who are working on similar activities.

Better coordination and management of research is also needed between and among the agriculturally oriented agencies to avoid duplication of efforts. The agencies and institutions which affect agricultural programs, research and training are listed below:

- Ministry of Agriculture;
- Agriculture Research Center;
- Fifteen Egyptian Universities with faculties of agriculture;
- National Research Centre;
- Desert Research Institute;
- National Academy of Scientific Research and Technology;
- Ministry of Irrigation Water Research Center; and,
- Private sector which conducts research.

## II. NARP MANPOWER DEVELOPMENT AND TRAINING OBJECTIVE

The principal objective is to provide flexible training opportunities for qualified Egyptian agricultural managers, scientists, research staff, and support staff from the public and private sector. The opportunities will center on basic, strategic, applied or adaptive research methods and techniques and management systems development. Individuals and groups of individuals will obtain:

---

[1] Ali, H.M., et al., "An Assessment Report of the Agricultural Research Environment: The Case of Egyptian Provincial Universities", Cairo, Egypt, 1985

- New knowledge or skills;
- Supplemental training; and,
- Training which will restructure their present research methods and techniques.

In addition to strengthening their managerial and technical capacities, the personnel trained by the Project may also be involved in formulation of development policies, the transfer of appropriate technology to other researchers and farmers or development of the indigenous private sector.

It is the GOE/MOA's intention that all management and research training provided by NARP will be specifically related to fields of study necessary for the improvement and development of Egypt's agricultural sector.

Training will be provided in the form of PhD, MSc, postdoctoral, short term, observational and invitational tours, and in country programs. The areas of priorities are listed below but not limited to:

- Research planning;
- Research management;
- Research techniques and methods;
- Information systems management;
- Data collection/analysis;
- Seed technology; and,
- Agricultural mechanization.

On Farm Trial staff will work with individuals and groups of farmers to conduct on-farm research The staff will involve farmers to test research and teach them to use new technology and new strategies of farming.

## III. MANPOWER DEVELOPMENT AND TRAINING PROCESS

People are one of the main components of the agricultural research system. Staff must be skilled in management to develop and organize the human, physical, financial and other resources important in the sound development of the agricultural system.

Manpower development and training in NARP will be coordinated by a Manpower Development and Training Unit. This Unit consists of the Training Committee, the Consortium for International Development Advisor, and assigned staff. The Training Committee will participate in management of the training component and will act as advisors to the NARP Director General. Staff assigned to the Unit will implement the program and should become an integral part of the system. The staff will be trained to organize and implement such areas as English training, trainee selection, in-country training, reporting and evaluation of programs. .

Manpower development concerns analyzing, developing and implementing overall procedures for the general growth of the individual and/or the organization. Conditions concerning organizational structure, management practices, training opportunities, promotion criteria, hiring and termination

839

procedures and evaluation of staff will be important items considered in order to improve and ensure a productive, capable staff in the agricultural research system.

While manpower development will concentrate on the overall growth of the organization, training will focus on the individual's learning that will help staff in their present or future job in the MOA to achieve effective and efficient agricultural research generation and transfer in Egypt.

As pictured in Figure 1, The Manpower Development and Training Process will be used to implement the specific steps needed to achieve the goal of having a cadre of trained scientists and support staff within the agricultural system. This will be the basis in which to plan, manage and implement needed technology for improved and increased food and feed production.

## A. Projected Agriculture Research Strategies and Needs

Projected program goals, objectives and activities have been summarized from the MOA strategies and ARC Plans. These strategies and plans help project the priorities in agriculture and were considered in formulating the plans for manpower development and training.

1. Ministry of Agriculture

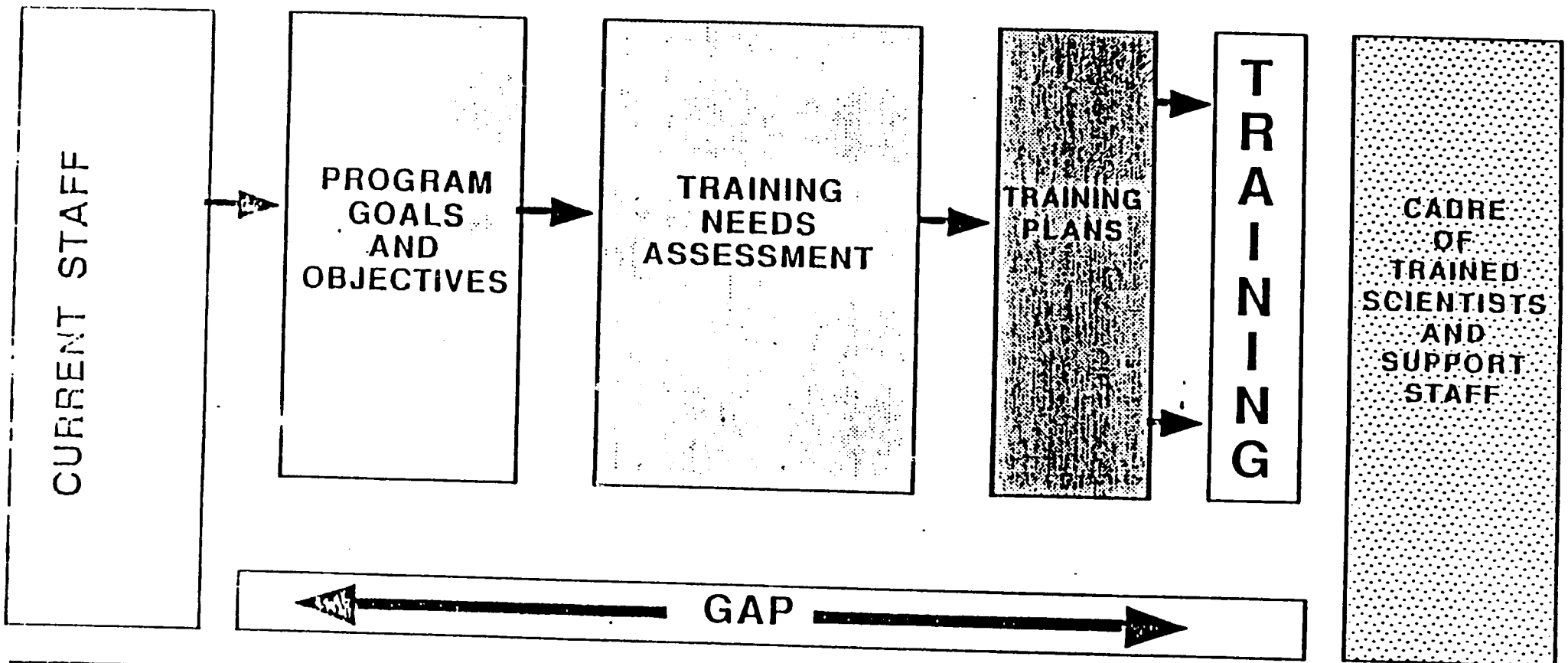
A report by Minister of Agriculture and Land Reclamation, Dr. Youssef Wally, "Strategy of Agricultural Development in the Eighties"[2] outlines recommendations for formulating agricultural development objectives and policies in Egypt. Some of the important strategies which relate to the setting of priorities in training are as follows:

- Maximization of net agricultural national product requires directing agricultural resources toward producing products that conform with the principles of specialization and comparative advantage. It calls for measures of policies which increase the productivity of land, labor, capital and organizational aspects of production. It requires the adoption of optimum cropping and land use patterns, and appropriate technological progress in agriculture;

- Future agricultural policy should amend food priorities as related to food security and adjust agricultural development policy in a complementary manner. Highest priority should be given to food commodities required by the vast majority of the population, especially those primarily consumed by low income groups. Thus, greater priority should be given to cereals and pulses than to meat. Dairy products should also be emphasized over red meat;

---

[2] Wally, Youssef. "Strategy of Agricultural Development in the Eighties." Report printed by the Ministry of Agriculture and Land Reclamation, Cairo Egypt, March 1982.




THE TRAINING AND MANPOWER DEVELOPMENT PROCESS

- Future policies must emphasize the interests of small farmers;

- Effective linkages must be made between farmers and research centers so that the efficiency of agricultural production is enhanced and the net national agricultural product is increased as soon as possible;

- Conservation and maintenance of land productivity will require an integrated set of programs centering around rational uses of irrigation water, additional fertilizer and appropriate cropping patterns;

- Yields of maize and rice should be boosted to satisfy domestic consumption requirements, as well as sufficient surplus of rice to allow for export. Yields of pulses should be increased to levels which will allow maintenance of existing rates of self-sufficiency for poultry, of dairy and fish production;

- Increase yields of different crops, particularly when available research confirms the likelihood of achievement (such as maize and rice). The Ministry will use all appropriate means and programs including improved seeds, adjusting rates of fertilization, and providing pesticides and chemicals for pest control;

- Plans will be made to adopt a long-term policy for transfer of biological technology on a broad scale for field and horticultural crops. This will emphasize certified seeds, high yielding varieties, fertilization practices, pest control and/or post-harvest treatments. It will involve transfer of advanced biological technology for livestock, including high yielding breeds, improved nutrition and effective use of crop by-products and green fodders;

- Modern breeding measures will be adopted to achieve an improved productivity of a domestic breed. Livestock should be freed from draft so that more resources can be devoted to production of meat and milk. Technical as well as socio-economic studies will be carried out to provide the basis for a well-formulated policy in this respect. Various sources of energy and substitutes for draft animals will be investigated. Extension and veterinary services for the Livestock Sector will be improved and expanded, especially with respect to personnel, equipment, vaccines and drugs;

- In mechanization, promotion will be made to use and arrange the availability of appropriate machinery, equipment and tools to increase the efficiency of both human and animal energy in a manner consistent with economic and social conditions in Egypt. Research centers and engineering companies will be encouraged to design and produce machines that represent appropriate mechanical technology for Egypt;

- Long-term strategies must improve human resources to be integrated with Egypt's education policy. Pragmatic educational training policies should be adopted to enhance the performance

and develop personal abilities of the agricultural labor force. The MOA, its agencies and those of other ministries should be used for these purposes; and

- Training should be given to Egyptian officials responsible for the planning, management and implementation of agricultural policy. Special attention should be given to the training and briefing of research staffs to promote technological advancement for agriculture. Greater research, improved extension education, and improved management of institutions and policies are crucial for on going and long-run development of Egyptian agriculture.

2. Agricultural Research Center (ARC)

The Agricultural Research Center is the principal body authorized to conduct applied research to maximize production. The Center contains 14 Research Institutes, 3 Laboratories, 1 Administrative Unit, Breeder Seeds on State Farms Unit, and an On-Farm Trials Department (for detailed list see appendix C). There are also 31 research stations within the organization.

ARC develops plans every five years which contain the priority activities to be implemented. The research plan is correlated to the agricultural development plan on the national level. The last five year plan emphasized increasing production in the following: cotton and fibers, wheat and barley, maize and guinea corn, rice, oil seeds and onions, sugar crops, legumes and feeds, fruits, vegetables, ornamental, medicinal and aromatic plants, milk, poultry and fish.

A priority was put on increasing production especially for export in vegetables, fruits and flowers.

New techniques to achieve production lies in designing and managing:

- Effective integrated agricultural research and management;
- Improved cropping methods;
- Effective systems of reaching the small farmers at the village level by integrating research and extension;
- Systems for production and marketing of seeds selected from field and orchard crops; and,
- Effective mechanization adapted to Egyptian conditions.

In early 1987 the NARP Director General requested all Research Units to develop a list of research activities that are needed by agronomic zone. This list has been completed and it contains 948 research activities related to constraints, institutes, crops,

---

MOA has instituted agricultural technical and management training centers throughout Egypt. The facilities managed by the Central Administration for Administrative Development (CAAD) are given in a detailed list in Appendix B.

commodities, strategies, and disciplines. These activities have been separated into agronomic zones. At this time, the institutes and laboratories are defining the priorities of the research activities. This list will be used as a guide to help determine future priorities in training. It can provide guidance to the type of knowledge and skills that will be needed by staff.

## B. Training Needs

An essential part of the manpower development and training process is to analyze the needs of the individuals within the organization and the needs of the organization. A systems approach to further assess the needs will be implemented to achieve better planning and results in NARP. In January 1987 the beginning assessment was implemented to:

1. Use the MOA Plans and the ARC Five Year Plans and Activity Plans as the basis of the priorities of research activities of the agricultural system;

2. Develop interaction between the Manpower Development and Training Unit, the Research Unit Directors and MOA/ARC staff to define the perceived needs for training in relation to future needs; and,

3. Create a dialogue to help set priorities according to types and levels of training to be implemented;

An inventory of current human and physical resources within the ARC involved analyzing the following to show the relationships between:

1. Current numbers of ARC staff, their level of training, positions, birthdate, date of appointment and placement within research units; and,.

2. Perceived manpower and training needs of the Research Units for the coming 6 years.

The inventories contain data from personnel records, questionnaires from Research Unit Directors and reports from the MOA/ARC.

### AGRICULTURAL RESEARCH CENTER PERSONNEL INVENTORY

The ARC has the authority to conduct agricultural research and extension in Egypt. A summary made from the personnel files showed the number of staff, date of appointment, educational level, and position within the research units. Of the approximate 2500 scientists the following gives a breakdown according to jobs, degrees and age categories:

The percent of staff according to organizational rank are as follows (For detailed list see Appendix D).

| | |
|---|---|
| Professor | 11% |
| Associate Professor | 11% |
| Researcher | 28% |
| Associate Researcher | 39% |
| Assistant Researcher | 11% |

The percent of staff according to degree are as follows:

| | |
|---|---|
| Ph.D. | 50% |
| M.Sc. | 39% |
| B.Sc. | 11% |

The percent of staff according to age are as follows:

| | |
|---|---|
| Over 50 years of age | 17% |
| 40 - 49 years old | 42% |
| 30 - 39 years old | 40% |
| 25 - 29 years old | 1% |

Within ARC, approximately 26,000 employees in addition to the scientists work in 22 research units and 31 research stations in the following categories.

Professionals with degrees:

| | |
|---|---|
| Agronomists | 4,630 |
| Veterinarians | 899 |
| Engineers | 192 |
| Sociologists | 25 |
| Librarians | 24 |
| Lawyers | 87 |
| Statisticians | 4 |
| Social Science | 104 |
| Accountants | 490 |
| Management | 407 |

Non-Professionals, Technicians:

| | |
|---|---|
| Agriculture | 2,224 |
| Engineering | 574 |
| Laboratory | 19 |

Skilled Laborers:

| | |
|---|---|
| Mechanical & Workshops | 1,014 |
| Agriculture | 1,594 |
| Transportation | 1,236 |
| Construction | 298 |

| | |
|---|---|
| Clerks | 3,750 |
| Unskilled Laborers | 9,053 |

## PERCEIVED TRAINING NEEDS BY ARC RESEARCH UNIT DIRECTORS

The NARP Training Committee requested the Research Unit Directors to submit their lists for academic, post-doctoral, short term, and in country training. As stated above the training requested was to be put into priority and determined from their analysis between the present staff in relation to the future needs of the research unit and the MOA/ARC. These lists were compiled by the committee. At this time the Committee members met with the Unit Directors and asked for the justification of the lists submitted. After this the lists of trainees submitted were evaluated according to the priorities of the MOA/ARC, and available budget. The lists as compiled by the committee is summarized as follows (Specific field of training and justification is given in Section IIIC for the PhD and postdoctoral training. The in-country training is outlined in Appendix E.

| Research Unit | PhD | Postdoctoral |
|---|---|---|
| Field Crops Institute | 11 | 25 |
| Cotton-Fiber Institute | 3 | 8 |
| Sugar Institute | 5 | 10 |
| Horticulture Institute | 8 | 20 |
| Animal Production Institute | 6 | 12 |
| Animal Health Institute | 3 | 8 |
| Veterinary Serum and Vaccine Institute | 1 | 4 |
| Animal Reproduction Institute | 2 | 8 |
| Soils and Water Institute | 5 | 20 |
| Plant Pathology Institute | 2 | 16 |
| Plant Protection Institute | 2 | 18 |
| Agricultural Mechanization Institute | 9 | 4 |
| Agricultural Economics Institute | 3 | 10 |
| Extension and Rural Development Institute. | 3 | 4 |
| Central Agricultural Pesticides Laboratory | 2 | 4 |
| Central Laboratory for Food and Feed | 2 | 4 |
| Central Laboratory for Agricultural Statistics | 2 | 2 |
| Central Organization for Seeds | | 6 |
| On-Farm Trials Department | 4 | 5 |
| Research Stations | | 5 |
| Administrative Unit | | 3 |
| Center for Agricultural Management. Development | 3 | 2 |
| Aquaculture | | |
| Information Systems | | 2 |
| TOTAL | 77 | 200 |

Short term training opportunities will be available for approximately 200 staff from the above institutes, departments and laboratories. A yearly plan will determine the number and kinds of opportunities available for each short term training, observational trip and invitational tour. Approximately 80 of the staff will participate in the short term training and 120 staff will be scheduled for observational trips and invitational tours.

In country Training will be planned yearly and approximately 58 different kinds of training has been targeted which will total about 50,000 opportunities for people to receive in country training. However in the 50,000 total some people may receive training more than one time. (Specific plans are given in Appendix E.)

## PERCEIVED TRAINING NEEDS BY RESEARCH STUDIES PROGRAM

The Research Studies Program will involve grants to Egyptian universities and private sector research groups in Egypt. It is designed to augment the ARC research program especially in adaptive research within agronomic zones that are close to the institution. Training will be needed especially at the postdoctoral level and in short term and observational travel to enhance the flow of information and data on relevant applied research. Linkages need to be developed between Egyptian University staff and United States Universities, international agricultural research centers and private sector companies.

The Egyptian Universities will offer proposals in January 1988. Specific training needs are not available at this time but it is estimated that the following will be needed:

| Type of Training | Number of Trainees |
|---|---|
| Postdoctoral Training | 20 - 100 |
| Short Term Training | 5 - 20 |
| Observational Travel | 80 - 250 |

## FUTURE NEEDS EVALUATION

The present evaluation of needs will continue throughout the project. The Manpower Development and Training Unit will work with the directors of the research units and the CID Technical Assistance Team to further define the specific training needs of the agricultural system according to the following steps:

1. Individuals will be nominated and specific training plans will be designed according to the priorities of the ARC Plan and the needs of the Research Units;

2. Update current staff information by adding information about the institution where current staff obtained their degree, thesis topic, additional training in last two years, and professional papers published. Forms which have been developed for this purpose are contained in Appendix F;

3. Continue to clarify the training requested by individuals within the organization to implement an effective training program;

4. Provide opportunities for staff who have participated in training to provide feed-back on the value of training in relation to their needs and to the jobs in which they are assigned;

5. Establish a basis for creating, implementing and evaluating manpower development and training opportunities; and,

6. Document the changes according to needs and improvements in manpower development and planning in the agriculture system as training opportunities are provided.

The initial staff data and training plans have been compiled on computers and will be continuously revised and updated in response to new developments within NARP.

## C. Manpower Development and Training Plans

Manpower development and training opportunities must be varied and diverse in order to obtain an effective and efficient cadre of researchers.

The objective of the manpower development and training plan is to establish and describe an overall plan of action for MOA/ARC personnel and private sector individuals. This plan outlines future actions, the projected number of people to be trained, methods and levels of training under NARP, selection criteria for participants, and specific objectives of training.

A Manpower Development and Training Unit comprised of a NARP Training Committee assisted by staff and the CID Manpower Development and Training Advisor will plan, develop and implement activities designed to upgrade the agricultural research community as well as to monitor and evaluate the system.

In Manpower Development the activities implemented will:

1. Evaluate present manpower development and training system, develop and implement improved procedures within the MOA/ARC system;

2. Design and implement a personnel management system with skills inventories and on going needs evaluations;

3. Implement and coordinate training plans and procedures; and,

4. Provide liaison in training between USAID, international research centers, U.S. universities or other agencies concerned with training.

In Training, activities will be developed and implemented to help MOA/ARC

248.

agricultural staff and individuals in the private sector:

1. Acquire new knowledge, skills or attitudes in research and management areas that are relevant to research priorities associated with agricultural production and technological development in Egypt;

2. Acquire new information and experience that is necessary to restructure skills needed for research, management, research laboratory techniques, research field operations, maintenance and other research support activities;

3. Obtain hands-on experience in research activities that will improve job performance;

4. Obtain information and knowledge that will upgrade staff professionalism and interest;

5. Develop cooperation with other staff or provide liaison with other organizations;

6. Present research results of findings; and,

7. Increase the efficiency of the research and research support services in the public and private sector offered to the farmer.

The specific learning objectives for each trainee or groups of trainees will be developed according to the needs of the individual and the organization in a *Training Implementation Plan* (TIP) which will contain:

1. Type of training needed;

2 Length of time allocated for training;

3. Level of knowledge, skill and attitudes to be learned;

4. Preferred site for training; and,

5. Ultimate job title and work to be performed when training is completed.

The training plan includes a description of the various components, description of proposed training, charts of the planned training activities and budgets.

## DESCRIPTION OF COMPONENTS

1. Research and Management Training

Agricultural research is a complex task and can be classified in many ways but the terminology will be used as suggested in the Second Review of Consultative Group on International Agricultural Research (CGIAR). When referring to research in this document the following definitions apply.

- Basic research is designed to generate new understanding.
- Strategic research is designed for the solution of specific research problems.
- Applied research is designed to create new technology.
- Adaptive research is designed to adjust technology to the specific needs of a particular set of environmental conditions.

Management skills are needed by executive level, middle level and supervisory level managers to help in increased productivity of the people within the agricultural research system. People need managerial skills training in such areas as planning, leadership, decision making, group dynamics, organizational development, motivation, listening and time management. A more detailed management development strategy is shown in Appendix G.

2. Levels of Staff to be trained

Categories of staff to be trained are:

- Policy makers --High level government officials who help develop and implement policy for the agricultural sector;

- Administrators--Director or deputy directors and heads of departments or section;

- Research professor--Promotion to this level is possible upon approved by a committee after a person has been an Associate Professor for at least five years;

- Associate professor--A Researcher with a Ph.D. who has been with the ARC at least five years and has upon approval of a committee been promoted;

- Researcher--Individual with a new Ph.D. degree;

- Associate researcher--Individual with a M.Sc. degree;

- Assistant researcher--Individual with a B.Sc. degree with a score of very good in the University;

- Subject Matter Specialist--Experienced researcher who trains village extension workers in agricultural production and

demonstration methods;

- Support Staff--Staff who are part of the system with degrees but they function as agronomists, veterinarians, accountants, lawyers, statisticians, engineers, management, and other support;

- Technicians--Staff who have intermediate technical degrees but work with staff in agriculture, engineering, and laboratories;

- Skilled Laborers--Skilled staff without degrees who work in the workshops, agriculture, transportation and construction;

- Clerks--Staff who work in typing, filing and clerical duties;

- Unskilled laborers--People who work in the fields, building maintenance and cleaning, research stations, etc;

- Private Sector Companies or Individuals--Companies or individuals who provide services to the agricultural sector or farmers such as seed technology or mechanization. They can participate in training or be contracted to provide training services; and,

- Farmers--Individuals or groups of farmers who receive instruction through the On-Farm Trials program concerning technical packages, agricultural strategies or general agricultural problems.

3. Fields of Training

The participants will be trained in the following fields, but not limited to:

Agricultural Administration and Management
Farming Systems
Genetic Engineering
Sugar Crops Physiology and Technology
Animal Health, Production and Reproduction
Soil and Water Management
Agricultural Economics
Food and Dairy Microbiology and Technology
Biological Evaluation of Feed
Financial Administration
Information Systems Management
Field Crops Breeding, Physiology Production and Management
Fiber Crops Technology
Horticulture Science and Protected Culture
Agricultural Mechanization
Integrated Crop Protection and Pest Management
Seed Technology
Aquaculture
Extension Education

4. Types of Training

The training will focus on the following types:

a. PhD Academic Training

Associate researchers or assistant researchers will obtain Ph.D. degrees at U.S. Universities, Egyptian Universities or third country institutions in those areas which are of priority in the GOE/MOA NARP Master Training Plan (MTP). The trainee's formal classwork and research work will be performed according to one of the following alternatives.

- Type 1

Formal classwork will be conducted in Egypt at an Egyptian University. The research work will be performed completely or partially outside of Egypt. After performing the classwork, the trainee will travel to an institution outside of Egypt for up to 2 years to conduct research, analyze data and to complete the dissertation according to the "channel system" or the trainee may choose to use a lesser amount of time outside of Egypt and return to Egypt to complete the research, analyze data and complete the dissertation.. An advisor will be appointed in Egypt, a supervisor outside of Egypt, to help the trainee complete the requirements for a degree. The degree will be awarded from the Egyptian University.

- Type 2

Formal classwork will be conducted for up to 24 months outside of Egypt at a U.S. University or third country institution. The research work will be conducted in Egypt. The research will be coordinated with an Egyptian institution which will also provide a research supervisor and a research site. The degree will be awarded from the training institution outside of Egypt.

- Type 3

Formal classwork and research will be conducted outside of Egypt for a duration of up to 4 years, and contain education and training related to agricultural problems in Egypt. The area of study will focus on new or special technology which may not be possible for either the academic study or research work to be conducted in Egyptian Institutions.

b. MSc Degree

Masters degrees will be allowed in limited instances for a period of up to 24 months in the United States or third countries. These opportunities will be allowed only when the MSc is a terminal degree or the training is not needed at the PhD level. In both instances the training can only be justified if the training is not available in Egypt.

c. Postdoctoral Study

Administrators, senior researchers or researchers in various levels of management responsibilities will study long term (more than 3 months but not more than one calendar year) in postdoctoral study programs at U .S. Universities or governmental agencies, international research centers, and third country training centers or in private industry. They will acquire new knowledge or skills, supplemental or updated new technical hands on training in high priority research areas.

d. Short-term Training, Out-of-Country (less than 6 months)

- Type 1

Trainees will be provided short-term training at U.S. Universities, governmental or private agencies; international agricultural research centers or third country institutions. This management or research training will be designed for up to six months for all organizational levels, whether managers, researchers, scientists or technicians. They will receive practical, hands-on training based on needed knowledge, skills or attitudes necessary to improve job performance.

- Type 2

Observational tours and invitational travel will be allowed for senior-administrators and scientists to travel to other countries for short periods of time. The travel will be provided for staff to visit facilities or attend conferences, seminars, and workshops to learn a process, method or system which will help the individual acquire new ideas, attitudes, and skills.

e. Short term training, in country

Participants from all levels of the agricultural research system, private sector or farm community will participate in formal and non-formal training. This will be provided in short courses workshops, seminars, meetings and individual contact. Services can be contracted from individuals or organizations

within Egypt or the U.S. (U.S. Universities, USDA and private industry sector); international agricultural research centers, or Third Country Institutions.

5. Category of Training

Training will be categorized according to:

a. English training

English testing and training will be instituted for participants to improve their English skills necessary for academic or short term training in the U.S. English training will also be provided for staff to improve their skills for on-the-job performance for research and management within Egypt.

b. Management training

This training will be provided to executive , middle, and supervisory level managers to help them better organize and develop methods to utilize the human., financial and physical resources within the agricultural system.

c. Academic training

This type of training is provided to doctoral and postdoctoral participants. The knowledge and skills acquired by an individual will be used in his/her future job but perhaps not utilized immediately but is needed for continuity of research activities after the life of the project.

d. Technical training

This will be practical, hand-on-training for all levels of staff in the form of short term, postdoctoral and in country training that can be utilized right away to improve a participant's job performance

PLANNED TRAINING ACTIVITIES

1. Selection of training opportunities

As stated before in Section B the Training Committee sent questionnaires to the Research Units asking them to describe the academic, postdoctoral, short term and in country training that was needed. Each research unit based on future research requirements over the next 5-10 years requested training considering the strategies of the MOA/ARC. They were also asked

254

to describe the fields of training and to justify their needs. Members of the Committee then compiled the lists and further refined them by correspondence or by direct contact with the Directors. The final lists were determined by the Committee according to availability of funds and overall priorities of the GOE/MOA/ARC.

2. Overall Justification for Out of Country Training

Academic training is needed especially when staff lack knowledge about new technology or when staff at the researcher level need training to replace senior level staff. Sometimes a shortage of staff occurs in the different disciplines because senior level staff are retiring or working in other countries. In several instances the institutes have been recently established and staff need to be trained. It is also necessary to broaden the experience of staff in different disciplines if a majority of the staff have been trained only in Egypt.

As outlined previously the academic training plan calls for Type 1 and Type 2 training which is a combination of study and research inside and outside Egypt. Type 1 is structured so that the trainee can obtain classwork at an Egyptian University but conduct the research work at a site outside of Egypt which is well noted for the specific type of research which relates to the trainee's plan. Type 2 allows the trainee to strengthen and broaden academic knowledge already gained in previous studies in Egypt by attending classwork outside of Egypt. The research work will be conducted at a scientific site in Egypt and aimed at important problems within Egyptian agriculture.

These two types are innovative because it broadens the trainees knowledge while it develops international linkages, cooperation and collaboration between Egyptian institutions and:

a. Universities and organizations in developed countries such as the United States;

b. International agricultural research centers (IARC'S);

c. Third world countries with similar development problems such as India and Philippines; and

d. Third world country research programs where there is a similarity between the two environments.

In some cases both the academic and research work will be conducted outside Egypt when there is a shortage in new disciplines or disciplines not adequately covered in Egypt.

In the needs assessment, the research units requested post-doctoral training (academic-nondegree work) because:

a. Senior level scientists need to update knowledge about research innovations and be acquainted with modern technology which can be adapted to Egyptian environments;

b. Junior level researchers need to obtain more experience in using modern techniques to initiate research programs in Egypt that has relevance in applied technology. This will develop opportunities for new leaders in specific disciplines;

c. Staff will be used to train other scientists when they return to Egypt and since they will learn about and use new technology their ideas will be helpful and needed in acquiring new and needed up to date equipment; and,

d. Training in fields i.e. socio-economics, information dissemination and research management will have a direct impact on appropriate use of available resources that will help MOA in policy decisions and actions which are appropriate to the prevailing environment to increase income from agriculture.

Short term technical training is especially needed when staff need to up-date their knowledge in specific areas, learn how to operate or use special kinds of equipment. Since technology is increasing at a rapid rate it is also necessary for scientists to interact with others to exchange information or view certain experiments that are in progress in other countries.

Attendance at international conferences, workshops and seminars will help staff contribute and expand technology transfer when they can share knowledge with other scientific leaders about major topics of concern. Meeting with other staff from international research centers will help develop and encourage similar activities in Egypt.

3. Training Activities; PhD and postdoctoral

a. The charts for the academic training - PhD gives the following information:

<u>INS</u>- Name of Research Unit (Institute, Department or Laboratory)

1. Field Crops Institute
2. Fiber Crops Institute
3. Sugar Institute
4. Horticulture Institute
5. Animal Production Institute
6. Animal Health Institute

7. Veterinary Serum & Vaccine Institute
8. Animal Reproduction Institute
9. Soils and Water Institute
10. Plant Pathology Institute
11. Plant Protection Institute
12. Agricultural Mechanization Institute
13. Agricultural Economics Institute
14. Extension and Rural Development
15. Central Agriculture Pesticides Laboratory
16. Central Laboratory for Food and Feed
17. Central Laboratory for Agricultural Statistics
18. Central Organization for Seeds
19. Breeder Seeds "State Farm"
20. On-Farm Trials Department
21. Research Stations (31)
22. Administrative Unit
23. Library and Information Services
24. Center for Agricultural Management Development

NO - Number of the each training opportunity in the Research Unit.

Field of Study and Major Emphasis -The area of emphasis which is desired for the trainee. The department where the trainee enrolls and the degree will depend on the university selected for training.

Type - Designates the type of training

Justification - States the need for the training

b. Postdoctoral training charts give the following:

INS - Research Unit numbers as above

# - Number of trainees

Field of Training - Area of needed training

4. In-country Training Plans

The In country Training Plan shows the field of training activities, and number of estimated training opportunities for the next five years in Appendix E.

## ACADEMIC TRAINING - PHD DEGREES

| INS | NO | FIELD OF STUDY | MAJOR EMPHASIS | TYPE | JUSTIFICATION |
|---|---|---|---|---|---|
| 1 | 1 | Rice breeding- disease resistance | Genetics major, pathology minor with reference to blast disease | 1/2 | New breeding technology, philosophy and literature for blast disease resistance. |
| 1 | 2 | Legume breeding disease resistance | Genetics major, pathology minor with reference to soybeans | 1/2 | Foliar and soil borne pathogen control |
| 1 | 3 | Crop breeding under stress condition | Genetics, physiology, pathology and biometrics with reference to wheat, barley, forage and oil crops | 1/2 | New methodology for evaluating physiological effects on plants and genetic control |
| 1 | 4 | Oil crops-breeding | Genetics major, biometrics minor with reference to sunflower | 1/2 | New methods and technology of breeding and product use. |
| 1 | 5 | Corn breeding-disease resistance | Genetics major, pathology minor with reference to late wilt | 1/2 | New methods and technology of breeding and product use. |
| 1 | 6 | Wheat breeding disease resistance | Genetics major, pathology minor with reference to rusts | 1/2 | New philosophy of wheat breeding for resistance. |
| 1 | 7 | Forage breeding | Genetics major, biometrics minor with reference to sorghum and millets | 1/2 | New philosophy of forage breeding for resistance. |
| | | | | | In the following training, there is a lack of the speciality and training in Egypt. Staff need: |
| 1 | 8 | Genetic Engineering | Field crops major with reference to biochemistry, biotechnology, tissue culture, etc. | 3 | New methodology and application in this field |
| 1 | 9 | Seed Technology | Seed physiology and pests | 3 | Pest control by chemicals and physiological methods. |
| 1 | 10 | Farming Systems | Crop rotation systems, management, production, plant physiology and agriculture economics | 3 | Socio-economic study of agricultural systems |
| 1 | 11 | Germplasm storage - maintenance | Plant genetic resources. Plant genetics major, botany minor with training in plant physiology and taxonomy | 3 | Cataloging, storing, treating and dispersement of seed. |
| 2 | 1 | Breeding cotton improvement | - Incorporating earliness in G. barbadense while maintaing yield and quality<br>- Disease resistance in G. barbadense especially damping-off and Fusarium wilt<br>- Insect resistance utilizing physiological plant characters as suppressants | 1/2 | Lack of Institute staff trained in this field |

## ACADEMIC TRAINING - PHD DEGREES

| | | FIELD OF STUDY | MAJOR EMPHASIS | TYPE | JUSTIFICATION |
|---|---|---|---|---|---|
| 2 | 2 | Fiber crop physiology | - Utilizing plant growth regulators in production and picking of G. barbadense cotton | 1/2 | Insufficient institute staff in this speciality |
| 2 | 3 | Fiber technology | - Value of cotton fiber structure in improving yarn properties of G. barbadense<br>- Response of cotton fibers to mercerization<br>- Study of mechanical properties of cotton fibers and yarn | 1/2 | Insufficient number of staff in this field |
| 3 | 1 | Breeding sugar crops | Breeding for high sucrose and syrup | 1/2 | New methods and philosophy of breeding for high sugar production |
| 3 | 2 | Agronomy-Sugar crops | Improvement of sugar crops production | 1/2 | Cultural parctices and new approaches to production |
| 3 | 3 | Physiology and technolo of sugar crops | Physiology of flowering, technology and analysis for syrup and sugar content | 1/2 | End-product usage of food and feed products. |
| 3 | 4 | Pathology - sugar crops | Sugar crop diseases | 1/2 | New philosophy and knowledge of diseases of sugar crops. |
| 3 | 5 | Sugar crop protection | Sugar crops borers and biological control | 1/2 | Chemical and biological control methods for sugar crop pests. |
| 4 | 1 | Genetic engineering | Biotechnological manipulation of genetic material and application. | 3 | Scientific pesonnel in this horticultural field is needed This discipline is lacking in the Egyptian Universities |
| 4 | 2 | Plasticulture of horti culture crops | Breeding vegetable hybrids for production in green houses | 1/2 | Scientists need specialized integrated knowledge to initiate new high producing & quality hybrids |
| 4 | 3 | Plasticulture of horti-culture crops | Means of controlling - atmosphere, temperature, humidity, soil condition, etc.in a semi-arid environment | 3 | Scientific personnel specialized in micro-climatic control are not found. They are needed for planning efficient production of plants in protected cultivation with minimal requirements of energy |
| 4 | 4 | Post harvest biology | Post harvest treatment of horticultural commodities | 1/2 | Staff lack knowledge in new theoretical aspects related to fruit biology related to extending the shelf life of horticultural commodities and reducing the post-harvest losses of fruits. |
| 4 | 5 | Fruit breeding | Fruit tree breeding improvement: Citrus, grapes, mango, dates, banana, apples, etc. | 1/2 | Lack of staff to fulfill national plans for the improvement of fruit crops by breeding. Staff needed to guide various breeding programs. |

## ACADEMIC TRAINING - PHD DEGREES

| INS | NO | FIELD OF STUDY | MAJOR EMPHASIS | TYPE | JUSTIFICATION |
|---|---|---|---|---|---|
| 4 | 6 | Plant taxonomy | Basic research in study of plant flora and related aspects | 1/2 | Staff needed in plant taxonomy to initiate and guide programs of studying Egyptian flora and endogenous plants |
| 4 | 7 | Seed propagation | Vegetable seed certification and propagation technology. | 3 | Need to strengthen staff in theory of seed viability, certification and testing. Adequate program not available in Egypt. |
| 4 | 8 | Germplasm maintenance and storage | Plant genetic resources: Collection, purification, description and technology of preservation | 3 | Staff needed for national program for purification and maintenance of horticultural germplasm. Staff |
| 5 | 1 | Genetic engineering | Biotechnological manipulation of genetic materials for application in animal breeding | 3 | Lack of staff in this speciality |
| 5 | 2 | Farming systems | Inter and intra species livestock production systems as a part of an integrated farming system | 3 | Lack of staff in this speciality |
| 5 | 3 | Breeding - small ruminants | Genetic improvement of sheep and goats for efficient production under subtropical condition. | 1/2 | Insufficient institute staff in this area |
| 5 | 4 | Breeding - large ruminants | Genetic improvement of dairy animals for gigher milk production under subtropical condition | 1/2 | Insufficient institute staff in this area |
| 5 | 5 | Rumen fermentation | Effect of micro-organisms on digestion and metabolism in the in the rumen | 1/2 | Insufficient institute staff in this area |
| 5 | 6 | Breeding - Poultry | Genetic improvement of poultry with emphasis on resistance to diseases under sub tropical conditions | 1/2 | Lack of trained institute staff in this area |
| 6 | 1 | Animal d[illegible] | Immuno stimulant and immuno supressive effects of veterinary drugs | 1/2 | Lack of trained staff |
| 6 | 2 | Poultry diseases | Inheritant maternal immunity against infectious poultry diseases | 1/2 | Lack of trained staff in natural genetical immunity as basis for hybridization |
| 6 | 3 | Fish diseases | Immunization against aeromonsis | 1/2 | Lack of speciality |
| 7 | 1 | Diagnostic product [illegible] | Diagnostic research on anitgens and vaccine for cattle | 3 | Lack of speciality in this area |
| 8 | 1 | Artificial insemination | Diagnosis of semen born diseases | 1/2 | Insufficient trained staff in this area |
| 8 | 2 | Embryo transfer | Recent techniques in embryo transfer , surgical and nonsurgical | 3 | Lack of speciality in the institute |



260

## ACADEMIC TRAINING - PHD DEGREES

| ITS | NO | FIELD OF STUDY | MAJOR EMPHASIS | TYPE | JUSTIFICATION |
|---|---|---|---|---|---|
| 9 | 1 | Biological nitrogen fixation | Biological nitrogen fixation by rhizobia: Emphasis on molecular structure, genetic engineering, mass production and host response and specificity | 1/2 | Strenghten existing staff at the researchers level to replace retiring staff. |
| 9 | 2 | Soil fertility and plant nutrition | Requirements of plants for microelements, translocation of elements in plants, deficiency problems and methods of curing, critical levels of nutrients in plants and soils, soil testing and leaf analysis, soluble fertilizers for foliar application | 1/2 | Strenghten existing staff at the researchers level to replace retiring staff. |
| 9 | 3 | Modern irrigation technology | - New systems of modern irrigation: Drip, sprinklers, micro irrigation and capillary tubes<br>- Mathematical models for water management and use | 1/2 | Strenghten existing staff at the researchers level to replace retiring staff. |
| 9 | 4 | Sodic Soil Amelioration | - Field studies on soil reclamation to determine most effective placement of amendments in terms of soil location and time<br>- Application of saline water in reclamation | 1/2 | Strenghten existing staff at the researchers level to replace retiring staff. |
| 9 | 5 | Renewable Energy | - Biomethanation of crop residues to produce energy and organic manure and/or soil conditioners.<br>- Alcohol fermentation for production of liquid fuel from crop residues and low value crops | 1/2 | Lack of speciality exists in this area |
| 10 | 1 | Foliation disease complex | - Study of the taxonomy of nematodes<br>- Nematode virus transmission | 1/2 | Lack of staff in this area |
| 10 | 2 | Microbial pesticides (biocontrol) | - Exploration of biotic agents for disease control<br>- Cultural practices in the activity of biocontrol agents<br>- Pesticide effect on the activity with bioagent<br>- Integration of biocontrol with chemical control | 1/2 | Lack of knowledge exists in this area in the institute Biological control will reduce need for pesticides (chemicals) |
| 11 | 1 | Biological control | Mass rearing parasites and predators:<br>1. Culture and nutrition of entomophagous insects and their hosts<br>2. Insectary facilities & equipment for mass rearing of entomaophagous insects<br>3. Mass production programs<br>4. Methods of colonization, recovery and evaluation | 1/2 | Progam will have environmental impact by minimizing use of chemicals. Need to ungrade existing staff to replace retiring staff. |
| 11 | 2 | Microbial pesticides | Use of Bacillus thuringiensis through an IPM program | 1/2 | Lack of speciality in this area. |

## ACADEMIC TRAINING - PHD DEGREES

| [illegible] | NO | FIELD OF STUDY | MAJOR EMPHASIS | TYPE | JUSTIFICATION |
|---|---|---|---|---|---|
| 12 | 1 | Renewable energy | Appropriate uses of energy resources suitable for agricultural mechanization in developing countries: Solar, wind, water, biogas, etc. | 3 | Mechanization Institute is only three years old. Research staff need to be trained in the different areas of research to create a diverse staff. Staff need training in types of machines that are newly adapted or can be adapted to this country. There needs to be expertise in design and development in the Institute. The major goals are to develop local manufacturing of agricultural machinery and equipment. Emphasis has been built around the research discipline in the Institute. |
| 12 | 2 | Agricultural mechanization system evaluation | Economic and socio-economics of different agricultural mechanization management systems evaluation for certain strategic crops | 1/2 | |
| 12 | 3 | Mechanical power | Design and development of machinery components suitable for agricultural mechanization. | 1/2 | |
| 12 | 4 | Farm machinery | Design and development of types of farm machinery for harvesting systems | 1/2 | |
| 12 | 5 | Agro-industrial mechanization evaluation | Evaluation of development of agro-industrial sytems and its impact on Egyptian Economy | 1/2 | |
| 12 | 6 | Agricultural mechanizati post harvest | Mechanization of handling, transportation, grading, packing and storage of certain export crops | 3 | When training is specified in type 3, it is because these fields are not adequately taught in Egypt. |
| 12 | 7 | Machinery prototype development | Prototype development and design to increase yields and save labor | 3 | |
| 12 | 8 | Machinery testing | Procedures and methods to test equipment and machinery under changing environmental conditions | 3 | |
| 12 | 9 | Agricultural Process Engineering | Drying, storage and processing of major domestic food crops from engineering point of view | | |
| 13 | 1 | Systems evaluation | Evaluation of agricultural projects | 1/2 | Institute lacks staff trained in this field. |
| 13 | 2 | Agricultural Marketing | - Improving domestic marketing of agricultural crops<br>- Marketing of animal products<br>- Developing of marketing infrstructures | 1/2 | Need qualified specialists to lead research to improve marketing structure and performance of the marketing system. Marketing is a strategic element because losses in kind and quality are encountered in different channels. |
| 13 | 3 | Price policy implementation | Policies of cropping patterns | 1/2 | Institute lacks staff trained in this field. |



262

## ACADEMIC TRAINING - PHD DEGREES

| [illegible] | [illegible] | FIELD OF STUDY | MAJOR EMPHASIS | TYPE | JUSTIFICATION |
|---|---|---|---|---|---|
| 14 | 1 | Family management and nutrition | Home economics subjects with empahsis on nutrition information, education and development of rural women | 1/2 | In this Institute staff need new training in management of technology transfer. They must learn the new methods and systems of discerning needs, collection and dissemination of new technology to the farmer and transfer of farmer knowledge back to the researcher. |
| 14 | 2 | Rural community organization | Rural development, structure, leadership and organization | 1/2 | |
| 14 | 3 | Technology transfer | Extension education and programming | 1/2 | |
| 15 | 1 | Pesticide resistance | Monitoring and determining pesticide residues in various biological media | 1/2 | Lack of institute trained staff in this area: Resistance phenomenon is the most biological limitation for successful pest control. Efforts must be directed towards delaying tho occurence of resistance. Need staff able to identify biochemical defense mechanisms in resistant strains. |
| 15 | 2 | Pesticide residue amelioration | Study of new control means for minimizing resistance in cotton bollworm to insecticides. | 1/2 | Lack of institute trained staff in this area: Need a residue analyst trained to determine the persistence of pesticide residues in different crops and recomend the safety periods (pre-harvest intervals) from application to harvest time. |
| 16 | 1 | Biological evaluation of feed | Production of non-traditional protein concentrates for chick feed including biological evaluation of the products | 1/2 | This laboratory is a newly established laboratory and staff are not currently available. One of its functions is to analyze protein and feedstuff for certification of imported feed. Local feed must be certified. |
| 16 | 2 | Food microbiology | Production of single cell protein using farm waste and verifying the safety of food | 1/2 | |
| 17 | 1 | Applied Statistics in Agricultural Production | - Method of statistical experimentation<br>- Data collection and analysis of results<br>- Experimental design for crop production | 1/2 | Lack of trained staff in this area |
| 17 | 2 | Applied Statistics in Crop Breeding | - Method of statistical experimentation<br>- Data collection and analysis of results<br>- Experimental design for crop breeding<br>- Statistics in population genetics. | 1/2 | Lack of trained staff in this area |

## ACADEMIC TRAINING - PHD DEGREES

| HUS | NO | FIELD OF STUDY | MAJOR EMPHASIS | TYPE | JUSTIFICATION |
|---|---|---|---|---|---|
| 20 | 1 | Horticulture | Horticulture major, extension minor with emphasis on on-farm research/extension interdisciplinary approach | 1/2 | There is a lack of trained staff in developing and using the interdisciplinary approach to technology transfer. On-farm trials are critical in providing farmers with new information and providing feed-back to researchers. |
| 20 | 2 | Animal production | Animal production major, extension minor with emphasis on on-farm research/extension interdisciplinary approach | 1/2 | |
| 20 | 3 | Extension | Extension major with emphasis on rural and community orginization and development | 1/2 | |
| 20 | 4 | Agricultural economics | Agricultural economics major, rural sociology minor | 1/2 | |
| 24 | 1 | Public Administration | Organizational Development | 1/2 | Management training and development activities are important elements of NARP but there is lack of trained staff in this area. Trained staff are needed |
| 24 | 2 | Public Administration | Training and resource development | 3 | |
| 24 | 3 | Public Administration | Financial analysis and organizational planning | 1/2 | |

# POSTDOCTORAL TRAINING

| INSTITUTE | # TRAINEES | FIELD OF STUDY |
|---|---|---|
| 1 | 5 | Agronomy |
| 1 | 5 | Cereal Breeding |
| 1 | 1 | Cereal Technology |
| 1 | 1 | Crop Management |
| 1 | 1 | Fiber Crops Production |
| 1 | 1 | Field Crops Physiology |
| 1 | 1 | Forage Production |
| 1 | 1 | Metereological Studies |
| 1 | 1 | Oil Crops Production |
| 1 | 1 | Onion Breeding |
| 1 | 1 | Rice Production |
| 1 | 3 | Stress Breeding |
| 1 | 2 | Stress Physiology |
| 1 | 1 | Breeding for Insect Resistance |
| 2 | 1 | Fiber Crops Breeding |
| 2 | 1 | Fiber Crops Physiology |
| 2 | 1 | Fiber Crops Technology |
| 2 | 1 | Fiber Crops Maintenance and Seed Production |
| 2 | 1 | Fiber Crops Agronomy |
| 2 | 1 | Fiber Crops Cotton Germplasm |
| 2 | 1 | Fiber Crops Mechanical Picking |
| 2 | 1 | Fiber Crops Ginning and Seed Processing |
| 3 | 1 | Sugar Cane Breeding |
| 3 | 1 | Sugar Beet Agronomy and Production |
| 3 | 1 | Technology and Processing Syrup of Sweet Sorghum |
| 3 | 1 | Sugar Cane Agronomy and Production |
| 3 | 1 | Sugar Beet Breeding |
| 3 | 1 | Sweet Sorghum Breeding |
| 3 | 1 | Sugar Cane Diseases |
| 3 | 1 | Pathology and Entomology of Sugar Beets |
| 3 | 1 | Physiology of Flowering of Sugar Cane and Seed Setting |
| 3 | 1 | Physiology of Flowering of Sugar Beets |
| 4 | 1 | Banana Agronomy |
| 4 | 1 | Modern Technology of Aromatic Plants & Extraction of Oil |
| 4 | 1 | New Methods of Fertilization & Propagation in Citrus |
| 4 | 1 | Post Harvest Physiology of Fruits & Vegetables |
| 4 | 1 | Utilization of By-Products & Wastes of Fruits & Vegetables |
| 4 | 1 | Meat and Fish Processing |
| 4 | 1 | Plasticulture of Horticulture Crops |
| 4 | 1 | Storage & Packaging |
| 4 | 1 | Propagation Technique of Deciduous Fruits |
| 4 | 1 | Fruits under Stress Condition |
| 4 | 1 | Agronomy of Mango Trees |
| 4 | 1 | Agronomy of Palm Date Trees |
| 4 | 1 | Integrated Pest Management in Fruit Trees |
| 4 | 1 | Vegetable Seed Production |
| 4 | 1 | New Technology of Oils and Fats |
| 4 | 1 | New Technology of Food Preservation |

# POSTDOCTORAL TRAINING

| INSTITUTE | # TRAINEES | FIELD OF STUDY |
|---|---|---|
| 4 | 1 | Indoor Plants Production |
| 4 | 1 | New Systems for Training Grape Vines |
| 4 | 1 | Wind Breaks and Shelterbelts |
| 4 | 1 | Post Harvest and Handling of Ornamental Plants |
| 5 | 1 | Computer Programming Analysis in Relation to Animal Breeding |
| 5 | 1 | Dairy Technology |
| 5 | 1 | Poultry Feed Technology in Formation of Least Cost Rations |
| 5 | 1 | Dairy Chemistry |
| 5 | 1 | Dairy Husbandry in Large & Small Units |
| 5 | 1 | Sheep and Goat Production Under Intensive Systems |
| 5 | 1 | Poultry Husbandry |
| 5 | 1 | Feed Lot Operations & Complete Rations in Cattle Feeding |
| 5 | 1 | Rabbit Husbandry |
| 5 | 1 | Dairy Microbiology |
| 5 | 1 | Integrated Farm Management |
| 5 | 1 | Physiological Adaptation of Animals to Hot & Dry Conditions |
| 6 | 1 | Deficiency and Metabolic Diseases |
| 6 | 1 | Food Control |
| 6 | 1 | Mycotic Diseases |
| 6 | 1 | Pathology of Bovine Diseases |
| 6 | 1 | Serological Diagnosis of Blood Parasites |
| 6 | 1 | Diagnosis of Animal Virus Diseases |
| 6 | 1 | Diagnosis of Anaerobic Bacterial Sheep & Goat Diseases |
| 6 | 1 | Diagnosis of Viral Poultry Diseases |
| 9 | 1 | Field Drainage |
| 9 | 2 | Plant Nutrition |
| 9 | 2 | Remote Sensing and its Use in Agriculture |
| 9 | 1 | Plant - Salt Tolerance |
| 9 | 1 | Sand Dune Movement and Fixation |
| 9 | 2 | Biological N2-Fixation, Symbiotic and Non-Symbiotic |
| 9 | 1 | Soil Conditioners |
| 9 | 1 | Agro-climatology |
| 9 | 2 | Computer Models for Water Movement in Soil |
| 9 | 2 | Computer Models for Ion Movements in Soil |
| 9 | 1 | Control of Insects by Micro-organisms |
| 9 | 1 | Biogas Technology |
| 9 | 2 | Biological N2-Fixation - Genetic Engineering |
| 9 | 1 | Soil and Plant Polution with Pesticides, Fertilizers, etc. |
| 9 | 1 | Soil Conservation |
| 9 | 1 | Water Harvesting |
| 9 | 1 | Irrigation Techniques: Sprinkler, Drip, etc. |
| 9 | 1 | Plant Tissue Test as a Tool for Plant Requirements to Nutrients |
| 9 | 1 | Soil Mechanics in Relation to Crop Production |
| 10 | 1 | Disease Forecast for Rice Blast |
| 10 | 1 | Disease Forecast for Potato Blight |
| 10 | 1 | Disease Forecast for Rusts |
| 10 | 2 | Disease Forecast for Fruit Disease |
| 10 | 1 | Disease Loss Assessment |

266

# POSTDOCTORAL TRAINING

| INSTITUTE | # TRAINEES | FIELD OF STUDY |
|---|---|---|
| 10 | 1 | IPM Programs |
| 10 | 1 | Rapid Detection of Plant Pathogens in the Field (Virus, Nematodes) |
| 10 | 1 | Modern Methods for Production of Virus-Free Material |
| 10 | 1 | Post-Harvest Pathology (Modified Atmosphere, Mycotoxins) |
| 10 | 2 | Fruit Diseases (Citrus, Grapes, Pears) |
| 10 | 1 | Oil Crops (Sesame, Sunflower, Peanuts, Flax) |
| 10 | 1 | Cucurbit Diseases |
| 10 | 1 | Soil-borne Diseases |
| 10 | 1 | Fungal Taxonomy and Fungal Collection |
| 11 | 1 | Crop Loss Assessments Due to Major Economic Pests |
| 11 | 1 | Integrated Pest Management |
| 11 | 1 | Insect Sex Attractants |
| 11 | 1 | Forecasting Insect Infestation |
| 11 | 1 | Insect Microbial Control |
| 11 | 1 | Weed Survey and Control |
| 11 | 1 | Rodents Ecology and Control |
| 11 | 1 | Termites Ecology and Control |
| 11 | 1 | Aerial Spraying Technique |
| 11 | 1 | Insect Rearing Methods |
| 11 | 1 | Rearing Parasites and Predators |
| 11 | 1 | Insect Transmitting Virus |
| 11 | 1 | Insect Taxonomy |
| 11 | 1 | Agroclimatology and Insect Infestation |
| 11 | 1 | Wood Borers Control |
| 11 | 1 | Experimental Designs for Testing Pesticides |
| 11 | 1 | Population Dynamic Studies |
| 11 | 1 | Horticulture Pests |
| 12 | 1 | Machinery Adaptation |
| 12 | 1 | Machinery Testing |
| 12 | 1 | Mechanization Systems |
| 12 | 1 | Irrigation Technology |
| 13 | 1 | Assessment of Sampling Techniques |
| 13 | 1 | Economics of Protected Agriculture |
| 13 | 1 | Feasibility Studies |
| 13 | 1 | Land Economics |
| 13 | 1 | Price Analysis |
| 13 | 1 | International Marketing |
| 13 | 1 | Resources of Production Economics |
| 13 | 1 | Means of Mobilizing Local Resources for Improving Rural Welfare |
| 13 | 1 | Monitoring of Agricultural Projects |
| 13 | 1 | Improving the Current System of Census Statistics |
| 14 | 1 | Socio Cultural Aspects of Environmental Pollution in Rural Communities |
| 14 | 1 | Diffusion, Adoption, Rejection and Planning for Agricultural Innovations |
| 14 | 1 | Organization and Management of Agricultural Extension Systems |
| 14 | 1 | Communications and Media Strategies for Agriculture and Rural Dev. |
| 15 | 1 | Integrated Pest Management (IPM) |
| 15 | 1 | Toxicology |
| 16 | 1 | Biological Evaluation of Toxicity in Food and Feed |

# POSTDOCTORAL TRAINING

| INSTITUTE | # TRAINEES | FIELD OF STUDY |
|---|---|---|
| 16 | 1 | Processing of Soybean for Food and Feed |
| 16 | 1 | Production of Single Cell Proteins for Poultry Feed |
| 16 | 1 | Food Microbiology |
| 17 | 1 | Design and Statistical Analysis |
| 17 | 1 | Computer System Training |
| 19 | 1 | Planning and Statistics of Seed Production |
| 19 | 1 | Seed Diseases |
| 19 | 1 | Seed Testing |
| 19 | 1 | Seed Processing |
| 19 | 1 | Seed Quality Control |
| 19 | 1 | Seed Production and Marketin |
| 20 | 1 | Farming Systems Approach to Hesearach and Extension for Small Farms |
| 20 | 1 | Management of Agricultural Research |
| 20 | 1 | Designing & Managing Integrated Agricultural & Rural Development Programs |
| 20 | 1 | Communication and Management Skills for Re-entry and Introducing Change |
| 20 | 1 | Integration of Women in Agricultural and Rural Development Programs |
| 21 | 1 | Germplasm Storage |
| 21 | 1 | Germplasm Storage |
| 21 | 1 | Germplasm Storage |
| 21 | 1 | Germplasm Storage |
| 21 | 1 | Germplasm Storage |
| 22 | 1 | Management |
| 22 | 1 | Accounting |
| 22 | 1 | Financial Administration |
| 23 | 1 | Information Transfer, Information Science and Technology |
| 23 | 1 | Computer & Information Science; Database and Network Systems Analysis |

## D. Training Implementation

Initially after NARP was approved trainees from previous projects were given approval to continue their academic training to complete their Ph.D. and Masters degrees under NARP funding. Thirty four trainees are currently in U.S. Universities in the aquaculture, field crops and mechanization areas.

English testing and training was started for staff at American University in Cairo and Alexandria in October, 1986 and will continue throughout the Project to prepare trainees for out of country training and to upgrade their english skills for professional improvement.

The NARP Manpower Development and Training Unit which is comprised of the Training Committee, assigned MOA staff and the Manpower Development and Training Advisor have compiled the necessary information included in this Master Training Plan. This Manpower Development and Training Unit will continue the steps necessary to implement the Plan.

Implementation procedures for out of country and in country training are outlined in Appendix H.

## E. Training Evaluation

Evaluation and monitoring of the manpower development and training of staff is a necessary management tool to help provide feedback information on the progress of the participants and to describe accomplishments within the organization. All stages of the Process must include evaluation and monitoring. It is important to continue to evaluate the needs of the individual and organization to establish priorities of the program. Records must be kept according to the numbers of participants being trained, their progress, and their evaluation of whether the program was timely and helped them in their work. The activities must be evaluated according to the efficiency, effectiveness and impact on the program.

Annual plans and reports must be made to describe the progress that is being made according to the plans, pin-point changes that are needed, identify the forthcoming activities and allocate resources.

Specific reports to USAID and GOE are contained in the Appendix H in the training implementation.

# APPENDIX A

## SUMMARY
## OF
## ASSESSMENT REPORT
## THE AGRICULTURAL RESEARCH ENVIRONMENT
## THE CASE OF EGYPTIAN PROVINCIAL UNIVERSITIES

BY

HATEM MOHAMED ALI, Ph.D.
MOHAMED DIA EL-DIN HASSANEIN ALI, Ph.D.
ABD EL-MOTALEB MOHAMED SHAABAN, Ph.D.

SUPPORTED BY

THE INTERNATIONAL DEVELOPMENT RESEARCH CENTRE (CANADA)

CAIRO

MAY 1985

## CONSTRAINTS AND OPPORTUNITIES[1]

The growth of university enrollment in Egypt has been the subject of intense public debate for decades. The heavy student enrollment at present is the result of a conscious policy decision on the part of the government. While as with any policy, the open admissions policy may some day be changed, there is no likelihood that it will be soon. Consequently, the system will continue to be strained in all resource bases for the forseeable future. In the effort to continue to expand the quantity of education, there is little reason to assume significant potential to increase the quality of the system as a whole. Nor is there likely to be resource availability for major expansions of the universities into other than the teaching function.

The staff of faculties of agriculture in Egyptian provincial universities were historically largely trained abroad. This is changing, and a considerable number of faculty members are now the product of undergraduate and graduate education in Egypt. It was suggested that very high priority should be given to broaden the educational experience of these professors through training abroad.

The capital investment necessary to increase the productivity of students and faculty is not adequate. Libraries, books, photocopying facilities, laboratory facilities, teaching aids and the other facilities that are requred for modern university productivity are in short supply. Moreover, the utilization of existing equipment is low for lack of strong administrative systems for equipment maintenance.

These factors have been the cause and effect at the same time of the scientific isolation or inadequate performance of those universities. It is manifested in the publication dates of references in research publications which are often five years or more behind those of U.S. or European colleagues. It shows in outdated lecture notes and curricula in the University faculties. It seems inescapable that is shows in the technologies that are studied and transferred through the University to the general society.

The students too find increasing difficulties in the process of learning. This is illustrated by the lack of adequate on-campus housing and having in most cases, to work in addition to carrying a heavy scholastic burden.

It must be acknowledged that the data concerning on-going research in the provincial faculties revealed a high degree of duplication and hence the need to establish proper information and communication systems.

1. Pages 108 & 10[illegible]

TABLE 47: The status of laboratory equipment in nine provincial facilities of agriculture

| Departments | Facilities | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | As | Fa | Ma | Me | Mf | Za | Ks | Ms | Sc |
| Agric. Chem | B | - | B | B+ | - | - | B | B | - |
| Agric. Econ. | C | C | C | C | C | C | C | C | C |
| Ext. & Rural Dev. | - | - | C | - | - | - | - | - | - |
| Agronomy | B | C | C | C | C | B+ | B+ | C | B |
| Animal Sci. | B+ | C | B | B | B | B | C | C | B |
| Dairy Sci. | B+ | C | B | B | B | B | C | C | B |
| Food Tech. | B+ | B | B+ | B | B | B | C | C | B |
| Genetics | B+ | - | B | C | C | B | C | C | - |
| Horticulture | B | B- | C | B+ | C | B+ | B | B- | B |
| Phytopathology | B+ | - | - | - | B | - | B | - | - |
| Plant Protection | B | B- | C | B | C | - | B | B+ | B |
| Soil Science | B | B- | B+ | B+ | B | B | B+ | B+ | B |
| Microbiology - | B- | B | B | - | - | - | - | - | - |
| Botany | - | - | B+ | B+ | B+ | B | B | C | C |
| Mechanization | - | - | A | - | - | - | - | - | - |

As = Assiut
Fa = Fayoum
Ma = Mansoura
Me = Menya
Mf = Menufiya
Za = Zagazig
Ks = Kafr El-Sheikh
Ms = Moushtohor
Sc = Suez Canal

- The assessed facilities were ranked as A to express well equipped, B to express moderately equipped having B- or B+ within the same rank and C to express under equipped facilities.

# APPENDIX B

## MINISTRY OF AGRICULTURE

## AGRICULTURAL TRAINING CENTERS AND FACILITIES

Appendix B

## MINISTRY OF AGRICULTURE
## AGRICULTURAL TRAINING CENTERS AND FACILITIES

| Center | Activity | Governorates | Directors' Name | Liaison Officers | Capacity |
|---|---|---|---|---|---|
| Sakha Training Center | Multi-purpose | Damietta - Gharbiya Beheira - Dakahliya Alexandria - Marsa Matrouh Kalr El-Sheikh | Eng. Sameeh Osman Abdel Ghaffar | Mr. Ahmed Zahraan Mr. Mohamed Hussein | (100) Full Board |
| Sids Training Center | Multi-purpose | Minia - Fayoum - Beni-Suel | Eng. Mohamed Sami Kandil | Mr. Sayed Al-Showehy Mr. Sayed Gharib | (150) Full Board |
| Agricultural Management Development Center | Management & Administrative Affairs | All Governorates | Eng. Atef Abdel Halim | Mr. Ibrahim Youssuf Sidky | (53) Full Board |
| Ismaila Training Center | Multi-purpose | Ismailia - Suez - Port Said - Red Sea - North Sinai - South Sinai | Eng. Sayed Mohamed Aly | Mr. Mohamed Hassan Salim Mrs. Nabila Al-Tonsy | (30) Full Board |
| Mamot | Multi-purpose & Rural Development | Beheira - Alexandria - Marsa Matrouh | Mr. Mahmoud El-Mahdi | | (150) Trainees (75) Full Board |
| Belbeis Training Center | Multi-purpose | Sharkiya - Menoulia - Kalubiya | Eng. Abdel Aziz Al-Kashif | Mr. Fathy Al-Azhary Mrs. Samira Victor | (60) Full Board |
| Mansoura | Farm Machinery Training Center | All Governorates | Eng. Nabil Helmy | | (75) Full Board |
| Shandaweel Training Center | Multi-purpose | Assiut - Sohag - Quena - Luxor - Aswan - New Valley | Eng. Moneir Selim Wassif | Mr. Mohamed A. Khedr Mrs. Zeinab Hussein A. Abdullah | (65) Full Board |
| The Egyptian International Center for Agriculture | Multi-purpose | All Governorates | Direct supervision of the Central Administration for Adm. Develop. | Mr. Magdi M. Abdel Samad | Accommodates in Cairo at contracted hotels |
| Beni Suef | Craftsman | Beni Suef - Menia - Fayoum | Mrs. Samia Khalil | | (150) Trainees (30) Full Board |
| Horticulture Training Center | Horticulture | All Governorates | Eng. Hassan El-Rashidi | Mr. Ahmed Zahraan | (48) Full Board (60) Under Completion |

(Cont'd)



274

| Centers | Activity | Governorates | Directors' Name | Liaison Officers | Capacity |
|---|---|---|---|---|---|
| El Marg | Craftsman | Kalubiya - Sharkiya - Ismailia - Cairo | Mrs. Samira Khalil | | (160) Trainees<br>No accomdations |
| Central Training Center | Multi-purpose | A. Cairo<br>B. Giza | Eng. Mohamed Hassan | Mrs. Ferial H. Makhlof<br>Mr. Hossam Abdel Razik<br>Mr. Mohamed Amin Amir | Non-residential (Lecture rooms & training aids provided with facilties) |

APPENDIX C

## LIST OF RESEARCH UNITS

| Code Number | Name of Research Unit |
|---|---|
| 01 | Field Crops Institute |
| 02 | Cotton Institute |
| 03 | Sugar Institute |
| 04 | Horticulture Institute |
| 05 | Animal Production Institute |
| 06 | Animal Health Institute |
| 07 | Veterinary Serum & Vaccine Institute |
| 08 | Animal Reproduction Institute |
| 09 | Soils and Water Institute |
| 10 | Plant Pathology Institute |
| 11 | Plant Protection Institute |
| 12 | Agricultural Mechinization Institute |
| 13 | Agricultural Economics Institute |
| 14 | Extension and Rural Development |
| 15 | Central Agriculture Pesticides Laboratory |
| 16 | Central Laboratory for Food and Feed |
| 17 | Central Laboratory for Agricultural Statistics |
| 18 | Central Organization for Seeds |
| 19 | Breeder Seeds "State Farm" |
| 20 | On-Farm Trials Department |
| 21 | Research Stations (31) |
| 22 | Administrative Unit |
| 23 | Library and Information Services |
| 24 | Center for Management Development |

ARC - PROFESSIONAL RESEARCH STAFF BY ORGANIZATIONAL UNIT AND RANK

| Organizational Unit | Rank | | | | | Total Professional Staff |
|---|---|---|---|---|---|---|
| | Professor | Associate Professor | Researcher | Associate Researcher | Assistant Researcher | |
| Center Direction | | | | | | |
| Director | 1 | | | | | 1 |
| Deputy Director | 2 | | | | | 2 |
| Other Professional Staff | 0 | | | | | 0 |
| Total | 3 | 0 | 0 | 0 | 0 | 3 |
| Field Crops Research Institute | | | | | | |
| Director | 1 | | | | | 1 |
| Deputy Director | 2 | | | | | 2 |
| Other Professional Staff | 46 | 24 | 89 | 89 | 25 | 273 |
| Total | 49 | 24 | 89 | 89 | 25 | 276 |
| Plant Protection Research Inst | | | | | | |
| Director | 1 | | | | | 1 |
| Deputy Director | 1 | | | | | 1 |
| Other Professional Staff | 19 | 37 | 109 | 165 | 36 | 366 |
| Total | 21 | 37 | 109 | 165 | 36 | 368 |
| Cotton Research Institute | | | | | | |
| Director | 1 | | | | | 1 |
| Deputy Director | 2 | | | | | 2 |
| Other Professional Staff | 21 | 31 | 46 | 53 | 8 | 159 |
| Total | 24 | 31 | 46 | 53 | 8 | 162 |
| Plant Pathology Research Inst | | | | | | |
| Director | 1 | | | | | 1 |
| Deputy Director | 2 | | | | | 2 |
| Other Professional Staff | 21 | 32 | 68 | 71 | 23 | 215 |
| Total | 24 | 32 | 68 | 71 | 23 | 218 |
| Horticulture Research Institute | | | | | | |
| Director | 1 | | | | | 1 |
| Deputy Director | 3 | | | | | 3 |
| Other Professional Staff | 25 | 31 | 98 | 154 | 34 | 342 |
| Total | 29 | 31 | 98 | 154 | 34 | 346 |
| Agricultural Economics Institute | | | | | | |
| Director | 1 | | | | | 1 |
| Deputy Director | 2 | | | | | 2 |
| Other Professional Staff | 2 | 9 | 20 | 78 | 24 | 133 |
| Total | 5 | 9 | 20 | 78 | 24 | 136 |
| [illegible] Research Institute | | | | | | |
| Director | 1 | | | | | 1 |
| [illegible] | 1 | | | | | 1 |
| [illegible] Staff | 0 | 1 | 10 | 23 | 11 | 45 |
| [illegible] | 2 | 1 | 10 | 23 | 11 | 47 |

ARC - PROFESSIONAL RESEARCH STAFF BY ORGANIZATIONAL UNIT AND RANK

| Organizational Unit | Rank | | | | | Total Professional Staff |
|---|---|---|---|---|---|---|
| | Professor | Associate Professor | Researcher | Associate Researcher | Assistant Researcher | |
| **Serum and Vaccines Research** | | | | | | |
| Director | 1 | | | | | 1 |
| Deputy Director | 2 | | | | | 2 |
| Other Professional Staff | 14 | 6 | 25 | 17 | 10 | 72 |
| Total | 17 | 6 | 25 | 17 | 10 | 75 |
| **Soils and Water Research Inst.** | | | | | | |
| Director | 1 | | | | | 1 |
| Deputy Director | 2 | | | | | 2 |
| Other Professional Staff | 39 | 51 | 101 | 134 | 40 | 365 |
| Total | 42 | 51 | 101 | 134 | 40 | 368 |
| **Animal Health Research** | | | | | | |
| Director | 1 | | | | | 1 |
| Deputy Director | 2 | | | | | 2 |
| Other Professional Staff | 15 | 20 | 59 | 60 | 25 | 179 |
| Total | 18 | 20 | 59 | 60 | 25 | 182 |
| **Sugar Crops Research Institute** | | | | | | |
| Director | 1 | | | | | 1 |
| Deputy Director | 2 | | | | | 2 |
| Other Professional Staff | 5 | 4 | 5 | 10 | 6 | 30 |
| Total | 8 | 4 | 5 | 10 | 6 | 41 |
| **Central Pesticides Laboratory** | | | | | | |
| Director | 1 | | | | | 1 |
| Deputy Director | 1 | | | | | 1 |
| Other Professional Staff | 7 | 13 | 29 | 28 | 4 | 81 |
| Total | 9 | 13 | 29 | 28 | 4 | 83 |
| **Animal Reproduction Research** | | | | | | |
| Director | 1 | | | | | 1 |
| Deputy Director | 1 | | | | | 1 |
| Other Professional Staff | 3 | 4 | 7 | 9 | 6 | 29 |
| Total | 5 | 4 | 7 | 9 | 6 | 31 |
| **Agricultural Mechanization Inst.** | | | | | | |
| Director | 1 | | | | | 1 |
| Deputy Director | 1 | | | | | 1 |
| Other Professional Staff | | | | 4 | 16 | 20 |
| Total | 2 | 0 | 0 | 4 | 16 | 22 |
| **Animal Production Institute** | | | | | | |
| Director | 1 | | | | | 1 |
| Deputy Director | 2 | | | | | 2 |
| Other Professional Staff | 14 | 13 | 58 | 75 | 21 | 181 |
| Total | 17 | 13 | 58 | 75 | 21 | 184 |

ARC - PROFESSIONAL RESEARCH STAFF BY ORGANIZATIONAL UNIT AND RANK

| Organizational Unit | Rank | | | | | Total Professional Staff |
|---|---|---|---|---|---|---|
| | Professor | Associate Professor | Researcher | Associate Researcher | Assistant Researcher | |
| Central Lab for Food & Feed | | | | | | |
| Director | 1 | | | | | 1 |
| Deputy Director | | | | | | 0 |
| Other Professional Staff | 1 | | | | | 1 |
| Total | 2 | 0 | 0 | 0 | 0 | 2 |
| Central Statistics Laboratory | | | | | | |
| Director | 1 | | | | | 1 |
| Deputy Director | 1 | | | | | 1 |
| Other Professional Staff | 0 | | 0 | 22 | 10 | 40 |
| Total | 2 | 0 | 0 | 22 | 10 | 42 |
| Grand Total | 279 | 276 | 735 | 1,000 | 302 | 2,592 |

*Seconded by Ain Shams University
Prepared January, 1987

Appendix E.

# IN-COUNTRY FIVE YEAR TRAINING PLANS AS REQUESTED BY RESEARCH UNITS

Appendix E contains the estimated training that has been requested by the various institutes, departments and laboratories. The information on the following charts gives the number of the training and field of training requested by each institute. The numbers of the research units are as follows:

1. Field Crops Institute
2. Fiber Crops Institute
3. Sugar Institute
4. Horticulture Institute
5. Animal Production Institute
6. Animal Health Institute
7. Veterinary Serum & Vaccine Institute
8. Animal Reproduction Institute
9. Soils and Water Institute
10. Plan Pathology Institute
11. Plant Protection Institute
12. Agricultural Mechanization Institute
13. Agricultural Economics Institute
14. Extension and Rural Development
15. Central Agriculture Pesticides Laboratory
16. Central Laboratory for Food and Feed
17. Central Laboratory for Agricultural Statistics
18. Central Organization for Seeds
19. Breeder Seeds "State Farm"
20. On-Farm Trials Department
21. Research Stations (31)
22. Administrative Unit
23. Library and Information Services
24. Center for Agricultural Management Development
25. Non-ARC

Appendix E

## IN-COUNTRY FIVE YEAR TRAINING PLANS

| | Field of Training | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Executive Management | 36 | 25 | 5 | 35 | 15 | 15 | 8 | 10 | 20 | 17 | 15 | 3 | 3 | 2 | 1 | 1 | 3 | 3 | | 25 | 8 | 35 | 10 | | |
| 2 | Advanced Management | 68 | 30 | 5 | 30 | 15 | 10 | 2 | 5 | 20 | 16 | 44 | 3 | 5 | 2 | 1 | | 4 | 10 | | 50 | 20 | 100 | 30 | | |
| 3 | Financial Mgmt for Researchers | 68 | 30 | 5 | 30 | 15 | 10 | 2 | 5 | 20 | 16 | 44 | 3 | 5 | 2 | 1 | | 4 | 10 | | 50 | 20 | | 30 | | |
| 4 | Mgmt - Project Cycling | 68 | 30 | 5 | 30 | 15 | 10 | 2 | 5 | 20 | 16 | 44 | 3 | 5 | 2 | 1 | | 4 | 10 | | 50 | 20 | | 30 | | |
| 5 | Communication Management | 68 | 30 | 5 | 30 | 15 | 10 | 2 | 5 | 20 | 16 | 44 | 3 | 15 | 2 | 1 | | 4 | 10 | | 50 | 20 | | 30 | | |
| 6 | Basic Management | 140 | 80 | 10 | 100 | 40 | 30 | 74 | 10 | 40 | 46 | 63 | 8 | 15 | 10 | 3 | | 8 | 20 | | 150 | 2 | 100 | 40 | | |
| 7 | New Employee Orientation | 33 | 60 | | 30 | | 30 | | 100 | | 15 | 75 | 25 | | 50 | | | | | | | | | | | 12500 |
| 8 | Feasibility & Proj Eval Studies | 66 | 30 | 6 | 150 | 50 | 35 | | 10 | 20 | 30 | 55 | 5 | 12 | 5 | | | | | | | 6 | | | | |
| 9 | Research Planning | 57 | 30 | 6 | 150 | 30 | 30 | 15 | 10 | 20 | 20 | 55 | 5 | 10 | 10 | | | | | | 30 | 6 | | | | |
| 10 | Research Management | 91 | 25 | 6 | 300 | 30 | 15 | 20 | 20 | 20 | 20 | 55 | 30 | 20 | 20 | | | | | | 30 | 10 | | | | |
| 11 | Research Design | 100 | 30 | 8 | 300 | 50 | 10 | 19 | 20 | 60 | 40 | 44 | 20 | 20 | 20 | | | 5 | | | 30 | 10 | | | | |
| 12 | Experimental Design & Plan. | 151 | 40 | 24 | 270 | 100 | 40 | 40 | 40 | 120 | 60 | 145 | 80 | 30 | | | | 10 | | | 30 | 60 | | | | |
| 13 | Research Lab Training (Gen) | 65 | | | 30 | 20 | 30 | 2 | | 10 | 16 | 20 | 5 | | | 2 | | | | | | 15 | | | | |
| 14 | Research Lab Train-Specialized | 75 | 30 | | 30 | 20 | 30 | 1 | | 10 | 16 | 37 | 5 | | | | 10 | | | | | 15 | | | | |
| 15 | Equip Repair for Lab Tech | 59 | 16 | | 10 | 5 | 10 | | | 5 | | 12 | 5 | | | | | | | | | 15 | | | 5 | |
| 16 | Computer Usage- Beginning | 35 | 10 | | 100 | 40 | 20 | 9 | 10 | 60 | 5 | 3 | 120 | 25 | 25 | 8 | 2 | | 25 | | | 155 | 50 | 100 | 15 | |
| 17 | Computer Usage - Advanced | 35 | 10 | | 100 | 40 | 20 | 9 | 10 | 60 | 5 | 3 | 120 | 20 | 15 | 3 | 2 | | 25 | | | 155 | | 100 | 15 | |
| 18 | Computer-Word Processing | 30 | 10 | 2 | 50 | 20 | 10 | 4 | 5 | 50 | 3 | 50 | 5 | 5 | 5 | 1 | 1 | 5 | 20 | | 10 | 30 | 50 | 100 | | |
| 19 | Computer-Software | 30 | 10 | 2 | 50 | 20 | 10 | 4 | 5 | 50 | 3 | 50 | 5 | 5 | 5 | 1 | 1 | 5 | 10 | | 10 | 30 | | 100 | | |
| 20 | Computer Analysis and Data Systems Design | 71 | 2 | | 100 | 40 | 10 | 9 | 10 | | 5 | 10 | 120 | 20 | 5 | 3 | 2 | - | 5 | | | 35 | 5 | 100 | 15 | |
| 21 | Computer Modeling | | | | 5 | | | | | | | 10 | | | | | | | | | | | | | | |
| 22 | Microcomputer & Telecommunication | 10 | 5 | 1 | 20 | 10 | 5 | 2 | 4 | 20 | 1 | 20 | 5 | 5 | 5 | 1 | 1 | 5 | | | 5 | 30 | | 100 | | |
| 23 | Computer Equip-Basic Maint | | | | | | | | | | | | | | | | | | | | | | | 50 | | |
| 24 | Evaluate English & Arabic | 34 | 12 | | 30 | 10 | 20 | | 10 | 10 | 6 | 50 | 15 | 20 | 8 | - | - | - | 5 | | | 20 | 100 | | 10 | |
| 25 | English Language Training-Adv | 86 | 25 | | 50 | 50 | 25 | 12 | 10 | 35 | 10 | 100 | 60 | 15 | 35 | 3 | | | 45 | | 50 | 10 | 50 | 100 | 5 | |
| 26 | English Language Training-Int | 172 | 50 | | 100 | 100 | 50 | 24 | 15 | 70 | 20 | 200 | 120 | 30 | 75 | 3 | | | 90 | | 100 | 20 | 100 | 200 | 5 | |
| 27 | English Language Training-Bed | 172 | 50 | | 100 | 100 | 50 | 24 | 15 | 70 | 20 | 200 | 120 | 30 | 75 | 3 | | | 90 | | 100 | 20 | | 200 | 5 | |
| 28 | Reading Literature Review | 172 | 50 | | 100 | 100 | 50 | 24 | 15 | 70 | 20 | 200 | 120 | 30 | 75 | 3 | | | 30 | | 100 | 20 | | 200 | 5 | |
| 29 | English-Technical Reading Int. | 172 | 50 | | 100 | 100 | 50 | 24 | 15 | 70 | 20 | 200 | 120 | 30 | 75 | 3 | | | 30 | | 100 | 20 | 5 | 200 | 5 | |
| 30 | English-Technical Writing Adv | 172 | 50 | | 100 | 100 | 50 | 24 | 15 | 70 | 20 | 200 | 120 | 30 | 75 | 3 | | | 30 | | 100 | 20 | 5 | 100 | 5 | |
| 31 | English Translation | | | | | | | | | | | | | | | | | | | | | | | 100 | | |

Appendix E

## IN-COUNTRY FIVE YEAR TRAINING PLANS

| | Field of Training | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 32 | Reading and Writing Arabic | 48 | | | | | 50 | | | 20 | 100 | | | | | | | | | | | | | | | |
| 33 | French Language Training | | | | 5 | | | | | 60 | | | | | | | | | | | | | | | | |
| 34 | Library (O & M) Procedures | 12 | 2 | | 5 | 2 | 30 | | 10 | 3 | 2 | 5 | 5 | 3 | 2 | | 1 | | | | | 15 | | 200 | 3 | |
| 35 | Accounting | 13 | 6 | | 20 | 5 | 20 | | 20 | 5 | 3 | 30 | 10 | 6 | 3 | | 2 | | | | | | 390 | | 2 | |
| 36 | Office Financial Management | 14 | 6 | | 20 | 5 | 10 | | 10 | 5 | 3 | 15 | 5 | 2 | 3 | | 2 | | | | | 10 | 300 | | 3 | |
| 37 | Purchasing & Inventory-Beg | 21 | 7 | | 20 | 5 | 30 | | 10 | 5 | 2 | 15 | 5 | 3 | 6 | | 1 | | | | | 20 | 200 | | 4 | |
| 38 | Purchasing & Inventory-Adv | 21 | 2 | | 20 | 5 | 30 | | 20 | 5 | 2 | 15 | 5 | 1 | 4 | | 1 | | | | | 20 | 100 | | 4 | |
| 39 | Personnel Management-Basic | 21 | 10 | | 20 | 5 | 20 | | 10 | 5 | 5 | 30 | 10 | 3 | 5 | | 1 | | | | | 20 | 300 | | 2 | |
| 40 | Personnel Management-Adv | | | | | | | | | | | | | | | | | | | | | | 300 | | | |
| 41 | Secretarial | 28 | 5 | | 20 | 10 | 20 | | 5 | 5 | 3 | 30 | 15 | 5 | 4 | | 2 | | | | | 20 | 200 | | 5 | |
| 42 | Typing | 44 | 2 | | 20 | 10 | 10 | | 10 | 5 | 2 | 10 | 3 | 2 | 4 | | 1 | | | | | 20 | 100 | | 8 | |
| 43 | Financial Management-Salaries | 21 | 6 | | 10 | 10 | 10 | | 10 | 5 | 2 | 5 | 5 | 2 | 5 | | 1 | | | | | 20 | | | 5 | |
| 44 | Mechanical - Advanced | 11 | 2 | | 1 | | 5 | | | 20 | | 3 | 375 | | | | | | | | | 15 | | | | |
| 45 | Mechanical - Middle | 11 | 2 | | 1 | | 5 | | | 20 | | 3 | 150 | | | | | | | | | | | | | |
| 46 | Mechanical - Beginning | 18 | 2 | | 1 | | 5 | | | 20 | | 3 | 150 | | | | | | | | | | | | | |
| 47 | Welding | 10 | 2 | | | | 2 | | | | | 1 | 245 | | | | | | | | | | | | | |
| 48 | Carpentry | | | | | | | | | | | 10 | | | | | | | | | | 155 | | | | |
| 49 | Water Well Pump (O&M) | 8 | | | 6 | | | | | 5 | | | 525 | | | | | | | | | 10 | | | | |
| 50 | Farm Machinery (O & M) | 30 | | | 20 | | | | | | | 5 | 525 | | | | | | | | | 15 | | | | |
| 51 | Combine (O & M) | 12 | | | | | | | | | | | 375 | | | | | | | | | 10 | | | | |
| 52 | Canal Dredging Mach (O & M) | 11 | | | | | 2 | | | | | | 525 | | | | | | | | | 5 | | | | |
| 53 | Laser Leveling Equip (O & M) | 2 | | | | | | | | | | | 375 | | | | | | | | | 5 | | | | |
| 54 | Metal Lathes (O & M) | 8 | 2 | | 2 | | 1 | | | | | 1 | 125 | | | 1 | | | | | | | | | | |
| 55 | Operation of Rice Planting Machines | 150 | | | | | | | | | | | 675 | | | | 1 | | | | | | | | | |
| 56 | Operation of Farm Machinery | 20 | | | | | | | | | | | 525 | | | | | | | | | | | | | |
| 57 | Driver Training (Cars) | 55 | | | 5 | | 5 | | 10 | 10 | 10 | 6 | 50 | | 4 | | | | | | | | | | | |
| 58 | Numerical Statistics | | | | | | | | | | | | | 10 | | | | | | | | 20 | | | | |
| 59 | Qualitative Statistics | | | | | | | | | | | | | 8 | | | | | | | | 20 | | | | |
| 60 | Farm Management Extension | 520 | | | | | | | | | | 220 | | | 500 | | | | | | | | | | | |
| 61 | Farm Water Specialist | 120 | 3 | | 10 | 100 | | | | | | 450 | | | 500 | 2 | | | | | | | | | | |
| 62 | Animal Husbandry Extension | | | | | | 20 | | | | | | | | | | | | | | | | | | | |
| 63 | Animal Husbandry Vet Extension | | | | | | 10 | | | | | | | | | | | | | | | | | | | |

## IN-COUNTRY FIVE YEAR TRAINING PLANS

| # | Field of Training | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [illegible] | [illegible]-Animal Breeding | | | | | | 10 | | | | | | | | | | | | | | | | | | | |
| [illegible] | Animal Products Treatment | | | | | 30 | | | | | | | | | | | | | | | | | | | | |
| 66 | Artificial Insemination | | | | | 50 | | | | | | | | | | | | | | | | | | | | |
| [illegible] | [illegible] Machines (O&M) | | | | | 20 | | | | | | | | | | | | | | | | | | | | |
| [illegible] | [illegible] Feed Prod. & Mgmt | | | | | 20 | | | | | | | | | | | | | | | | | | | | |
| 69 | [illegible] Breeding & Production | | | | | 50 | | | | | | | | | | | | | | | | | | | | |
| 70 | Dairy Quality Control | | | | | 50 | | | | | | | | | | | | | | | | | | | | |
| 71 | Milk By Products Production | | | | | 50 | | | | | | | | | | | | | | | | | | | | |
| 72 | Industrialization of Dairy Tech | | | | | 50 | | | | | | | | | | | | | | | | | | | | |
| 73 | [illegible] Production Intensification | | | | | 50 | | | | | | | | | | | | | | | | | | | | |
| 74 | Sheep & Goat Production | | | | | 50 | | | | | | | | | | | | | | | | | | | | |
| 75 | Sheep & Goat Nutrition Mgmt | | | | | 30 | | | | | | | | | | | | | | | | | | | | |
| 76 | Use of Isotopes | | | | | 5 | | | | | | | | | | | | | | | | | | | | |
| 77 | Hormonal Analysis | | | | | 5 | | | | | | | | | | | | | | | | | | | | |
| 78 | Chemology | | | | | 10 | | | | | | | | | | | | | | | | | | | | |
| 79 | Sheep & Goat Physiology & Reproduction | | | | | 10 | | | | | | | | | | | | | | | | | | | | |
| 80 | Statistical Analyses Animal Breeding | | | | | 30 | | | | | | | | | | | | | | | | | | | | |
| 81 | Animal Feed Technology | | | | | 5 | | | | | | | | | | | | | | | | | | | | |
| 82 | [illegible] Equipment (M&R) | | 2 | | | | | | | | | | | | | | | | | | | | | | | |
| 83 | [illegible] Balances (M&R) | | 2 | | | | | | | | | | | | | | | | | | | | | | | |
| 84 | [illegible] Equipment (M&R) | | 4 | | | | | | | | | | | | | | | | | | | | | | | |
| 85 | Weaving Machines | | 6 | | | | | | | | | | | | | | | | | | | | | | | |
| 86 | Sugar Cane Breeding | | | 12 | | | | | | | | | | | | | | | | | | | | | | |
| 87 | Sugar Beet Breeding | | | 12 | | | | | | | | | | | | | | | | | | | | | | |
| 88 | Sweet Corn Breeding | | | 12 | | | | | | | | | | | | | | | | | | | | | | |
| 89 | Sugar Cane Production | | | 15 | | | | | | | | | | | | | | | | | | | | | | |
| 90 | Beet Production | | | 15 | | | | | | | | | | | | | | | | | | | | | | |
| 91 | Sweet Corn Production | | | 15 | | | | | | | | | | | | | | | | | | | | | | |
| [illegible] | Quality Testing for Sugar Cane | | | 15 | | | | | | | | | | | | | | | | | | | | | | |
| 93 | Quality Testing for Sugar Beet | | | 10 | | | | | | | | | | | | | | | | | | | | | | |
| 94 | Quality Testing for Sweet Corn | | | 10 | | | | | | | | | | | | | | | | | | | | | | |

## IN-COUNTRY FIVE YEAR TRAINING PLANS

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [illegible] Training | | | | | | | | | | | | | | | | | | | | | | | | |
| [illegible] Diseases | | | 12 | | | | | | | | | | | | | | | | | | | | | |
| [illegible] Diseases | | | 12 | | | | | | | | | | | | | | | | | | | | | |
| [illegible] Pests | | | 12 | | | | | | | | | | | | | | | | | | | | | |
| [illegible] Pests | | | 12 | | | | | | | | | | | | | | | | | | | | | |
| [illegible] of Sugar Crops & Cereals Control | | | 12 | | | | | | | | | | | | | | | | | | | | | |
| [illegible] & Intercropping | | | 15 | | | | | | | | | | | | | | | | | | | | | |
| [illegible] of Sugar Industrialization | | | 15 | | | | | | | | | | | | | | | | | | | | | |
| New Systems of Irrigation for Horticultural Crops | | | | 10 | | | | | | | | | | | | | | | | | | | | |
| [illegible] Culture Techniques | | | | 10 | | | | | | | | | | | | | | | | | | | | |
| Crop Drying, Packing, Storage | | | | 30 | | | | | | | | | | | | | | | | | | | | |
| Drip Irrigation in Green Houses (OTM) | | | | 5 | | | | | | | | | | | | | | | | | | | | |
| Packing and Ventilation Units in Protective Houses (OTM) | | | | 5 | | | | | | | | | | | | | | | | | | | | |
| [illegible] | | | | 10 | | | | | | | | | | | | | | | | | | | | |
| [illegible] Gardens | | | | 100 | | | | | | | | | | | | | | | | | | | | |
| New [illegible] of Breeding & [illegible] Commercial Plants | | | | 10 | | | | | | | | | | | | | | | | | | | | |
| Pest Control | | | | 5 | | | | | | | | | | | | | | | | | | | | |
| [illegible] | | | | 5 | | | | | | | | | | | | | | | | | | | | |
| [illegible] | | | | 5 | | | | | | | | | | | | | | | | | | | | |
| [illegible] | | | | 10 | | | | | | | | | | | | | | | | | | | | |
| [illegible] Training Group | | | | 5 | | | | | | | | | | | | | | | | | | | | |
| [illegible] | | | | | | | | | | | | | | | | | | | | | | | | |
| [illegible] | | | | 10 | | | | | | | | | | | | | | | | | | | | |
| [illegible] | | | | | | | | | | | | | | | | | | | | | | | | |
| [illegible] | | | | 10 | | | | | | | | | | | | | | | | | | | | |
| [illegible] | | | | 5 | | | | | | | | | | | | | | | | | | | | |
| [illegible] | | | | 4 | | | | | | | | | | | | | | | | | | | | |
| [illegible] | | | | | | | | | | | | | | | | | | | | | | | | |
| [illegible] | | | | 4 | | | | | | | | | | | | | | | | | | | | |



282

Appendix E

## IN-COUNTRY FIVE YEAR TRAINING PLANS

| Type of Training | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [illegible] Research | | | | 4 | | | | | | | | | | | | | | | | | | | | | |
| [illegible] Techniques | | | | 10 | | | | | | | | | | | | | | | | | | | | | |
| [illegible] Mechanization | | | | 10 | | | | | | | | | | | | | | | | | | | | | |
| [illegible] of Greenhouse Tools | | | | 10 | | | | | | | | | | | | | | | | | | | | | |
| [illegible] Research | | | | | | | | | | | | | | | | | | | | | | | | | |
| [illegible] of Extension Work | | | | | | | | | | | | | 30 | | | | | | | | | | | | |
| [illegible] Translation | | | | | | | | | | | | | 30 | | | | | | | | | | | | |
| 25 Use & Maint of A/V Equip | | | | | | | | | | | | | | | | | | | | | | | 100 | | |
| Preservation of Library & | | | | | | | | | | | | | | | | | | | | | | | 400 | | |
| 29 Archival Materials | | | | | | | | | | | | | | | | | | | | | | | | | |
| 29 Information Technology | | | | | | | | | 10 | | | | | | | | | | | | | | 200 | | |
| 31 Reprographic/Copier Operation | | | | | | | | | | | | | | | | | | | | | | | 200 | | |
| 32 Use of Research Literature | | | | | | | | | | | | | | | | | | | | | | | 200 | | |
| Use of Filing Systems for | | | | | | | | | | | | | | | | | | | | | | | 50 | | |
| 33 Researchers | | | | | | | | | | | | | | | | | | | | | | | | | |
| 34 English in Libraries | | | | | | | | | | | | | | | | | | | | | | | 50 | | |
| 35 Library Public Service | | | | | | | | | | | | | | | | | | | | | | | 200 | | |
| Library Reference Sources & | | | | | | | | | | | | | | | | | | | | | | | 200 | | |
| 36 Services | | | | | | | | | | | | | | | | | | | | | | | | | |
| 37 Database Search Techniques | | | | | | | | | | | | | | | | | | | | | | | 100 | | |
| Management of Library | | | | | | | | | | | | | | | | | | | | | | | 30 | | |
| 38 Sources & Services | | | | | | | | | | | | | | | | | | | | | | | | | |
| Library & Information Center | | | | | | | | | | | | | | | | | | | | | | | 20 | | |
| 39 Management | | | | 5 | 10 | | | | | | | | | | | | | | | | | | | | |
| 40 Seed Law Implementation | | | | | | | | | | | | | | | | | | | | | 15 | | 60 | | |
| 41 Seed Lab Orgn & Maint | | | | | | | | | | | | | | | | | | 40 | | | | | | | |
| 42 Tetrazolium Testing | | | | | | | | | | | | | | | | | | 40 | | | | | | | |
| 43 Seed Pathology | | | | | | | | | | | | | | | | | | 40 | | | | | | | |
| 44 Seed Internal Quality Control | | | | | | | | | | | | | | | | | | 40 | | | | | | | |
| 45 Seed Inventory Management | | | | | | | | | | | | | | | | | | 40 | | | | | | | |
| Seed Technology for Proc & | | | | | | | | | | | | | | | | | | 40 | | | | | | | |
| 46 Proc Officers | | | | | | | | | | | | | | | | | | | | | | | | | |
| 47 Seed Equipment Maintenance | | | | | | | | | | | | | | | | | | 80 | | | | | | | |
| | | | | | | | | | | | | | | | | | | 40 | | | | | | | |



Best Available Document

Agenda 5

## IN-COUNTRY FIVE YEAR TRAINING PLANS

| Type of Training | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 Quarantine Inspections & | | | | | | | | | | | | | | | | | | 80 | | | | | | |
| 11 Crop Insurance | | | | | | | | | | | | | | | | | | 40 | | | | | | |
| 12 Farm Management | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 Seed Marketing | | | | | | | | | | | | | | | | | | 40 | | | | | | |
| 11 Technical & Management | | | | | | | | | | | | | | | | | | 40 | | | | | | |
| 2 Storage Pest Control | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 Seed Production, Marketing & | | | | | | | | | | | | | | | | | | 40 | | | | | | |
| 3 Farmers Education | | | | | | | | | | | | | | | | | | | | | 155 | | | |
| 4 Farming Maintenance | | | | | | | | | | | | | | | | | | | | | 15 | | | |
| 5 Agribusinessman Exch. Chart | | | | | | | | | | | | | | | | | | | | | 20 | | | |
| 6 Staff Management Training | | | | | | | | | | | 100 | | | | | | | | | 8000 | | | | |
| 7. Pest and Disease Identification | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 On Farm Trials Management | | | | | | | | | | | | | | | | | | | | 6000 | | | | |
| 9 for Researchers | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 On Farm Trials for Farmers | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 Local Leader Training | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 (Mechanization) | 14 | | | | | | | | | | | | | | | | | | | | | | | 40 |
| 1 Farm Trainers - General | | | | | | | | | | | | | | | | | | | | | | | | 20 |
| 2. Organization Development | | | | | | | | | | | | | | | | | | | | | | | | 20 |
| 1 Training Farmers Res. Mgmt | | | | | | | | | | | | | | | | | | | | | | | | |

APPROXIMATE TOTAL TRAINING OPPORTUNITIES 51,123

MIP 33

Best Available Document

APPENDIX F

# INDIVIDUAL INFORMATION

## A. BACKGROUND

Name as given in Identification Card _____

Egyptian Identification Card Number _____

Date of birth _____

Marital Status _____

Present Address(Street) _____

(City) _____

(Telephone No.) _____

Assigned Institute _____

Date of Appointment _____

Job Position _____

Area of Specialization _____

## B. FORMAL EDUCATION AND TRAINING

| | DEGREE | INSTITUTION | COUNTRY | FIELD OF STUDY | YEAR GRADUATED |
|---|---|---|---|---|---|
| 1. | | | | | |
| 2. | | | | | |
| 3. | | | | | |
| 4. | | | | | |
| 5. | | | | | |

C. POST-GRADUATE STUDY (Up to nine months)

| | INSTITUTION | COUNTRY | FIELDS OF STUDY | DATE ATTENDED |
|---|---|---|---|---|
| 1. | | | | |
| 2. | | | | |
| 3. | | | | |

D. IN-SERVICE TRAINING (If you have completed a training course in the last 12 months or will attend a training course, please complete)

| | INSTITUTION | TRAINING COURSE | DATE ATTENDED |
|---|---|---|---|
| 1. | | | |
| 2. | | | |

E. FUTURE TRAINING (What type of training course, both long and short term, technical and managerial do you feel you require for your professional development?)

| | TYPE OF COURSE | COUNTRY | OBJECTIVES |
|---|---|---|---|
| 2. | | | |

F. TASK ANALYSIS (What percentage of your time do you normally devote to the followng tasks?)

| RESEARCH MANAGEMENT | ON-FARM OR EXTENSION | ADMINISTRATION |
|---|---|---|

G. MAJOR RESEARCH PROJECTS (List the major research projects or other types of activities you are currently involved with and the percentage of your time devoted to them.)

1.

2.

3.

4.

5.

6.

7.

8.

H. PAPERS PUBLISHED (List titles of papers published in last 3 years)

1.

2.

3.

4.

5.

6.

7.

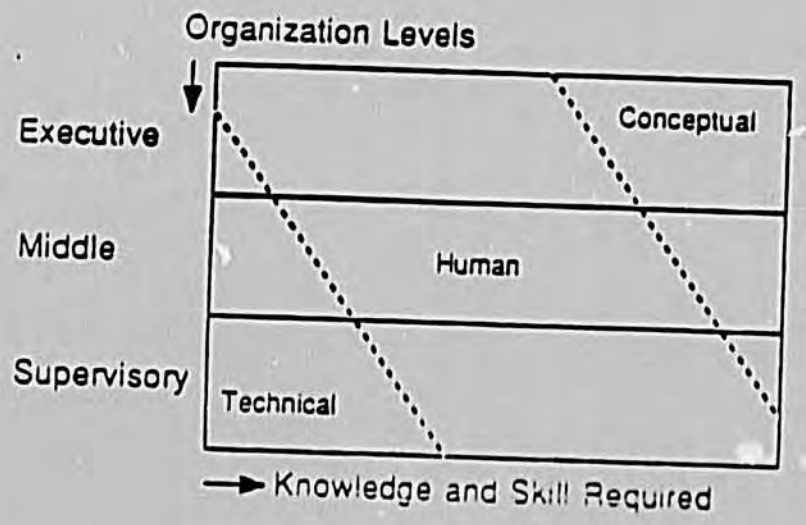
APPENDIX G

# MANAGEMENT DEVELOPMENT

One of the problems identified in Egyptian agriculture is the need to increase production and productivity. Egyptian agricultural scientists have already shown that production can be increased through working with farmers to apply advanced practices in the field. It seems that further advances could come from the agricultural system if it is organized to utilize all of its resources; human, natural and financial. The agricultural system needs to respond to the employee's producers and the consumer's needs. Many times the research revolves around the technical and not the human resources within the organization. Studies in organizational management have shown that productivity of an organization can be increased by sixty percent through effective management. Managers at all levels, executive, middle and supervisory, can be helped through management training to be more cognizant and responsive to the environmental needs.

Management staff need to be aware of changes in the organization and staff and in methods and activities to be implemented to attain success. Most people start their agricultural career in a specialized technical ability and as the person ascends in the organization there is less emphasis on the technical skills but more on the management of efforts of people.

Knowledge and skills in management must be learned as in any other technical area and it varies with the organizational level. For example the following model developed by George R. Terry[1] is very clear in the types of knowledge and skill required at various levels in an organization.




People should be promoted to managers through their ability and [illegible] to organize rather than just because they are getting older. Human and conceptual skills need to be broadened and improved. This can be accomplished through workshop seminars or on the job training [illegible]

as planning, decision making, communication, motivation, time management, listening skills, group dynamics and organizational development.

A management strategy as described by Mr. Odis Kendrick on management development needs to be developed where an organization can perform the following four fundamental functions.[2]

1. Pattern Maintenance

   The rules and roles that are the most observable part of the organization. The organization must be able to develop and maintain basic day-to-day procedures and patterns for action.

2. Goal Attainment

   The product or service of the organization. The organization must be able to set goals and objectives and develop strategies for achieving these objectives.

3. Integration

   The ultimate purpose and meaning of the organization. The organization must be able to develop dominant values that are shared throughout the organization.

4. Adaption

   The ability of the organization to meet new challenges from outside the organization. The organization must develop a sensitivity to change outside the organization and be able to change its patterns when necessary.

The agricultural institutions seem to be able to complete the first two steps but training must be developed that will help staff perform both the integrative and adaptive functions.

Managers must be able to perceive that change is possible and supported by the organization. Lecture methods which is often the method used in Egypt needs to be supported by audio-visual material and hands-on methods. Different kinds of training methods besides lectures need to be organized around problems that the managers are facing on-the-job. Management training needs to be focused on practical, learning by-doing approaches.

The action learning approach that is used in training staff in rural and social development can be helpful to tap the large amount of potential that the agricultural organization has in human resources. Samuel Paul[3] descibes this approach as a process of action in the field, not viewed as an isolated and discrete activity. It is a process in which all people involoved apply their knowledge, and generate answers together. It does not presume a "trainer" who imparts knowledge to the "trainees".

Training can improve the managers so that they can serve as both change agents and models of effective managers. The can also be used as in-house consultants or trainers to teach other employees management skills.

References

1. Terry, George R., Principles of Management, Homewood, Ill., Richard D. Irwin, 1977, p.9.

2. Calverly, Paul H., Training Needs Assessment for Ministry of Irrigation, ARE Report to Ministry of Irrigation, Cairo, Egypt, February 20,1986.

3. Paul, Samuel, Training for Public Administration and Management in Developing Countries: A Review, Indian Institute of Management, Ahmedabad, India.

APPENDIX H

# TRAINING PROCEDURES

Implementation procedures are outlined for out of country and in-country training in this appendix.

## I. Out of Country Training Procedures

The information contained herein is based on USAID Handbook 10: Participant Training, various USAID/Egypt directives, guides and staff notices. Only policies, regulations, procedures and guidance relating driectly to the participant training activities of NARP are provided.

USAID participants are defined as foreign nationals sponsored by USAID to receive training outside their home countries. Management of a participant's program, under the NARP will be the responsibility of the Out of Country Training Contractor with approval of the Director General.

Participants will be nominated by the heads of the MOA/ARC research units and selected by the Director General. This will be coordinated by the Manpower Development and Training Unit (MDTU). An United States Contractor through a host country contract with the Egyptian government will provide the identification of training institutions, implementation of programs and monitoring functions.

The word "participant" is a shortened title for "United States Agency for International Development Participant". It denotes a "participant in development". USAID participant training is a part of the development-related projects jointly approved by the Egyptian Government and the United States. Participants are obligated to utilize their training by working in the development activity when they return home.

### A. BASIC USAID POLICIES

1. All participants are subject to USAID participant training policies, regulations and reporting procedures.

2. All education and training should be closely geared to existing and expected work opportunities. Participants are obligated to return to Egypt upon completion of their planned training program and utilize their training by working in the development activity when they return to Egypt.

3. Participant training is arranged at the best available facilities to meet the training objectives within the funds available.

4. Training objectives are accomplished within Egypt whenever feasible. If this cannot be done, the next priority is to arrange participant training

in sites in the United States, international research centers or third world countries.

5. Participants proposed for training in countries where the training is conducted in English must demonstrate English language proficiency adequate to meet program requirements. USAID/Egypt Staff Notice No. 81-138 (Attachment A) describes Mission policy in this regard. See the step-by-step sequence of actions for procedural guidance. It should be noted that exceptions to English language testing and training are made for participants in technical training programs when:

   a) Groups of participants are accompanied by an official interpreter;

   b) The participant(s) has been(have) already lived or studied in an English-speaking country;

   c) Training programs are not conducted in English.

6. Participants must be medically cleared by undertaking a physical examination conducted by an Egyptian doctor under contract to USAID.

7. Participants are admitted to the United States under the USAID Exchange Visitor Program, using J-1 visas. This means they may not apply for immigrant or non-immigrant visas until two (2) years' residency is completed in Egypt following their return after training.

8. All participant training costs are paid out of NARP funds, with several minor exceptions. Some English language training and pre-departure physical examinations will be, paid from USAID/Egypt funds. The only Government of Egypt (GOE) cost is for the participant's regular salary during the term of training.

9. Evaluation of participant training is conducted on a continuing basis.

10. Participant training is conducted in compliance with the Civil Rights Act of 1964.

11. Academic training leading to a degree is requested when the degree is essential to the position for which the participant is to be trained.

12. A participant's academic degree program is limited to one degree only.

## B. OTHER PERTINENT POLICIES AND REGULATION

1. Processing Lead time: The project implementation order/Participants (PIO/P) and all other documentation (copies of degrees and credit transcripts, letters of recommendation) must be received by the U.S. Contractor in advance of starting dates, as follows:

   Academic Training : 150 days
   Technical Training : 90 days

2. Medical certification: Each participant must be officially certified as physically and mentally fit by a qualified physician prior to departure for training. Such certification will mean freedom from communicable diseases or any illnesses or debilitations which would limit, shorten or impair the participant's ability to pursue the training program on schedule. Exemption from certification can be made on a case by case basis by the USAID/NARP Director General.

3. Travel

   a) All travel must be on U.S. flag carriers.

   b) Economy-Class travel is mandatory.

   c) Twenty-two pounds of accompanying excess baggage are allowed if not provided free by the airline.

4. Dependents: USAID does not encourage dependents to accompany or join participants, especially short term technical trainees, unless the GOE and USAID/Egypt approve such action. Approved dependents may accompany or join participants while they are in training in the United States, provided:

   a) The participant is scheduled to remain in one place for at least six (6) months;

   b) The participant furnishes proof of adequate financial resources over and above the USAID maintenance allowance, without working for pay to cover such expenses, including a round-trip airline ticket in advance for each dependent, by submitting Form USAID 1380-5, Dependent Certification

   Only the participant can initiate the request for dependents to accompany or follow, not the dependents. They must be covered by a health and accident insurance policy. (They are not eligible for the USAID Health and Accident Insurance Coverage program.

5. Allowance: USAID financed participants under the National Agricultural Research Project will receive an allowance to cover living and incidental expenses while engaged in their official training program. An advance according to regulations will cover the first participant before departure. A second check after arrival. Both payments are intended to cover all expenses including taxis and within-city transportation for the first 30 days only.

   After the first 30 days Academic participants will receive a monthly allowance based on the Bureau of Labour Statistics Cost-of-living Index. Rates differ per month depending on the institution.

After the first 30 days technical (non-academic participants) will receive a monthly allowance for their entire program, provided they stay in one location 30 days or longer.

All participants will receive a per diem in addition to their monthly maintenance allowance, while in official travel status during any part of residence program.

The maintenance allowance provided is considered adequate for meeting the cost of moderately priced living accomodations, food, local travel costs and incidentals. These are current rates that are reviewed periodically and are subject to change as required.

Participants also receive certain allowance for books and other training materials required for their program. The purchase of any special training equipment is subject to approval in advance by the NARP-Director General.

6. Health and Accident Insurance Coverage. USAID participants under the National Agricultural Research Project are covered by the USAID self-funded Health and Accident Insurance coverage (HAC) program. Coverage begins immediately on the date of departure for the United States and continues until the participant returns directly to Egypt or is released from USAID's responsibility, whichever is first. The current monthly cost per participant is $25, payable from project funds. As stated previously, accompanying dependents must have health and accident insurance coverage, but they are not eligible for the HAC program.

7. Return Processing: Upon return to Egypt after completion of training, all participants are required to report to USAID/Egypt's Training Office, regarding their training program. At this time theCertificate of Achievement is awarded.

Sequence of actions

On the following pages is a chronological sequence of actions which take place during the participant processing period, from the time the trainee is proposed by the NARP Director and his staff to the time of departure from Egypt.

| ACTION TAKEN | RESPONSIBILITY OF |
|---|---|
| 1. Field training selected by the Research Unit Director (RUD) and approved by the training unit (MDTU) & NARP Director General (DG) | RUD<br>MDTU/DG |

| | |
|---|---|
| 2. Names of Staff are selected by the Research Unit Director and approved by the Director General and forwarded to the MDTU who will arrange English language testing and training with USAID or private. | RUD<br>DG<br>MDTU |
| 3. USAID (EDU) arranges for ALIGU English Language testing at the American University in Cairo (AUC) and informs MDTU of time, place and date. MDTU then informs the Research Unit Director to inform the participant of testing date, time and place. | USAID/EDU<br>MDTU<br>RUD |
| 4. Participant takes test as scheduled, and test scores are provided to USAID Project Officer. The USAID Project Officer informs MDTU,and they inform the Research Unit Director who informs the participant of score. | Part<br>USAID/EDU<br>MDTU<br>RUD |
| 5. Letter of Nomination for training is submitted by the RUD and approved by the NARP Director General. The letter is not sent until the participant has taken the ALIGU English Language Test and has passed and been scheduled for English Language training. | RUD<br>DG |
| 6. Participant Commences English Language Training. Academic Trainees will usually enroll in intensive training at the English language program at AUC or the Amercan Cultural Center (ACC) in Alexandria, providedentrance level scores have been attained. For technical trainees, the low or medium intensity programs may be provided by private contractor or AUC. | Participant |
| 7. Program Description is submitted by Research Unit Director to MDTU and forwarded to the Contractor and with copy to USAID. A clear description of training desired by type and level, and purpose for which training will be applied, is to be provided. Degree objectives, if appropriate, major field of study and suggested training facilities are to be identified. Sufficient detailed information must be provided in order that a program can be planned and arranged by the U.S. Contractor that will provide maximum benefit to the participant and the project. | RUD<br>MDTU<br>Contractor<br>USAID |
| 8. Preliminary processing of participant by Contractor advising of requirement for certain documents, medical examination, passport, visa, etc. | Contractor |
| 9. PIO/P is prepared byContractor. Procedures are discussed and the participant is advised of additional documents needed, requirement for a passport- | Contractor<br>Participant |

type pictures and completed Biographic Data Form. (The Biographic Data Form is page 3 of the PIO/P.

| | |
|---|---|
| 10. English language training is completed. Qualifying ALIGU scores are received by USAID/EDU and MDTU passes the score to Contractor. When the institutios requires a TOEFL score the participant must-schedule the TOEFL EXAM. | USAID/EDU<br>Contractor<br>MDTU<br>Participant |
| 11. PIO/P and all other documents required are sent to USAID/Cairo requesting that a student be processed after an appropriate program has been arranged by the Contractor. A Training Implementation Plan (TIP) will be forwarded to MDTU and DG for review/appoval When the proposed program has been approved by all parties concerned, USAID/Cairo will be notified. The Contractor will provide a Call Forward date. | Contractor<br>USAID/EDU<br>MDTU/DG |
| 12. Director General notifies the Contractor of TIP approval, with modifications as necessary, and requests a firm C/F date. | DG/MDTU<br>Contractor |
| 13. The TIP and tentative Call Forward (C/F) are received by participant and MDTU (approximately 45 days after receipt of documents by the Contractor. | Participant<br>MDTU<br>Contractor |
| 14. Participant is notified byContractor of any further requirements prior to departure. | Participant<br>Contractor |
| 15. Firm C/F recieved by MDTU and USAID/Cairo and participant are notified. | USAID/<br>MDTU<br>Participant |
| 16. MOA issues letter to Particpant authorizing departure from Egypt. | GOE/MOA |
| 17. Contractor prepares Advance Maintenance Allowance and obtainsU.S. visa (2 weeks before departure). | Contractor<br>Participant |
| 18. Participant advised of Pre-Departure Orientation schedule | Participant<br>Contractor |
| 19. Pre-Departure Orientation (3-4 days before departure.)<br>a. Advance per diem check issued<br>b. Tickets provided<br>c. Entire training program discussed<br>d. Advice provided on airport reception, travel, etc.<br>e. Travel restrictions agreement signed | Participant<br>Contractor |
| 20. Departure. | Participant |

## II. In-Country Training Procedures

Public and Private Sector Personnel Training:

A cadre of public (governmental) personnel and private sector individuals which includes farmers (male and female), equipment operators, researchers and other persons engaged in or suporting the research activities in Egypt agriculture are to be trained.

In-Country Training Plan Design:

An annual training plan is required by USAID and GOE. The plan will be prepared by the Manpower Development and Training Unit and approved by the Director General each year.

Training Activities:

The Manpower Development and Training Unit will be responsible to:

1. Identify and classify in-service training needs.
2. Carry out research and studies necessary to develop training process.
3. Keep records and books of training data.
4. Develop and co-ordinate activities with training organizations, institutes and centers in order to acquire more experience for preparing project training plans.
5. Set up an in-country and participant training plan that is consistent with the general training policy of the project and to achieve this, all candidates are required to submit reports and complete evaluations about their in-country training.
6. Identify training priorities in light of training needs and available financial and administrative support.
7. Co-ordinate the use of essential training materials and audio-visual aids.
8. Spread training awareness through bulletins, meetings, workshops, etc.
9. Monitor trainees during their training programs and to follow-up their activities after their return to their activities after they return to their villages.
10. Evaluate the training program in terms of subject and instructors to ensure that the program is efficient and achieves its aims and objectives.

Trainees:

The following conditions apply to the trainees:

1. Should be at least 16 years of age.
2. Should have an identification card.
3. Is willing to accept the accommodation and training provided by the project.
4. Trainees in each course should have similar backgrounds.
5. Will not be absent for more than 7 days during any one course without an acceptable excuse or will be dropped from the course.
6. Additional regulations or instruction established by the project management will be distributed to all concerned.

Training Budget:

Training activities will be estimated on the basis of financial limiations of the annual training plan.

The training budget should include the following items:

1. Lecturers and instructors, supervisors, inspectors and guide fees,
2. Equipment rental,
3. Fuel, oil and lubricants,
4. Audio-visual aids and equipment,
5. Equipment and machinery operators,
6. Room and board,
7. Transportation,
8. Expendable training materials,
9. Incidental living expenses,
10. Training Center fees,
11. Administrative expenses,
12. Miscellaneous.

Follow-up and Training Evaluation:

The project training unit is responsible for following-up and evaluating training activities according to the overall plan to ensure its success in terms of implementation.

In order to carry out the above, the unit should request inputs from the technical units of the project or outside sources.

A report at the end of each course will be submitted to project management. This report will include the results of the evaluation.

At the end of the training period, the project will present the trainee with a certificate officially approved by project management.

Training Records and Books:

Records are kept by the training unit for registering all activities related to the training course held by the project abroad or in-country. These records are kept for future references for all data collected and statistics compiled on project training activities.

Executive Bodies, Lecturers, Instructors, Supervisors, and Guides:

The MDTU is authorized to request support from experienced institutes and centers either abroad or in-country to assist in carrying out planned training programs by providing selected lecturers, instructors, supervisors, guides and services workers for the training programs as follows:

1. The lecturers and instructors should be scientifically and practically oriented as well as educationally capable.

2. The supervisor should have leadership capability and be from the project or components staff or from outside sources if necessary; his job is as follows:

   a. To plan and follow-up program implementation with instructor,

   b. To solve problems impeding implementation,

   c. To administer and manage training courses and provide necessary support (Audio-visual aids and materials) to instructors and lecturers,

   d. To provide trainees with alternate lecturers and instructors in case scheduled original instructors or lecturers are absent,

   e. To provide evaluation plan to the program as a whole including lecturers, trainees and instructors,

   f. To brief lecturers and instructors and supervisors before a program begins.

3. Whether the program guide is chosen from the project or from outside sources, he should be highly efficient and specialized in the planned program and complete the following:

   a. Study the program in detail.

   b. Contact the programs' lecturers and instructors and brief them about the program and trainees.

   c. Direct workshop and make decisions necessary to the implementation of the program.

   d. Maintain discipline among trainees participating in the training course.

   e. Submit a report on the lecturers and instructors.

   f. Participate in the program evaluation.

   g. Assist in preparing lectures and training materials.

4. A secretary for each course is to be assigned to do the following:

   a. Clerical and administrative tasks.

   b. Keep attendance and report trainee absences.

   c. Introduce lecturers.

   d. Type, print and distribute lecture notes related to the course.

5. Caretakers are to be assigned at the training location at a ratio of one to twenty trainees or less to provide miscellaneous services.

<u>Lecturer and Instructor Fees</u>

1. Fees paid to the lecturers and instructors for workshops, seminars and discussions are determined according to the following rules :

   a. LE 50 for an one hour lecture from an undersecretary and above, or university professors and equivalent.

   b. LE 40 for an one hour lecture from a director general and above and/or university professor assistant and equivalent.

   c. LE 30 for an one hour lecture from a lecturer or other ranks.

2. Field Instructors demonstrating to trainees in the field are paid at a rate of 50% of the above rate.

302

3. A maximum of LE 10 per day is paid to supervisors, inspectors, coordinators, guidance and field monitoring staff.

4. A maximum of LE 8 per day is paid for secretarial, financial and service workers.

5. All lecturers and instructors are fullly accommodated with room and board when attending courses in addition to the actual transportation cost to and from the training centers.

6. Translation and typewriting:

   a. Oral translation according to lecturers fees and categories;

   b. Written translation will be paid according to USAID regulations; and,

   c. Typing according according to USAID rules.

7. In items 3 and 4 staff will not be paid these fees if they receive incentives from the project.

Training Expenses

1. The following costs are convered for all trainees attending courses:

   a. LE 10 per day for room and board for trainees when accomodations are not available at the training center or live more than 50 kilometers from the training center or outside the governorate.

   b. LE 3 per day for incidental living expenses.

   c. Actual transportation expenses to and from training centers and/or the locations.

Training Center Fees

Training centers which have their own financial by-laws will determine the training center fees according to their by-laws for training programs conducted for the project.

Training centers without financial by-laws will have their training center fees estimated by agreement between the center's staff and the NARP staff.

Project management may choose to establish additional rules and regulations within the boundaries of the NARP training guidelines in order to ensure the successful implementation of the training plan.

# PUBLICATIONS

| PUBLICATION TITLE | PUBLICATION NO. |
|---|---|
| - Progress Report<br>CID, Progress Report for Period<br>(November 6, 1986 through January 6, 1987) | 1 |
| - Quarterly Report<br>(January 1 through March 31, 1987) | 2 |
| - Implementation Workshop - Proceedings<br>(February 9 - 17, 1987) | 3 |
| - Quarterly Report<br>(April - June, 1987) | 4 |
| - Life of Project Plan<br>(September, 1987) | 5 |
| - Implementation and Financial Plan, Fiscal Year 1987-1988<br>September, 1987 | 6 |
| - Manual for Grant Research Under NARP<br>October, 1987 | 7 |

## DISTRIBUTION

| NO. | | |
|---|---|---|
| 6 | Dr. Ahmed Momtaz | Director General, NARP,Director ARC |
| 1 | Dr. Robert Witters | Chief of Party, CID/NARP TA Team |
| 1 | Dr. Yehia Hassan | Chairman, Foreign Agricultural Projects Committee |
| 1 | Dr. M. Sattour | Deputy Director, ARC |
| 1 | Dr. Abdallah Nassib | Director, Field Crops Research Institute |
| 1 | Dr. Samir Moustafa | Director, Cotton Research Institute |
| 1 | Dr. Ahmed Nour | Director, Sugar Crops Research Institute |
| 1 | Dr. Kamla Mansour | Director, Horticulture Research Institute |
| 1 | Dr. Moustafa Hathout | Director, Animal Production Research Institute |
| 1 | Dr. Hosny El-Sawah | Director, Animal Health Research Institute |
| 1 | Dr. Sayed A. Salama | Director, Veterinary Serum & Vaccine Research Institute |
| 1 | Dr. M. Sabry Tawfik | Director, Animal Reproduction Research Institute |
| 1 | Dr. Ahmed El-Sehrigi | Director, Agricultural Mechanization Research Institute |
| 1 | Dr. Youssef A. Hamdi | Director, Soils and Water Research Institute |
| 1 | Dr. Taha El-Sharkawi | Director, PLant Pathology Research Institute |
| 1 | Dr. Ahmed Khattab | Director, Plant Protection Research Institute |
| 1 | Dr. Mohamed Sharaf | Director, Agricultural Economics Research Institute |
| 1 | Dr. Ahmed El-Rafei | Director, Agricultural Extension and Rural Development Research Institute |
| 1 | Dr. Zakaria El-Attal | Director, Central Agricultural Pesticides Lab |
| 1 | Dr. Ahmed Abdel Halim | Director, Central Laboratory for Statistics |
| 1 | Dr. Akila Salleh | Director, Central Lab for Food and Feed |
| 1 | Dr. Ismail Darrag | Director, Agricultural Research Stations |
| 1 | Eng. Ali Nashaat | Secretary General, ARC |
| 1 | Dr. Abdurabbo Ismail | Director, Specialized Extension, ARC |
| 1 | Dr. Alaa Eldin Z. Bondok | Head, Central Administration for Minister's Office, MOA |
| 1 | Dr. Adel El-Beltagi | Head, Central Administration for Minister's Office, MOLR |
| 1 | Acc. Kamal Reda | Head, Financial and Administrative Affairs Sector, MOA |
| 1 | Eng. Adel Ezzi | Chairman, Agriculture Development and Credit Bank |
| 1 | Dr. Abdel Salam Gomaa | Head, Central Administration for Seeds, MOA |
| 1 | Dr. Yassin Osman | Head, Central Administration for Pest Control, MOA |

| | | |
|---|---|---|
| 1 | Eng. Mohamed Dessouki | Head, Central Administration for Agricultural Foreign Relations, MOA |
| 1 | Dr. A. Moneim Barakat | Head, Central Administration for Animal Health, MOA |
| 1 | Eng. Mahmoud Nour | Supervisor, Central Administration for Planning, MOA |
| 1 | Eng. Abdel-Razik Badawy | Head, Central Administration for Animal Production, MOA |
| 1 | Eng. Fouad Abo-Hedb | Chairman, West Nobaria Company |
| 1 | Dr. Ibrahim Antar | NARC Member |
| 1 | Dr. Ahmed Abdel-Rahim | Technical Trusteeship for Research Institutes, ARC |
| 1 | Dr. Mahmoud El-Barkouki | NARC Member |
| 1 | Dr. Bakir Oteifa | Chairman, Grant Program Working Group |
| 1 | Eng. Aly Salem | Chairman, Construction Working Group |
| 1 | Dr. Hassan Khedr | Chairman, Data Collection Working Group |
| 1 | Dr. Yeldez M. Ishaq | NARP News |
| 1 | Dr. Mohsen El-Didi | NARP News |
| 1 | Eng. Aly Abo-Gazia | Chairman, Horticulture Crops Exporters Union |
| 1 | Mr. Cory Wengreen | Administrative Services Advisor |
| 1 | Dr. Willis McCuistion | Interdisciplinary Research Advisor |
| 1 | Dr. Ralph Finkner | Research Station Management Advisor |
| 1 | Dr. Gordon Beckstrand | Deputy Chief of Party/On-Farm Research and Demonstration Advisor |
| 1 | Dr. Amir Khan | Agricultural Mechanization Advisor |
| 1 | Dr. Robert Harwood | Integrated Crop Protection Advisor |
| 1 | Dr. Bill Gregg | Seed Technology Advisor |
| 1 | Prof. Richard Foote | Research Studies Coordinator |
| 1 | Dr. Susan Emerson | Library and Information Services Specialist |
| 1 | Ms. Coleen Brown | Deputy Chief of Party/Training and Manpower Development Advisor |
| 6 | Mr. John Foti | AID/NARP Project Officer |
| 2 | Dr. H. Matteson | CID/NARP Project Director, NMSU |
| 2 | Dr. Earl Kellogg | CID Executive Director |
| 20 | ARC Libraries | Director General Office |

# PRELIMINARY PROPOSAL

# CENTRAL SERVICES UNIT

NATIONAL AGRICULTURAL RESEACH PROGRAM

AGRICULTURAL TOTAL RESEARCH CENTER

DOKKI, GIZA

# PRELIMINARY PROPOSAL

## Central Services Unit
## The Agricultural Research Center

### Introduction :

The Agricultural Research Center has a large fleet of automobiles, farm equipment, laboratory equipment, Electronic Instruments, air conditioners as well as many buildings and properties which need regular repair and maintenance. Many ARC vehicles, farm machines and laboratory equipment are currently lying idle or deteriorating due to lack of proper service and maintenance. Because of a lack of preventative maintenance, most of the functioning equipment is also not in too good a shape. It is obvious that the present system of service and maintenance at ARC must be substantially improved to provide quality service to efficiently operate a large research system such as the ARC.

### Existing Service & Maintenance :

Presently there are no centralized procedures and arrangements within ARC for repair and maintenance of its equipments and properties. Each ARC institution follows its own approach for repairing and maintaining its equipment and facilities.

a) **Automobiles, Tractors and Farm Machinery :**

A few ARC institutions maintain a small staff for minor service and repair of motor vehicles and farm machines. Invariably all major repair and maintenance work is handled individually through private repair and service shops. This practice is costly, wasteful and results in untimely and often unsatisfactory repair and maintenance.

During the last few years, five automobile, tractor and farm machinery repair shops were established under the EMCIP program at Sakha, Gemmiza, Shandaweel, Sids and Dokki. The first four of these shops are now fully functional and the Dokki unit is now being organized. These units were strategically sited to provide auto-tractor-farm machinery repair and maintenance to different ARC institutions, In effect however, these units are catering only to the institutions in which these are physically located. Lack of adequately trained and experienced staff continues to be a chronic problem with their operation and hence the quality of service is not entirely satisfactory.

b) **Laboratory & Instrument Repair Service :**

The matter of maintaining costly laboratory equipment and instruments is even more critical. There are virtually no facilities or staff in ARC for such maintenance and consequently all laboratory equipment and instruments are repaired and maintained, on a crisis to crisis basis, through private service shops in Cairo. Since most laboratory equipment and instruments are of a specialized nature, obtaining prompt and satisfactory service through private shops has always been a problem. Often costly equipment remains idle and deteriorates due to lack of minor spare parts or repairs.

c) **Air Conditioning, Electrical and Building Maintenance**

Presently all ARC institutions depend on private shops and contractors for air conditioning repairs and other similar services. The ARC has inadequate arrangements for repairs of buildings and properties and no shops for electrical, plumbing, carpentry, and masonry repairs. Such repairs are done by outside contractors on an adhoc basis. The difficulties, delays and hassle encountered by each ARC institution in obtaining such services results in badly needed repairs being neglected and in the generally delapidated condition.of some of the ARC buildings and facilities.

d) Central Store:

ARC maintains a central spare parts store at Dokki with small sub stores at four satellite workshops. Parts inventory and distribution however is not satisfactory because of the inadequate storage system, and non-computerized inventory controls. A lack of organized system for ordering, distribution and issuing of parts results in poor availability of parts which further complicates the ARC's service and maintenance problems.

Proposal Outline :

There is no doubt that the quality of research at ARC institutions could be improved substantially if an effective in-house arrangement could be developed to provide reasonable day-to-day service for the many and facilities equipment and instruments that are now with ARC. Many costly equipment, which are not functioning now, could be repaired and put back into service with considerable savings. Also, an in-house capability to advice, check and oversee the quality of repair and maintenance from private shops can substantially improve research productivity.

To minimize some of the repair and maintenance problems and to improve the quality of services, it is proposed that a Central Services Unit (CSU) be established within ARC. Undoubtedly any effort in establishing a first rate repair and maintenance system at ARC will have a significant long-range impact on improving research productivity, far beyond the immediate investments.

It is proposed that the Central Services Unit (CSU) be established as an independent unit directly under the ARC administration or as part of the NARP with its own management, budget and a small core of well trained engineering supervisory staff in the services & maintenance of (1) Auto, Tractor and Machinery (2) Laboratory Equipment and Electronics Instrumentation (3) Air-Conditioning, and Building Maintenance eg. mechanical electrical,, plumbing, carpentry, masonry, painting ..etc. (4) Spare Parts Storage, Distribution and Control.

The five existing ARC auto-tractor-farm machinery repair shops at Sakha, Gemmiza, Shandaweel, Sids and Dokki could be expanded, and placed under the CSU control. These could be equipped with major repair and maintenance equipment, mobile workshops, tow-trucks and other facilities to cover the above three groups of repair and maintenance services. In case of the electronics & laboratory equipment, perhaps a single centralized service facility at Dokki may be sufficient to provide adequate service to all ARC Indtitutions.

It is important that the CSU is operated in an efficient business like manner and hence it is proposed that ARC enter into specific period contracts with selected well qualified private firms to manage and provide day to day repair and maintenance service at each of the five CSU service shops locations. Under such an arrangement, selected private repair and service shops will be conveniently located in well equipped ARC facilities to provide prompt quality-service to different ARC Institutions with arrangements for billing of charges for the specific service provided to CSU or to requesting ARC Institution.

The CSU unit should maintain an adequate spare parts inventory at Dokki and the four sub-service locations to provide parts to service contractors and to debit costs to concerned ARC institutions. Prompt availability of spare parts is crucial in providing quality service and maintenance. The present system of spare parts storage and delivery needs to be modernized with computerized inventory controls and efficient distribution system to ensure prompt parts availability.

In order to maintain the ARC equipment & facilities adequate funds must be available either to CSU or to each ARC Institution in its annual budget allocations. Provisions have been made in this proposal for an annual ARC maintenance budget based on 10% of the estimated total cost of equipment owned and operated by ARC Institutions. These may have to be revised on the basis of more presise estimate of total equipment costs. The structure of the proposed ARC/CSU Repair and Maintenance System is graphical presented in Fig. 1. Rough preliminary - budget for the CSU is given in Appendix I. As suggested in the recommendations this budget must be revised after a detailed analysis of the functions, facilities, staffing and other requirements of the CSU.

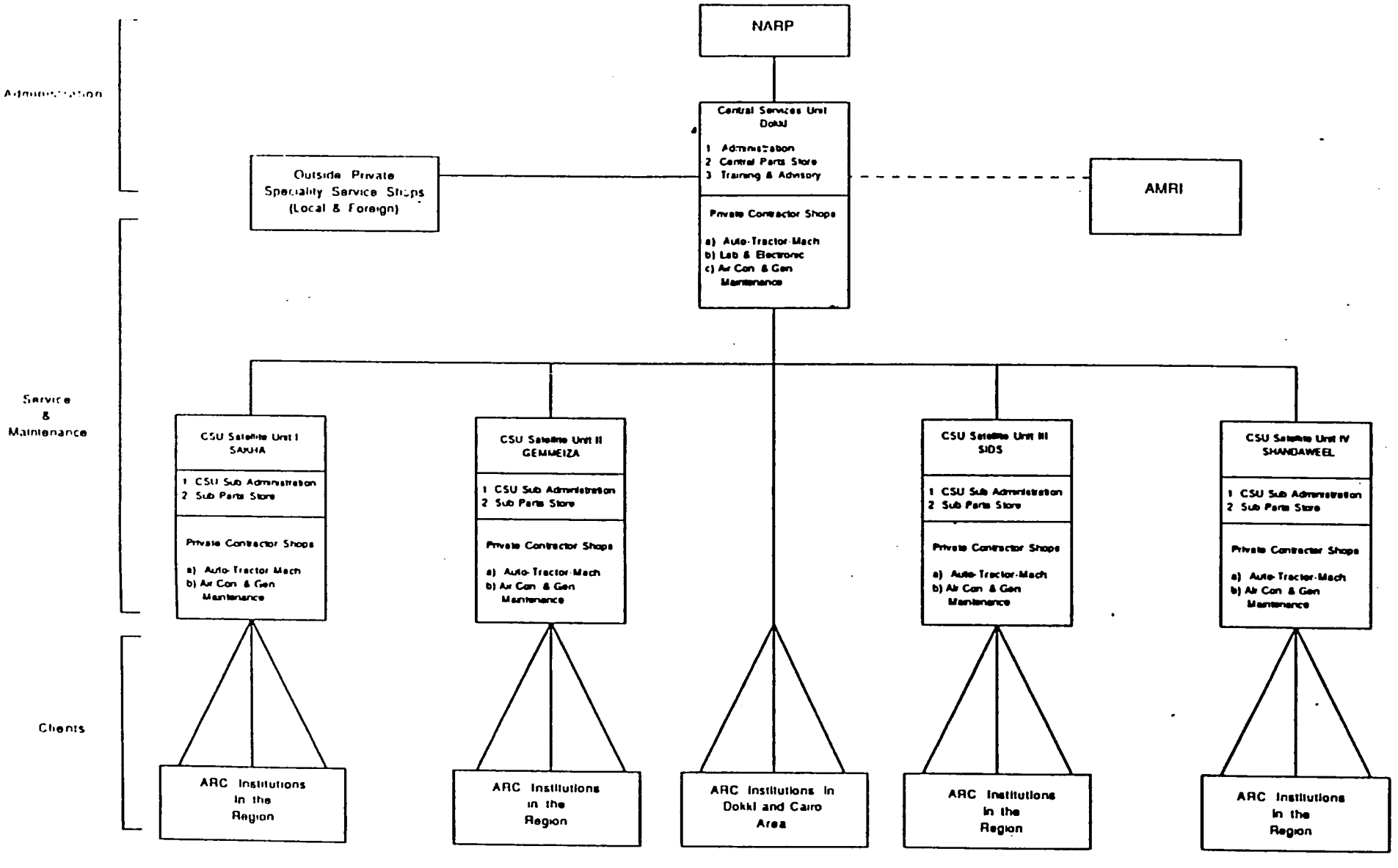

Administration
Service & Maintenance
Clients
NARP
Central Services Unit Dokki
1 Administration
2 Central Parts Store
3 Training & Advisory
Private Contractor Shops
a) Auto-Tractor-Mach
b) Lab & Electronic
c) Air Con & Gen Maintenance
Outside Private Speciality Service Shops (Local & Foreign)
AMRI
CSU Satellite Unit I SAKHA
1 CSU Sub Administration
2 Sub Parts Store
Private Contractor Shops
a) Auto-Tractor-Mach
b) Air Con & Gen Maintenance
CSU Satellite Unit II GEMMEIZA
1 CSU Sub Administration
2 Sub Parts Store
Private Contractor Shops
a) Auto-Tractor-Mach
b) Air Con & Gen Maintenance
CSU Satellite Unit III SIDS
1 CSU Sub Administration
2 Sub Parts Store
Private Contractor Shops
a) Auto-Tractor-Mach
b) Air Con & Gen Maintenance
CSU Satellite Unit IV SHANDAWEEL
1 CSU Sub Administration
2 Sub Parts Store
Private Contractor Shops
a) Auto-Tractor-Mach
b) Air Con & Gen Maintenance
ARC Institutions in the Region
ARC Institutions in the Region
ARC Institutions in Dokki and Cairo Area
ARC Institutions in the Region
ARC Institutions in the Region

Figure 1

Under the proposed hybrid management system, the small regular CSU/ARC staff will **1.** Facilitate and supervise the operations of the private contractor shops, **2.** will provide the necessary spare parts **3.** will inspect and certify each service job done by the contractors for satisfactory quality and charges and **4.** give general advice and training to the ARC scientists and staff in the selection and use of laboratory equipment.

It is important that ARC/CSU staff is sufficiently qualified, experienced and practical to interact meaningfully with the contractors staff. The CSU staff must be well versed in each technical area to check, certify and advice on technical and service matters and to ensure that the contractors are abiding fully by their contractual-obligations.

## SOME IMPORTANT ISSUES

In proposing the above service and maintenance system for ARC the following issues were given due considerations :-

1. The success of the CSU will depend to a large extent, on the calibre of the technical staff and management skills that it could attract. The present system of employment in ARC is not sufficiently remunerative to attract well trained mechanics, technicians, engineers, and technical managers, who are in great demand in the private sector and in overseas markets. The proposed system will permit attracting the best possible talent through private contractors for providing top quality repair and maintenance service.

2. Since the character and staff requirement for service and maintenance work are quite different than that of Agri. Mech. research, the CSU is proposed as an independent unit from the AMRI. Experience indicates that whenever service and research are combined, service invariably attracts greater priority there by seriously hampering the development of research programs. Separating CSU and AMRI will permit simultaneous development of both the repair and maintenance services and the agricultural mechanization research programs in ARC.

3. ARC through its NARP Program can expand its present repair and service shops and equip these with modern basic repair and service equipment which contractors will find it difficult to do. The private contractors must however.provide the basic hand tools and other portable equipment for operating the service and maintenance shops.

4. The proposed system will effectively tap the strength of the ARC/NARP in establishing first rate repair and service facilities and the management and technical skills of the private sector in providing top quality day-to-day service to ARC affiliated institutions.

5. The proposed system will permit effective utilization of existing ARC maintenance staff and repair facilities without interruptions and dislocations. The present service and maintenance staff could be utilized in their parent institutions for providing minor maintenance service Training of existing ARC service and maintenance staff will require due attention and must be included in the overall training programs of the CSU.

6. The proposed system will permit a reasonable degree of centralized ARC supervision and control on the quality of repair and maintenance provided by contractors who's services would be subject to periodic assessments, reviews and continuation.

7. The system will permit the development of adequate parts storage at appropriate locations with systematic replenishment of parts, inventory controls, distribution, and record keeping.

8. The system will enable ARC to transfer the full responsibility of maintaining equipment and facilities to respective ARC institutions, where the equipments or facilities are physically located through carefully controlled service and maintenance budgets.

9. The system will permit better control of service quality and minimize chances of mismanagement or irregular expenditures since all in-house and outside repair jobs will be channeled through the CSU Dokki or its sattelite units.

## ARC-CONTRACTOR RESPONSIBILITIES & RELATIONSHIPS

Close working links will have to be maintained between the CSU, supervisory staff and the private contractors as this would be crucial to the success of the proposed service and maintenance system. It should be emphasized that this relationship must be looked as that of two partners and not adversaries in providing quality service to ARC Institutions. Adequate contractual safeguards would have to be provided for proper care of ARC equipment and facilities and for ensuring that the contractors service operations are viable and attractive for providing continual good quality service.

Selection of good reputable contractors would be critical for providing quality service to ARC. It is important that only firms who have a good track record for providing quality services in the country are invited to submit applications to ARC. A list of qualified contractors, eligible for ARC service-contracts, must be developed through prior assessment of existing facilities,staffing, service-reputation and general business dealings of the major service contractors in the country. Firms which have no background or reputation for service or are newly organized must not be eligible for ARC-service contracts. In order to attract quality contractors, ARC may have to provide minimum annual business guaranties which could be derived from the current levels of service expenditures in ARC.

The important considerations that would dictate the ARC-Contractor relationships are discussed below : -

1. ARC will set up the following repair and service shops at Dokki and at the four satellite service locations with the critically needed basic test, service and maintenance equipment. for :-

    a) Automobiles, Tractors & Farm Machinery service.

    b) Electronic & Laboratory equipment service.

    c) Air Conditioning and general building maintenance service.

The ARC must install only the critically needed equipment in its shops and avoid installation of highly specialized equipment which may take unnecessary space and interfere in providing regular day-to-day repair and maintenance service by contractors. For example specialized jobs, such as crank-grinding, cylinder-boring etc are so infrequent that these could be better handled through outside non-contracter speciality shops.

2. The ARC will provide necessary pick-up trucks, mobile workshops, tow-trucks and mobile repair vans to enable contractors to provide repair and maintenance service in field and research station locations.

3. The ARC will provide the above shops and equipment to contractors on mutually satisfactory lease arrangements, either on a rent free or on a fair-rental basis (annual rent of app.8-10% of equipment investment), for specific periods.f

4. The service contractors must be required to provide all hand tools and other portable equipment necessary for providing repair and maintenance service.

5. Each contractor must have full control of the respective ARC service shops, and equipment for specific periods under a contractual arrangement which must include at least the following minimum conditions :

   a) The ARC shop equipment and facilities will be used exclusively for repair and maintenance of the ARC equipment and will not be utilized for non-ARC repair and service jobs.

   b) The contractor will take every care to maintain the ARC service and maintenance equipment and facilities in good working conditions at all times.

   c) The ARC equipment and facilities will be returned to ARC in fully operational condition on the termination of the contract. The contractors will be responsible for any costs incurred by ARC in repairing, reconditioning or replenishing equipment ARC shops and during or at the end of the service contract.

d) The contractor will deposit 10% of the value of the ARC equipments as a security deposit which will be retained by the ARC till the contract is terminated and all accounts are settled between the ARC and the contractors.

e) The service contracts between ARC and the Contractors would be subject to termination by either party with 60 days written notice and without giving any specific reasons for the termination.

f) The ARC/CSU staff will conduct periodic (every 6 monthly or so) inspection and inventory checks on the ARC equipment, and facilities provided to the contractors and make appropriate recommendations to contractors for necessary repairs, replenishment and reconditioning of the ARC equipment and facilities.

g. The ARC will maintain appropriate insurance coverage for the ARC equipment, vehicle and other facilities provided to the contractors under the service contracts.

6. All service job-requests originating from different ARC Institutions, would be channelled through the CSU central or sattelite units. Specific job orders will be issued by the respective CSU unit to contractors after ascertaining the availability of necessary spare parts.

7. While every effort will be made to route all ARC repair and service jobs through the service contractors. The CSU will decide as to the best approach for completing a job. eg. through the ARC service-contractors or through independent local or foreign repair and service shops or any other alternative means.

8. The ARC/CSU staff will develop a schedule for costs of standard routine service and maintenance jobs in each of the speciality areas by surveying local market and in consultation with the contractors. These schedules will be updated periodically and will be used in guiding the billing charges for the routine services.

9. For all non-routine service and maintenance jobs, the contractors will submit estimates and obtain prior approval from CSU before proceeding with the jobs.

10. On completion of each repair job by the contractor, the CSU staff will inspect the work and certify to its satisfactory completion and appropriateness of the service charges.

11. Special attention must be paid by ARC in insuring that contractors are paid within a specified period after the satisfactory completion of each job . Excessive red tape, payment delays and other similar difficulties can become serious constraints in obtaining satisfactory repair and maintenance service from the contractors.

## Recommendations

It is recommended that the services of a team of maintenance experts, local or expatriates in :1) Management of large maintenance systems 2) Automobiles/Tractors/Agricultural Machinery service 3) Electronices Laboratory equipment maintenance and 4) Air conditioning and general building maintenance be acquired for eight weeks to develop a detailed proposal for the Central Service Unit of ARC. Detailed job descriptions of the technical team members are given in appendix II. The scope of work of the technical team is given below :-

a) Develop detailed plans for the ARC Central Service Unit after 1) appropriate consultations with the client ARC institutions 2) surveying potential local service contractors and 3) a through analysis of the best possible approach for providing top-quality repair and maintenance service at ARC.

b) Develop a list of basic equipment needed for the ARC shops and other repair facilities in each of the three speciality areas.

c) Develop detailed budgets, staffing and other resource requirements for establishing the repair and maintenance system at ARC.

d) Develop detailed procedures, guidelines, and necessary documentary materials for day-to-day management and operation of the service and maintenance units.

e) Develop sample contract documents that ARC could use in entering into contractual service arrangements with private firms.

f) Develop detailed plans for modern spare parts storage facilities with computerized inventory controls, techniques and procedures.

g) Develop recommendations for training requirements for managing and operating the service and maintenance system along with the training of existing ARC service personnel.

h) Develop recommendations for necessary technical assistance in specific technical areas that may not be available in the country.

MAINTENANCE

November 1st,1987

ARC/NARP

Central Services Unit

Budget 1988-1993

(5 Years)

| | | Giza Head Quarters US $ | | Two Satellite Stations (Sakha & Sids) US $ |
|---|---|---|---|---|
| **I. CAPITAL BUDGET** | | | | |
| **A. Repair & Mainenance Shops** | | | | |
| 1. Workshop Construction * & Remodeling. | | 300,000 | | 300,000 |
| 2. Shop repair & Maintenance Equipment | | 300,000 | | 300,000 |
| 3. Mobile equipment & Vehicles : | | | | |
| a) Mobile Workshop for Auto-Tractor & Machinery **. | (1) | Unit | (2) | Unit |
| b) Tow-Trucks with Crane | (1) | 20,000 | | 40,000 |
| c) Mobile Electronic Instument Repair Vans. | (2) | 20,000 | | ----- |
| d) Pick up Trucks-Vans | (2) | 16,000 | (4) | 32,000 |
| 4. Office Furniture &Equipment. | | 10,000 | | 15,000 |

* To supplement Existing ARC shops & stores

** To be provided by ARC

320

| | Giza Head Quarters US $ | Two Satellite Stations (Shakha & Sids) US $ |
|---|---|---|
| **B. Spare Parts Storage** | | |
| 1. Storage remodeling & Construction** | ---- | ---- |
| 2. Storage Shelving & Equipment | 5,000 | 5,000 |
| 3. Computerized Parts Inventory Control System | 15,000 | ----- |
| Total Capital Equipment Budget | 686,000 | 692,000 |

| | | |
|---|---|---|
| <u>Operating Budget</u> | | |
| 1. Material & Supplies | 30,000 | 40.000 |
| 2. Building Manitenance | 10,000 | 10.000 |
| 3. Travel | 50,000 | 40,000 |
| 4. Training ( in country) | 20,000 | --- |
| Total | 110,000 | 90.000 |

| | Giza Head Quarters US $ | Two Satellite Stations (Sakha & Sids) US $ |
|---|---|---|
| **5. ARC/CSU Staff** | | |
| Director | 1 | --- |
| Deputy Director | 1 | 2 |
| Sr. Maintenance Engineers | | |
| 1) Auto Trucks & Machinery | 1 | 2 |
| 2) Electronics & Laboratories | 1 | --- |
| 3) AC & General.Maintenance | 1 | 2 |
| Senior technicians | | |
| 1) Auto Trucks & Machinery | 1 | 2 |
| 2) Electronics & Laboratories | 1 | --- |
| 3) AC & General Maintenance | 1 | 2 |
| Store Manager | 1 | --- |
| Store Keepers | 2 | 2 |
| Store Helpers | 4 | 4 |
| Accountants | 2 | 2 |
| Secretaries | 2 | 2 |
| Drivers | 4 | 4 |
| Janitors | 2 | 2 |
| | 25 | 26 |
| Staff Salaries | 250,000 | 250,000 |
| Total Operating Budget | 360,000 | 340,000 |
| Total (Capital & operating) | $ 1,046,000 | $ 1,032,000 |

322

## III Contract Maintenance Budget & Parts Inventory

| | |
|---|---|
| 1. ARC/CSU spare parts Inventory, Dokki and two sattellite stores. | 1,000,000 |
| 2. ARC Contractual Service & Maintenance* | 3,000,000 |
| Grand Total | US $ 6,000,000 |

1,046,000
1,032,000
1,000,000
3,000,000 ±

$ 6,078,000

* To supplement existing ARC repair & maintenance budget

# APPENDIX II

Scope of Work (1) To serve as a member of a team of service and maintenance experts to develop detailed plans for establishing a major repair and maintenance system, with partial private sector participation for a large National Agricultural Research Organization consisting of many research institutes, experimental stations and other affiliated institutions in Egypt. (2) The repair and maintenance organization to include servicing of automobiles, tractors, farm machines, laboratory equipment, electronic instruments, refrigeration, air-conditioning and other general building maintenance, e.g. mechanical, electrical, plumbing, carpentery mansonry, painting etc. (3) To establish a modern spare parts storage and distribution system with centralized and sattellite stores, computerized inventory controls and procedures, (4) To develop day-to-day operational procedures, documents, contractural arrangements etc for providing first rate repair and maintenance services to a host of client research institutions through private contractor's repair shops located in publicly owned repair and maintenance facilities.

Duration of Assignment : Two Months

Location : Egypt

1. Team Leader & Maintenance Management Specialist

Qualifications:

a. A degree in engineering or related professions with 25 years of working experience.

b. Substantial practical experience in planning and operating major repair and maintenance systems with large institutions such as International agricultural research centers, major research and educational institutions, govt. and military farms, private corporations and other large service institutions.

c. Capability to plan, organize and lead the work of a technical expert team , ability to summarize discussions and prepare reports for presentations to various authorities on repair and maintenance projects.

2. Electronic & Laboratory Equipment Specialist

Qualifications:

a. A degree in electronics or related professions.

b. At least 20 years of working experience preferably in supervisory capacity in repair and maintenance of electronics instrumentation, and laboratory equipment with instrument manufacturers, universities, research institutions, etc.

3. Automobile-Tractor & Farm Machinery Service Specialist

Qualifications

a. A degree in either Mechanical, Automobile, or Agricultural Engineering or any related field.

b, A minimum of 20 years of working experience in supervising repair and maintenance activities with universities, research stations , large agricultural farms, auto machinery dealers etc.

4. Air Conditioning and General Building Maintenance

Qualifications

a. Degree in any engineering field with specialized training in refrigeration and air conditioning.

b. At least 15 years of working experience on service and maintenance. of air conditioning system with large organizations.

# PROGRAMS FOR INCREAING THE EFFECTIVENESS AND EFFICIENCY IN OBTAINING SIGNIFICANT RESEARCH RESULTS AT THE AGRICULTURAL RESEARCH STATIONS

## INTRODUCTION

Egypt's Agricultural Research Stations are a service organization to support agricultural scientists engaged in the production of knowledge, the purpose of which is to improve their ability to solve agricultural and agricultural related problems. For this purpose the Arab Republic of Egypt, and other groups allocate funds that are budgeted to the stations. The stations use these monies during a given year to purchase "inputs" (labor, services, equipment, supplies, etc.) used in "activities" that result in the production of knowledge, the "output" of research activity.

Each research station in Egypt has been strategically located (appendix 1) to solve agricultural problems of the area. Some research stations conduct research on only two or three commodities, while others are located in areas with a wide diversified production of livestock and crops. In applied, or production oriented research of any crop or animal, many different scientific disciplines are utilized to assure success. In the MOA/ARC, many of these disciplines have been divided into logical research units called "Institutes" and "Sections" within Institutes. The research staff in each section is highly trained with individuals specializing in a rather narrow area of study and research. Research staff members from different sections are located either in the Institutes in Cairo or travel to stations or they reside at research stations where they conduct significant research in their specialized discipline. Their research responsibilities may be to solve local production problems and/or to contribute significantly to the overall advancement of scientific knowledge.

Basic research is such a vitally necessary element that it stands by itself as a specific research goal where it undergirds all interdisciplinary research and contributes to the store of new fundamental knowledge. To a modest degree basic research needs to be encouraged and supported at the research stations.

The objectives of the research stations are to provide a desirable environment so scientists can conduct innovative purposeful research. To develop this ideal goal requires many major "inputs" such as: training, commodity purchases, soil-water and land improvement, new and renovation of old facilities, and inspiring motivation.

### Land Preparation (Drainage, Irrigation and Leveling)

Improper water management has been identified as the major factor affecting agricultural productivity in Egypt. Drainage is of immediate importance to reverse the effects of water logging and salinity contamination. Proper and

efficient use of irrigation water is one of the most important management practices needed in Egypt. Soil and water are the basic requirements for conducting plant research in field and horticultural crops. If significant research results are to be obtained from field experiments, productive soils (free from water logging, salinity spots, etc.) and a reliable irrigation system, including good drainage, are necessary.

The land preparation improvement program on the research stations will have three major objectives:

1. To upgrade the research capabilities of the ARC Research stations by providing drainage where necessary and/or to improve existing drainage systems.

2. To improve the irrigation system in order to provide more efficient water management.

3. To maximize yields through proper water management (both irrigation and drainage systems) and improved agronomic practices, such as, gypsum applications, subsoiling, land leveling, etc.

The type of pump stations will vary considerably depending on the location. Some engines and pumps will be free standing in the open air, some in previously built sheds, but the major will be housed in a open sided shed.

It is estimated that the average cost per feddan for land preparation improvement will be approximately $2,300.00. A total of 3500 feddans have been delineated for use strictly for research (see appendix 2). Therefore, the estimated budget for this program is $8,017,500 (3500 feddans @ $2,290.71) In the enclosed budget there is no line item for contingencies. It is assumed that any needed contingency funds will be available through the overall project budget (see appendix 3).

## Communications

Good communication between the research station scientists and their respective sections in Cairo and other research units is of paramount importance. Good telephone service could increase the efficiency of paying bills, posting receipts, and keeping all scientists and administrators informed on the progress of the various research programs.

A survey was made concerning telephone service to 25 of the research station sites. It was found that 5 stations (20%) had no telephone service, 3 stations (12%) service was rated as poor or very poor, and 8 of the stations (32%) service was rated as only fair. Nine stations (36%) reported satisfactory telephone service. Meetings were held with the ARENTO telephone company and research station directors to determine the feasibility and cost of obtaining a telecommunication system, with data transfer capability at selected stations.

It is recommended that a minimum of two national telephone lines be installed at every station. One line will be reserved for only data and computer use transmissions. (See appendix 4 for information about each research station).

The cost of installing the 52 direct national telephone lines and the 27 computer lines is estimated to average $12,000 per line. (79 telephone lines @ $12,000 = $948,000) and three international lines at $15,000 per line. (3 @ $15,000 = $45,000)

Cost of National lines -- $948,000
Cost of International line -- 45,000

Total communication cost -- $983,000

Communication System For Research Stations and Experimental Sections Over All Governorates

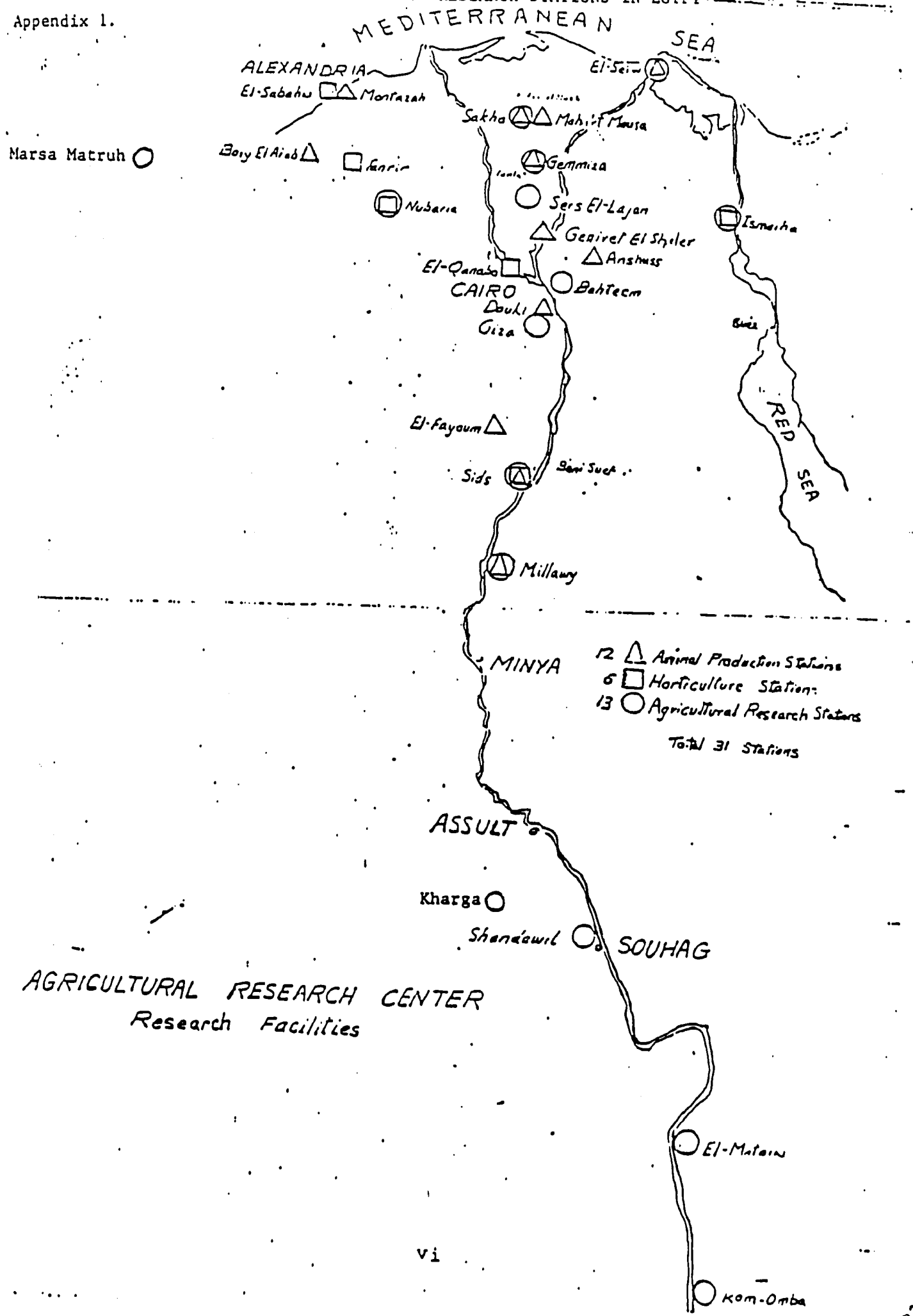
| Governorates | Agric Res, or Experimental Stations | No. of Computer Lines | No. of National Direct Lines | No. of International Lines | No. of Extention Lines in the switch |
|---|---|---|---|---|---|
| Giza | Centers and Institutions | 5 | 10 | 3 | 10 + |
| Qalubia | Bahteem Res. Station<br>Geziret El Shaier Res. Station<br>Kanater Res. Station | 1<br>1<br>1 | 2<br>1<br>2 | 0<br>0<br>0 | 20<br>5<br>10 |
| Gharbia | Gemmeiza Res. Station<br>Zarzora Exp. Section | 1<br>1 | 2<br>1 | 0<br>0 | 10<br>3 |
| Sharkia | Inshass Res. Station<br>Kassasseen Res. Station<br>Zagazik Exp. Section | 1<br>1<br>0 | 1<br>1<br>1 | 0<br>0<br>0 | 5<br>10<br>5 |
| Manufia | Shebeen El Koum Exp Section<br>Serse El Lian Res. Station | 0<br>1 | 1<br>1 | 0<br>0 | 2<br>3 |
| Ismailia | Ismailia Res. Station. | 1 | 3 | 0 | 10 |

| Governorates | Agric. Res, or Experimental Station | No. Of Computer Lines | No. of National Direct Lines | No. Of Inteernational Lines | No. of Extension Lines in the switch |
|---|---|---|---|---|---|
| Sinai | Arish | 0 | 1 | 0 | 3 |
| Alexandria | Noubaria Res. Station<br>Sabahia Res. Station<br>Borg El Arab Res. Station | 1<br>1<br>1 | 3<br>1<br>1 | 0<br>0<br>0 | 10 +<br>10<br>5 |
| Kafr El Shiekh | Mahalet Mousa Res. Station<br>Karada Exp. Section | 1<br>0 | 1<br>1 | 0<br>0 | 5<br>2 |
| Fayoum | Fayoum Exp. Section<br>Fayoum Poultry Res. Station | 1<br>1 | 1<br>1 | 0<br>0 | 5<br>3 |
| Beni Suef | Beni Suef Exp.Section | 0 | 1 | 0 | 3 |
| Menia | Mallawi Res. Station | 1 | 2 | 0 | 10 |
| Sohag | Shandaweel Res. Station<br>Sohag Exp. Section | 1<br>0 | 3<br>1 | 0<br>0 | 10<br>3 |
| Quena | Mataana Res, Station<br>Quena Exp. Section | 1<br>0 | 1<br>1 | 0<br>0 | 5<br>5 |

| Governorates | Agric Res. or Experimental | No. of Compute Lines | No. of National Direct Line | No. of International Lines | No. of Extension lines in the Switch |
|---|---|---|---|---|---|
| Aswan | Komombo Res, Station<br>Aswan Exp. Section | 1<br>0 | 1<br>1 | 0<br>0 | 5<br>3 |
| New Valley | El Kharga Res. Station | 1 | 1 | 0 | 5 |
| Matrouh | Mersa Matrouh Res, Station | 1 | 1 | 0 | 5 |
| Damietta | El Serw Res. Station<br>Damietta Exp. Section | 1<br>0 | 2<br>1 | 0<br>0 | 10<br>3 |

Appendix 1.

LOCATIONS OF RESEARCH STATIONS IN EGYPT






332

appendix 2.

-:-

Research Land Requested by
Each Institute at the various
Research Stations

| Research Stations | Land Area Needed, In Feddans, For Field Crops. | Hort. Crops | Animal prods. | Basins |
|---|---|---|---|---|
| NORTH DELTA | | | | |
| Sakha | | | | |
| Nataf 1 | | | | |
| Nataf 2 | 1000 | | 30 | Nataf 1(1,2, 3,4,5,7,8,10,11,12,13,14) |
| | | | | Nataf 2(1E.,1W,2E,2W,3E,3W,4,5,6,7,8,9,10,11,12,1 |
| El-Serw 1 | 100 | | 20 | |
| Mehalet Mousa | | | 50 | |
| Karada | | | 10 | Part 1 |
| MIDDLE DELTA | | | | |
| Gemmeiza | 300 | | 30 | Gemmeiza(1,2,3,4,10,11,12,13,14) |
| Korasheia | | 20 | | |
| Sirs El Laian | 11 | | | |
| Zarzoura | 40 | 10 | | |
| EAST DELTA | | | | |
| Ismailia | 100 | | | |
| Kassaseen | | 60 | | |
| CAIRO | | | | |
| Bahteem | 100 | 10 | | |
| Geiziret El Shaeir | | 60 | 5 | |
| Kanater | | 70 | | |
| Kaha | | 40 | | |

| Research Stations | Land Area Needed, In Feddans, For Field Crops. | Hort. Crops | Animal Prods. | BASINS |
|---|---|---|---|---|
| FAYOUM | | | | |
| Tamia | 30 | | | |
| Kom-Osheem | | 20 | | |
| ALEXANDRIA | | | | |
| Borg El Arab | | | 7 | |
| Noubaria | 100 | 50 | | 20,21,22,23, Branch 4 Noubaria Farm |
| Sabahia | 15 | 45 | | |
| Tahrir South | | 65 | | |
| El Maamora | | 150 | | |
| El Montazah | | 50 | | 30 Feddan El-Nozha, 20 Feddan Antonyades |
| MIDDLE EGYPT | | | | |
| Sids | 300 | 50 | 30 | 4,5,6,7,9,10,11,12,13,14,16,17, Field crops& Ani Pro & 15,20,18,21,( 1,2,3) Hort. Crops. |
| Malawi | 100 | 15 | 10 | 4,5,7 Field Crops & Animal Prod. 1,7,10,12 Hort. Crops |
| UPPER Egypt | | | | |
| Shandaweel | 200 | 15 | | 7,8,13,14,16 Field Crops. & 4 Hort. Crops |
| Mataana | 100 | 30 | | 1,4,9,12,14Field Crops & 2,25 Hort. Crops |
| Kom Ombo | 100 | | | 1,2,6,7,11,15,16 |
| GIZA | 55 | 15 | | |
| NEW VALLEY | | | | |
| Karjha | 12 | | | Research Station Farm-Karjha |
| rsa Matrouh | 10 | | | 5 Feddans at Foka Farm + 5 Feddan at Al-Kasr Farm-M |
| OTAL | 2673 | 775 | 192 | |
| GRAND TOTAL 3640 | | | | |

| Research Stations | Land Area Needed, In Feddans, For Field Crops. | Hort. Crops | Animal prods. | BASINS |
|---|---|---|---|---|
| FAYOUM | | | | |
| Tamia | 30 | | | |
| Kom-Osheem | | 20 | | |
| ALEXANDRIA | | | | |
| Borg El Arab | | | 7 | |
| Noubaria | 100 | 50 | | 20.21.22.23, Branch 4 Noubaria Farm |
| Sabahia | 15 | 45 | | |
| Tahrir South | | 65 | | |
| El Maamora | | 150 | | |
| El Montazah | | 50 | | 30 Feddan El-Nozha, 20 Feddan Antonyades |
| MIDDLE EGYPT | | | | |
| Sids | 300 | 50 | 30 | 4,5,6,7,9,10,11,12,13,14,16,17, Field crops& Ani & 15,20,18,21,( 1,2,3) Hort. Crops. |
| Malawi | 100 | 15 | 10 | 4,5,7 Field Crops & Animal Prod. 1,7,10,12 Hort. Crops |
| UPPER Egypt | | | | |
| Shandaweel | 200 | 15 | | 7,8,13,14,16 Field Crops. & 4 Hort. Crops |
| Mataana | 100 | 30 | | 1,4,9,12,14Field Crops & 2,25 Hort. Crops |
| Kom Ombo | 100 | | | 1,2,6,7,11,15,16 |
| GIZA | 55 | 15 | | |
| NEW VALLEY | | | | |
| Karjha | 12 | | | Research Station Farm-Karjha |
| Kasr Matrouh | 10 | | | 5 Feddans at Foka Farm + 5 Feddan at Al-Kasr Farm-M |
| TOTAL | 2673 | 775 | 192 | |
| GRAND TOTAL 3640 | | | | |

NATIONAL AGRICULTURAL RESEARCH PROJECT
LAND PREPARATION
Proposed Budget

| LINE ITEMS | NO. OF UNITS | UNIT DESCRIP. | UNIT PRICE | TOTAL PRICE | PHASE 1 | PHASE 2 | PHASE 3 |
|---|---|---|---|---|---|---|---|
| DRAINAGE | | | | | | | |
| Installation of PVC pipe | 3500 | Feddans | 200.00 | 700,000.00 | 200,000.00 | 200,000.00 | 300,000.00 |
| IRRIGATION AND DELIVERY SYSTEM | | | | | | | |
| Pump Stations | 20 | Each | 50,000.00 | 1,000,000.00 | 50,000.00 | 200,000.00 | 750,000.00 |
| Pipe Installation | 3500 | Feddans | 1,500.00 | 5,250,000.00 | 60,000.00 | 1,500,000.00 | 3,690,000.00 |
| Local Procurement | 3500 | Feddans | 230.00 | 805,000.00 | 230,000.00 | 230,000.00 | 345,000.00 |
| LAND IMPROVEMENT | | | | | | | |
| Leveling, subsoiling and gypsum | 3500 | Feddans | 75.00 | 262,500.00 | 75,000.00 | 75,000.00 | 112,500.00 |
| TOTAL | | | | 8,017,500.00 | 615,000.00 | 2,205,000.00 | 5,197,500.00 |

ANNEX N.4

UNITED STATES AGENCY for INTERNATIONAL DEVELOPMENT

CAIRO, EGYPT

October 14, 1986

Dr. Hassan Khedr
Director
NARP Project 263-0152
Ministry of Agriculture

Subject: Construction Work Plan for National Agricultural Research Project 263-0152

Implementation Letter #12

Dear Dr. Khedr:

This will acknowledge receipt of your October 5, 1986 letter (No. 000703) in fulfillment of Section 4.4 "Requirements Precedent to Disbursement for Construction and Renovation" of the subject agreement.

I am pleased to advise you that the documents submitted are accepted by USAID as meeting the requirement of Section 4.4.

To maintain the project impetus, I encourage you to proceed with using GOE funds and procedures to retain an A&E firm(s) to prepare plans, specifications, contracting documents and cost estimates for the works. We look forward in working with you and your staff in scheduling and assuring timely project inputs.

We look forward to successful implementation of ATT project activities.

Sincerely,

William H. Janssen
Associate Director for
Agricultural Resources

337

بسم الله الرحمن الرحيم

Ministry of Agriculture
**National Agricultural Research Project**
Office of the Director

وزارة الزراعة
المشروع القومي للأبحاث الزراعية
مدير المشروع

Mr. Wm. H. Janssen
USAID - CAIRO

October 5, 1986

Dear Mr. Janssen:

Transmitted herewith is the construction Work Plan for the National Agriculture Research Project (NARP). This plan is intended to meet the condition precedent to disbursement for construction and renovation noted in Section 4.4 ..... of the Project Agreement for the NARP project No. 263-0152.

As you will note, the total for this "priority one " is higher than the total budgeted. Actual projects to be funded will be selected from this list, up to the limit of funds available.

GOE funds budgeted for this element of the project will be used to fund A & E services as discussed and agreed to during preparation of the Work Plan. As soon as we are notified the Work Plan is acceptable, we will proceed using GOE procedures to put an A & E firm, possibly more than one, in place to begin preparation of plans, specifications, contracting documents and cost estimates to idenfity suitable projects for funding from the AID budget.

We explored the use of the Fixed Amount Reimbursable(FAR) method of financing and believe it is inappropriate since each project will be a distinct element unlike the others. Also since there are so many unknowns in a "renovation" project, we decided that a unit quantity - unit price contracting method is the only suitable mechanism.

Hoping this plan is acceptable to you...

Best regards

Sincerely,

Hassan A. Khedr

Dr. Hassan Khedr
NARP Director

238

NATIONAL AGRICULTURAL RESEARCH PROJECT ( NARP )
USAID PROJECT NO 263-0152

NARP2

ESTIMATE OF CONSTRUCTION COSTS REQUIRED FOR NARP

| ITEM | NO | COST ESTIMATE ( LE 000) RENOVATION | COMPLETION | NEW CONSTRUCTION | TOTAL |
|---|---|---|---|---|---|
| * AG.RESEARCH STATIONS | 30 | 5957 | 388 | 2236 | 8583 * |
| AGRICULTURE | 15 | 1820 | 231 | 1485 | 3536 |
| HORTICULTURE | 6 | 365 | 155 | 0 | 520 |
| ANIMAL | 9 | 3774 | 2 | 751 | 4527 |
| * AGR.RESEARCH INSTITUTES | 13 | 1980 | 760 | 1820 | 4560 * |
| FIELD CROPS | 1 | 145 | 135 | 5 | 285 |
| COTTON | 1 | 750 | 0 | 250 | 1000 |
| SUGAR CROPS | 1 | 25 | 0 | 40 | 65 |
| HORTICULTURE | 1 | 150 | 150 | 250 | 550 |
| ANIMAL PROD.VERTERINARY | 1 | 300 | 175 | 0 | 475 |
| SERUM & VACCINE PROD. | 1 | 50 | 0 | 280 | 330 |
| GENERATION | 1 | 50 | 0 | 120 | 170 |
| PLANT PROTECTION | 1 | 100 | 200 | 225 | 525 |
| PLANT DISEASES | 1 | 100 | 0 | 0 | 100 |
| LAND & SOILS | 1 | 50 | 0 | 200 | 250 |
| AGR. MACHINERY | 1 | 50 | 100 | 0 | 150 |
| PLANT PROT. & EXEMPTION | 1 | 50 | 0 | 450 | 500 |
| CENTERAL HERBICIDE | 1 | 160 | 0 | 0 | 160 |
| * GREEN HOUSE | | 0 | 0 | 2500 | 2500 * |
| * ON FARM | 38 | 10 | 120 | 570 | 700 * |
| | 38 | 10 | 120 | 570 | 700 |
| * SEEDS | | 500 | 0 | 0 | 500 * |
| * LIBRARY | | 2000 | 0 | 0 | 2000 * |
| ****** TOTAL | | 10447 | 1268 | 7126 | 0 18843 ****** |
| * CONSULTANT | | | | 1000 | 1000 * |
| ****** * GRAND TOTAL | | | | | 19843 ****** * |

NATIONAL AGRICULTURAL RESEARCH PROJECT ( NARP )
USAID PROJECT NO 263 0152

NARPS6

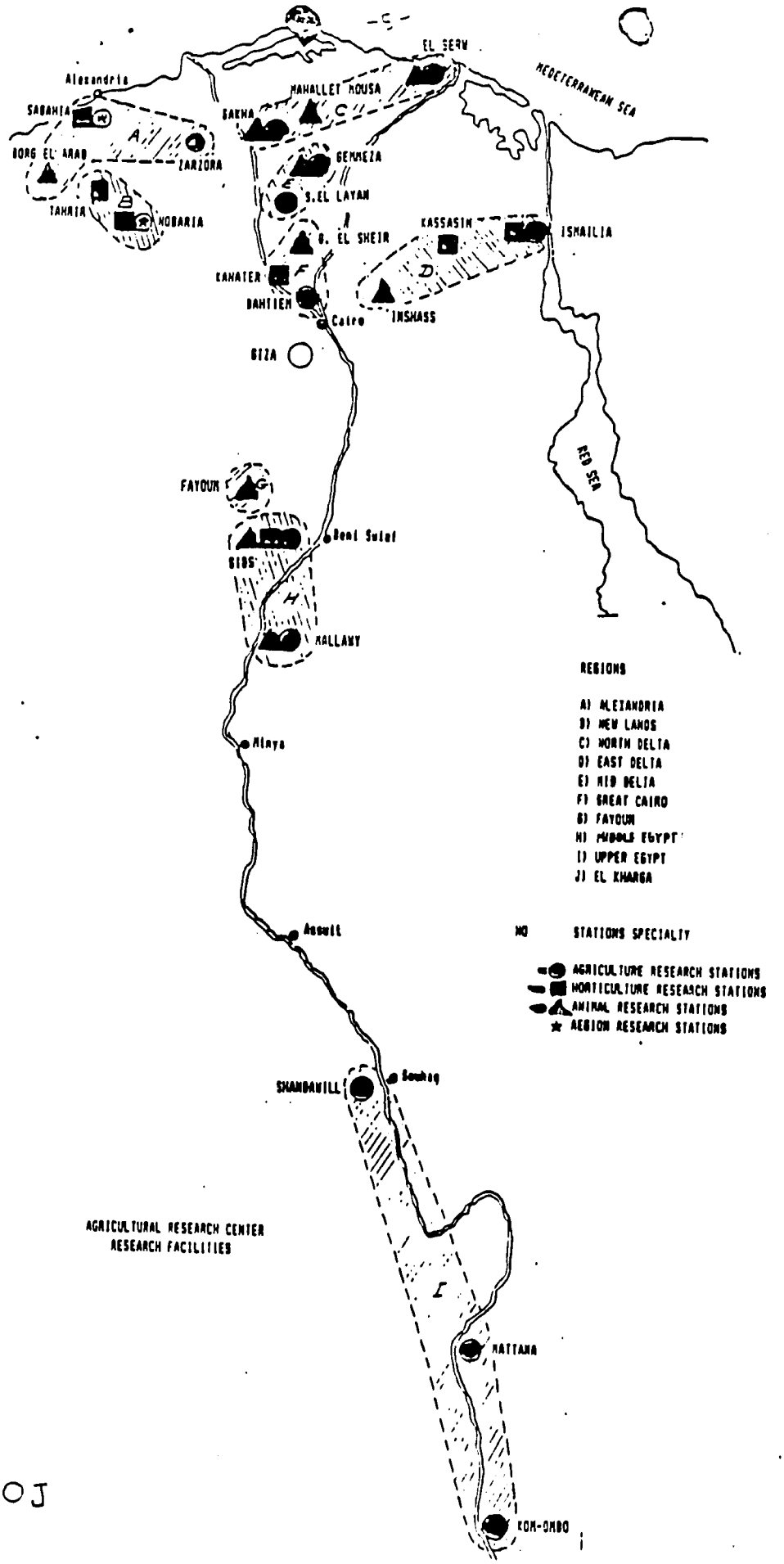
ESTIMATE OF CONSTRUCTION COSTS REQUIRED FOR THE RESEARCH STATIONS

C AGRICULTURAL RESEARCH STATIONS
H HORTICULTURE RESEARCH STATIONS
A ANIMAL RESEARCH STATIONS

R RENOVATION
C COMPLETION
N NEW CONSTRUCTION

| REGION | STATION NAME | AREA ( FEDDAN ) C | H | A | TOTAL | COST ESTIMATE ( LE 000) RENOVATION C | H | A | COMPLETION C | H | A | NEW CONSTRUCTION C | H | A | SUB TOTAL R | C | N | GRAND TOTAL | SPECIALIZATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A ALEXANDRIA | 1) SABAHIA | 15 | 75 | 0 | 90 | 30 | 20 | 0 | 0 | 120 | 0 | 35 | 0 | 0 | 50 | 120 | 35 | 205 | C H • |
| | 2) BORG EL ARAB | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 60 | 30 | 0 | 60 | 90 | • • A |
| B) NEW LANDS | 3) NOBARIA | 100 | 100 | 0 | 200 | 450 | 53 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 503 | 0 | 0 | 503 | C H • |
| | 4) TAHRIR | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 0 | 32 | • H • |
| C) NORTH DELTA | 5) SAKHA & KARDA | 3000 | 0 | 100 | 100 | 340 | 0 | 760 | 0 | 0 | 0 | 35 | 0 | 0 | 1100 | 0 | 35 | 1135 | C • A |
| | 6) MAHALLET MOUSA | 0 | 0 | 100 | 100 | 0 | 0 | 903 | 0 | 0 | 0 | 0 | 0 | 435 | 903 | 0 | 435 | 1338 | • • A |
| | 7) EL SERW | 500 | 0 | 100 | 600 | 0 | 0 | 235 | 60 | 0 | 0 | 100 | 0 | 15 | 235 | 60 | 115 | 410 | C • A |
| D) EAST DELTA | 8) ISMAILIA | 100 | 0 | 0 | 100 | 165 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 165 | 0 | 0 | 165 | C • • |
| | 9) EL KASSASIN | 0 | 170 | 0 | 170 | 0 | 180 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 180 | 0 | 0 | 180 | • H • |
| | 10) IKSHAS | 0 | 0 | 0 | 0 | 0 | 0 | 624 | 0 | 0 | 0 | 0 | 0 | 0 | 624 | 0 | 0 | 624 | • • A |
| E) MID DELTA | 11) EL GERMEZA | 1300 | 100 | 30 | 1430 | 160 | 0 | 990 | 0 | 0 | 0 | 0 | 0 | 0 | 1150 | 0 | 0 | 1150 | C • A |
| | 12) ZARORA | 100 | 0 | 0 | 100 | 50 | 0 | 0 | 0 | 0 | 0 | 150 | 0 | 0 | 50 | 0 | 150 | 200 | C • • |
| | 13) SERS EL LAYAN | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 30 | 0 | 5 | 35 | C • • |
| F) GREAT CAIRO | 14) BAHTIEM | 200 | 0 | 0 | 200 | 180 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 180 | 0 | 100 | 280 | C • • |
| | 15) EL KANATER | 0 | 80 | 0 | 80 | 0 | 60 | 0 | 0 | 35 | 0 | 0 | 0 | 0 | 60 | 35 | 0 | 95 | • H • |
| | 16) GEZERT EL SHEIR | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 5 | 15 | 0 | 5 | 20 | • • A |
| G) FAYOUM | 17) EL FAYOUM | 0 | 0 | 50 | 50 | 0 | 0 | 65 | 0 | 0 | 0 | 0 | 0 | 170 | 65 | 0 | 170 | 235 | • • A |
| H) MIDDLE EGYPT | 18) SIDS | 750 | 90 | 0 | 840 | 154 | 20 | 60 | 0 | 0 | 0 | 0 | 0 | 40 | 234 | 0 | 40 | 274 | C H A |
| | 19) MALLAWY | 200 | 15 | 0 | 215 | 71 | 0 | 92 | 151 | 0 | 2 | 0 | 0 | 26 | 163 | 153 | 26 | 342 | C • A |
| I) UPPER EGYPT | 20) SHANDAWIL | 300 | 0 | 0 | 300 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 100 | C • • |
| | 21) EL MATANA | 100 | 0 | 0 | 100 | 80 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 80 | 0 | 10 | 90 | C • • |
| | 22) KOMOMBO | 100 | 0 | 0 | 100 | 10 | 0 | 0 | 20 | 0 | 0 | 50 | 0 | 0 | 10 | 20 | 50 | 80 | C • • |
| J) EL KHARGA | 23) AL EL GEDEED | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1000 | 0 | 0 | 0 | 0 | 1000 | 1000 | |
| | GRAND TOTAL | 3765 | 630 | 320 | 4715 | 1820 | 365 | 3774 | 231 | 155 | 2 | 1485 | 0 | 751 | 5959 | 388 | 2236 | 8583 | 14•6•10• 30 ST. |
| | ADMINISTRATION | | | | | 700 | 72 | 78 | 60 | 155 | 2 | 0 | 0 | 42 | 850 | 217 | 42 | 1109 | |
| | EQUIPMOUSE | | | | | 105 | 50 | 5 | 20 | 0 | 0 | 35 | 0 | 0 | 160 | 20 | 35 | 215 | |
| | ST & L.HOUSING | | | | | 247 | 21 | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 301 | 0 | 0 | 301 | |
| | ANIMAL HOUSING | | | | | 0 | 10 | 2346 | 0 | 0 | 0 | 0 | 0 | 157 | 2356 | 0 | 157 | 2513 | |
| | [illegible] | | | | | 0 | 0 | 760 | 0 | 0 | 0 | 35 | 0 | 135 | 760 | 0 | 170 | 930 | |
| | [illegible] | | | | | 0 | 0 | 131 | 151 | 0 | 0 | 0 | 0 | 57 | 131 | 151 | 57 | 339 | |
| | [illegible] HOUSE | | | | | 90 | 180 | 72 | 0 | 0 | 0 | 255 | 0 | 105 | 342 | 0 | 360 | 702 | |
| | [illegible] BUILDINGS | | | | | 21 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26 | 0 | 0 | 26 | |
| | [illegible] | | | | | 307 | 20 | 306 | 0 | 0 | 0 | 0 | 0 | 0 | 635 | 0 | 0 | 635 | |
| | [illegible] | | | | | 220 | 7 | 41 | 0 | 0 | 0 | 240 | 0 | 255 | 398 | 0 | 495 | [illegible] | |

240


EL SERW
MEDITERRANEAN SEA
Alexandria
SABAHIA
MAHALLET MOUSA
SAKHA
BORG EL ARAB
ZARIORA
GEMMEZA
S.EL LAYAN
TAHRIA
NOBARIA
KASSASIN
ISMAILIA
B. EL SHEIR
KANATER
BAHTIEM
Cairo
INSHASS
GIZA
RED SEA
FAYOUM
Beni Suief
SIDS
KALLANY
Minya
REGIONS
A) ALEXANDRIA
B) NEW LANDS
C) NORTH DELTA
D) EAST DELTA
E) MID DELTA
F) GREAT CAIRO
G) FAYOUM
H) MIDDLE EGYPT
I) UPPER EGYPT
J) EL KHARGA
Aswan
NO STATIONS SPECIALITY
AGRICULTURE RESEARCH STATIONS
HORTICULTURE RESEARCH STATIONS
ANIMAL RESEARCH STATIONS
REGION RESEARCH STATIONS
SHANDAWILL
Sohag
AGRICULTURAL RESEARCH CENTER
RESEARCH FACILITIES
I
NATTANA
KOM-OMBO

OJ

USAID PROJECT NO 263-0152

ESTIMATE OF CONSTRUCTION COSTS REQUIRED FOR THE RESEARCH STATIONS

C AGRICULTURE RESEARCH STATIONS
H HORTICULTURE RESEARCH STATIONS
A ANIMAL RESEARCH STATIONS

R RENOVATION
C COMPLETION
N NEW CONSTRUCTION

| STATION NAME | AREA (FEDDAN) C | H | A | TOTAL | ITEM DESCRIPTION | COST ESTIMATE (LE 000) RENOVATION C | H | A | COMPLETION C | H | A | NEW CONSTRUCTION C | H | A | SUB TOTAL R | C | N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1) SAKHA | 15 | 75 | | 90 | | 30 | 20 | 0 | 0 | 120 | 0 | 35 | 0 | 0 | 55 | 120 | 35 |
| | | | | | ADMINISTRATION | 16 | 20 | 0 | 0 | 120 | 0 | 0 | 0 | 0 | 16 | 120 | 0 |
| | | | | | GUESTHOUSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | ST.LL.HOUSING | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | ANIMAL HOUSING | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | SHEDS | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 10 |
| | | | | | LABS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | STORES | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 | 25 |
| | | | | | GREEN HOUSE | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 0 |
| | | | | | WATER,E.LS.LINES | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | OTHERS | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 |
| 2) SIDI EL ARAB | | | | | | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 60 | 30 | 0 | 60 |
| | | | | | ADMINISTRATION | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | GUESTHOUSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | ST.LL.HOUSING | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | ANIMAL HOUSING | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 35 | 15 | 0 | 35 |
| | | | | | SHEDS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | LABS | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 |
| | | | | | STORES | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 25 |
| | | | | | GREEN HOUSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | WATER,E.LS.LINES | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 |
| | | | | | OTHERS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3) EL MOHARIA | 100 | 100 | | 200 | | 450 | 53 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 503 | 0 | 0 |
| | | | | | ADMINISTRATION | 20 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 40 | 0 | 0 |
| | | | | | GUESTHOUSE | 12 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27 | 0 | 0 |
| | | | | | ST.LL.HOUSING | 60 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 78 | 0 | 0 |
| | | | | | ANIMAL HOUSING | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | SHEDS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | LABS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | STORES | 10 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 |
| | | | | | GREEN HOUSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | WATER,E.LS.LINES | 110 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 110 | 0 | 0 |
| | | | | | OTHERS | 238 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 238 | 0 | 0 |
| 4) TAMIEH | | | | | | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 0 |
| | | | | | ADMINISTRATION | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 |
| | | | | | GUESTHOUSE | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 |
| | | | | | ST.LL.HOUSING | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 |
| | | | | | ANIMAL HOUSING | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | SHEDS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | LABS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | STORES | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | GREEN HOUSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | WATER,E.LS.LINES | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | OTHERS | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| 5) SAKHA & SARDA | 3000 | | 100 | 3100 | | 340 | 0 | 760 | 0 | 0 | 0 | 35 | 0 | 0 | 1100 | 0 | 35 |
| | | | | | ADMINISTRATION | 30 | 0 | 40 | 0 | 0 | 0 | 0 | 0 | 0 | 70 | 0 | 0 |
| | | | | | GUESTHOUSE | 20 | 0 | 5 | 0 | 0 | 0 | 35 | 0 | 0 | 25 | 0 | 35 |
| | | | | | ST.LL.HOUSING | 50 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 80 | 0 | 0 |
| | | | | | ANIMAL HOUSING | 0 | 0 | 473 | 0 | 0 | 0 | 0 | 0 | 0 | 473 | 0 | 0 |
| | | | | | SHEDS | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 0 |
| | | | | | LABS | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 |
| | | | | | STORES | 30 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 45 | 0 | 0 |
| | | | | | GREEN HOUSE | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 |
| | | | | | WATER,E.LS.LINES | 100 | 0 | 50 | 0 | 0 | 0 | 0 | 0 | 0 | 270 | 0 | 0 |
| | | | | | OTHERS | 20 | 0 | 37 | 0 | 0 | 0 | 0 | 0 | 0 | 57 | 0 | 0 |
| 6) MANZALET MOUSA & SARADA | 0 | | 100 | 100 | | 0 | 0 | 903 | 0 | 0 | 0 | 0 | 0 | 435 | 903 | 0 | 435 |
| | | | | | ADMINISTRATION | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 40 | 0 | 0 | 40 |
| | | | | | GUESTHOUSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | ST.LL.HOUSING | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | ANIMAL HOUSING | 0 | 0 | 203 | 0 | 0 | 0 | 0 | 0 | 65 | 203 | 0 | 65 |
| | | | | | SHEDS | 0 | 0 | 510 | 0 | 0 | 0 | 0 | 0 | 120 | 510 | 0 | 120 |
| | | | | | LABS | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 45 | 10 | 0 | 45 |
| | | | | | STORES | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 30 |
| | | | | | GREEN HOUSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | WATER,E.LS.LINES | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 0 |
| | | | | | OTHERS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 135 | 0 | 0 | 135 |
| 7) EL SERW | 500 | | 100 | 600 | | 0 | 0 | 235 | 60 | 0 | 0 | 100 | 0 | 15 | 235 | 60 | 115 |
| | | | | | ADMINISTRATION | 0 | 0 | 10 | 60 | 0 | 0 | 0 | 0 | 0 | 10 | 60 | 0 |
| | | | | | GUESTHOUSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | ST.LL.HOUSING | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | ANIMAL HOUSING | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | SHEDS | 0 | 0 | 150 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | LABS | 0 | 0 | 60 | 0 | 0 | 0 | 20 | 0 | 15 | 150 | 0 | 35 |
| | | | | | STORES | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 60 | 0 | 0 |
| | | | | | GREEN HOUSE | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 30 |
| | | | | | WATER,E.LS.LINES | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | OTHERS | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 |
| 8) ISMAILIA | 100 | | | 100 | | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 | 50 |
| | | | | | ADMINISTRATION | 165 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 165 | 0 | 0 |
| | | | | | GUESTHOUSE | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 |
| | | | | | ST.LL.HOUSING | 50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 |
| | | | | | ANIMAL HOUSING | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | SHEDS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | LABS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | STORES | 35 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | GREEN HOUSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 35 | 0 | 0 |
| | | | | | WATER,E.LS.LINES | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | OTHERS | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| STATION NAME | AREA (FEDDAN) C | W | A | TOTAL | ITEM DESCRIPTION | COST ESTIMATE (LE 000) RENOVATION C | W | A | COMPLETION C | W | A | NEW CONSTRUCTION C | W | A | SUB TOTAL C | W | A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9) EL CASSASIN | | 170 | | 170 | | 0 | 180 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 180 | 0 | 0 |
| | | | | | ADMINISTRATION | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | GUESTHOUSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | ST.LL.HOUSING | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | ANIMAL HOUSING | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | SHEDS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | LABS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | STORES | 0 | 180 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 180 | 0 | 0 |
| | | | | | GREEN HOUSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | WATER,E.SS.LINES | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | OTHERS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10) INSHAS | | | | | | 0 | 0 | 624 | 0 | 0 | 0 | 0 | 0 | 0 | 624 | 0 | 0 |
| | | | | | ADMINISTRATION | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | GUESTHOUSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | ST.LL.HOUSING | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | ANIMAL HOUSING | 0 | 0 | 594 | 0 | 0 | 0 | 0 | 0 | 0 | 594 | 0 | 0 |
| | | | | | SHEDS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | LABS | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 |
| | | | | | STORES | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | GREEN HOUSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | WATER,E.SS.LINES | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | OTHERS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11) EL GERMEZA | 1300 | | 30 | 1330 | | 160 | 0 | 990 | 0 | 0 | 0 | 0 | 0 | 0 | 1150 | 0 | 0 |
| | | | | | ADMINISTRATION | 160 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 160 | 0 | 0 |
| | | | | | GUEST HOUSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | ST.LL.HOUSING | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | ANIMAL HOUSING | 0 | 0 | 930 | 0 | 0 | 0 | 0 | 0 | 0 | 930 | 0 | 0 |
| | | | | | SHEDS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | LABS | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 |
| | | | | | STORES | 0 | 0 | 45 | 0 | 0 | 0 | 0 | 0 | 0 | 45 | 0 | 0 |
| | | | | | GREEN HOUSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | WATER,E.SS.LINES | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | OTHERS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12) JARIDRA | 100 | | | 100 | | 50 | 0 | 0 | 0 | 0 | 0 | 150 | 0 | 0 | 50 | 0 | 150 |
| | | | | | ADMINISTRATION | 50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 |
| | | | | | GUEST HOUSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | ST.LL.HOUSING | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | ANIMAL HOUSING | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | SHEDS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | LABS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | STORES | 0 | 0 | 0 | 0 | 0 | 0 | 150 | 0 | 0 | 0 | 0 | 150 |
| | | | | | GREEN HOUSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | WATER,E.SS.LINES | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | OTHERS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 13) SERS EL LAYAN | | | | | | 30 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 30 | 0 | 5 |
| | | | | | ADMINISTRATION | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 |
| | | | | | GUEST HOUSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | ST.LL.HOUSING | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | ANIMAL HOUSING | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | SHEDS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | LABS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | STORES | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 5 |
| | | | | | GREEN HOUSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | WATER,E.SS.LINES | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | OTHERS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 14) BANTIER | 200 | | | 200 | | 100 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 100 | 0 | 100 |
| | | | | | ADMINISTRATION | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 0 |
| | | | | | GUEST HOUSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | ST.LL.HOUSING | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | ANIMAL HOUSING | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | SHEDS | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 5 |
| | | | | | LABS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | STORES | 0 | 0 | 0 | 0 | 0 | 0 | 45 | 0 | 0 | 0 | 0 | 45 |
| | | | | | GREEN HOUSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | WATER,E.SS.LINES | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | OTHERS | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 | 50 |
| 15) EL GHATER | | 80 | | 80 | | 0 | 40 | 0 | 0 | 35 | 0 | 0 | 0 | 0 | 40 | 35 | 0 |
| | | | | | ADMINISTRATION | 0 | 0 | 0 | 0 | 35 | 0 | 0 | 0 | 0 | 0 | 35 | 0 |
| | | | | | GUEST HOUSE | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 |
| | | | | | ST.LL.HOUSING | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | ANIMAL HOUSING | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 |
| | | | | | SHEDS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | LABS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | STORES | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | GREEN HOUSE | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 |
| | | | | | WATER,E.SS.LINES | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 |
| | | | | | OTHERS | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 |
| 16) BEZEBT EL SHEIR | | | | | | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 |
| | | | | | ADMINISTRATION | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | GUEST HOUSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | ST.LL.HOUSING | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | ANIMAL HOUSING | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | SHEDS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | LABS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | STORES | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | GREEN HOUSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | WATER,E.SS.LINES | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | OTHERS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

COST ESTIMATE (LE 000)

| STATION NAME | AREA (FEDDAN) C | H | A | TOTAL | ITEM DESCRIPTION | RENOVATION C | H | A | COMPLETION C | H | A | NEW CONSTRUCTION C | H | A | SUB TOTAL C | H | A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (17) EL FAYOUM | 0 | 0 | 50 | 50 | | 0 | 0 | 65 | 0 | 0 | 0 | 0 | 0 | 170 | 65 | 0 | 170 |
| | | | | | ADMINISTRATION | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 |
| | | | | | GUEST HOUSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | ST.SL.HOUSING | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | ANIMAL HOUSING | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | SHEDS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | LABS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | STORES | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 50 |
| | | | | | GREEN HOUSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | WATER,E.SS.LINES | 0 | 0 | 50 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 |
| | | | | | OTHERS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 120 | 0 | 0 | 120 |
| (18) SIDS | 750 | 10 | 50 | 810 | | 154 | 20 | 60 | 0 | 0 | 0 | 0 | 0 | 40 | 234 | 0 | 40 |
| | | | | | ADMINISTRATION | 30 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 |
| | | | | | GUEST HOUSE | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 |
| | | | | | ST.SL.HOUSING | 64 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 64 | 0 | 0 |
| | | | | | ANIMAL HOUSING | 0 | 0 | 60 | 0 | 0 | 0 | 0 | 0 | 40 | 60 | 0 | 40 |
| | | | | | SHEDS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | LABS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | STORES | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 |
| | | | | | GREEN HOUSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | WATER,E.SS.LINES | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | OTHERS | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 |
| (19) AKLANY | 200 | 0 | 15 | 215 | | 71 | 0 | 92 | 151 | 0 | 2 | 0 | 0 | 26 | 163 | 153 | 26 |
| | | | | | ADMINISTRATION | 14 | 0 | 10 | 0 | 0 | 2 | 0 | 0 | 2 | 24 | 2 | 2 |
| | | | | | GUEST HOUSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | ST.SL.HOUSING | 23 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 26 | 0 | 0 |
| | | | | | ANIMAL HOUSING | 0 | 0 | 65 | 0 | 0 | 0 | 0 | 0 | 12 | 65 | 0 | 12 |
| | | | | | SHEDS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | LABS | 0 | 0 | 0 | 151 | 0 | 0 | 0 | 0 | 12 | 0 | 151 | 12 |
| | | | | | STORES | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 |
| | | | | | GREEN HOUSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | WATER,E.SS.LINES | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 0 | 0 |
| | | | | | OTHERS | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 0 |
| (20) SHAKHAWIL | 300 | 0 | 0 | 300 | | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 0 |
| | | | | | ADMINISTRATION | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 |
| | | | | | GUEST HOUSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | ST.SL.HOUSING | 50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 |
| | | | | | ANIMAL HOUSING | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | SHEDS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | LABS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | STORES | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | GREEN HOUSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | WATER,E.SS.LINES | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | OTHERS | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 |
| (21) EL NATANA | 100 | 50 | 0 | 150 | | 80 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 80 | 0 | 10 |
| | | | | | ADMINISTRATION | 80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 80 | 0 | 0 |
| | | | | | GUESTHOUSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | ST.SL.HOUSING | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | ANIMAL HOUSING | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | SHEDS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | LABS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | STORES | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | GREEN HOUSING | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | WATER,E.SS.LINES | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | OTHERS | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 10 |
| (22) KOMOMBO | 100 | 0 | 0 | 100 | | 10 | 0 | 0 | 20 | 0 | 0 | 50 | 0 | 0 | 10 | 20 | 50 |
| | | | | | ADMINISTRATION | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 |
| | | | | | GUEST HOUSE | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 |
| | | | | | ST.SL.HOUSING | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | ANIMAL HOUSING | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | SHEDS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | LABS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | STORES | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | GREEN HOUSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | WATER,E.SS.LINES | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | OTHERS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (23) W.EL BEDEED | 3765 | 630 | 380 | 4775 | | 0 | 0 | 0 | 0 | 0 | 0 | 1000 | 0 | 0 | 0 | 0 | 1000 |
| | | | | | ADMINISTRATION | 0 | 0 | 0 | 0 | 0 | 0 | 1000 | 0 | 0 | 0 | 0 | 1000 |
| | | | | | GUEST HOUSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | ST.SL.HOUSING | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | ANIMAL HOUSING | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | SHEDS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | LABS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | STORES | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | GREEN HOUSE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | WATER,E.SS.LINES | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | OTHERS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| IRRAG TOTAL | | | | | | 1820 | 365 | 3774 | 231 | 155 | 2 | 1485 | 0 | 751 | 5959 | 388 | 2224 |
| | | | | | ADMINISTRATION | 700 | 72 | 70 | 60 | 155 | 2 | 0 | 0 | 42 | 850 | 217 | 42 |
| | | | | | GUESTHOUSE | 105 | 50 | 5 | 20 | 0 | 0 | 15 | 0 | 0 | 160 | 20 | 15 |
| | | | | | ST.SL.HOUSING | 247 | 21 | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 281 | 0 | 0 |
| | | | | | ANIMAL HOUSING | 0 | 10 | 2246 | 0 | 0 | 0 | 0 | 0 | 157 | 2256 | 0 | 157 |
| | | | | | SHEDS | 0 | 0 | 160 | 0 | 0 | 0 | 15 | 0 | 115 | 160 | 0 | 115 |
| | | | | | LABS | 0 | 0 | 131 | 151 | 0 | 0 | 0 | 0 | 57 | 131 | 151 | 57 |
| | | | | | STORES | 49 | 180 | 72 | 0 | 0 | 0 | 225 | 0 | 155 | 242 | 0 | 380 |
| | | | | | GREEN HOUSE | 21 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26 | 0 | 0 |
| | | | | | WATER,E.SS.LINES | 307 | 20 | 250 | 0 | 0 | 0 | 0 | 0 | 0 | 635 | 0 | 0 |
| | | | | | OTHERS | 350 | 7 | 41 | 0 | 0 | 0 | 140 | 0 | 225 | 398 | 0 | 415 |

344

ESTIMATE CONSTRUCTION COSTS REQUIRED FOR RESEARCH INSTITUTS

| INSTITUTES | ITEM DISCRIPTION | LOCATION | COST ESTIMATE (LE 000) RENOVATION | COMPLETION | NEW CONSTRUCTION | TOTAL |
|---|---|---|---|---|---|---|
| 1) FIELD CROPS | | | 145 | 135 | 5 | 285 |
| | LABS 25 | GIZA | 25 | 0 | 0 | 25 |
| | GREENHOUSE 2 | .... | 10 | 0 | 0 | 10 |
| | STORES | .... | 0 | 0 | 5 | 5 |
| | SECOND FLOOR | .... | 0 | 60 | 0 | 60 |
| | SECOND FLOOR | .... | 0 | 75 | 0 | 75 |
| | WORK SHOP | .... | 50 | 0 | 0 | 50 |
| | FARM EQUP.SHED | .... | 25 | 0 | 0 | 25 |
| | ONION&MAIZE STORE | .... | 25 | 0 | 0 | 25 |
| | LIMBER STATION | .... | 10 | 0 | 0 | 10 |
| 2) COTTON | | | 750 | 0 | 250 | 1000 |
| | LABS 12 | GIZA | 0 | 0 | 200 | 200 |
| | STORES 2 | .... | 0 | 0 | 50 | 50 |
| | | SAKHA | 750 | 0 | 0 | 750 |
| 3) SUGER CROPS | | | 25 | 0 | 40 | 65 |
| | COOLING ROOMS | GIZA | 0 | 0 | 40 | 40 |
| | GREENHOUSE | SABAHIA | 15 | 0 | 0 | 15 |
| | | .... | 10 | 0 | 0 | 10 |
| 4) HORTICULTURE | | | 150 | 150 | 250 | 550 |
| | SECOND FLOOR | GIZA | 0 | 100 | 0 | 100 |
| | LABS | .... | 0 | 0 | 150 | 150 |
| | WOODEN TREES | .... | 0 | 0 | 50 | 50 |
| | SECOND FLOOR | .... | 0 | 50 | 0 | 50 |
| | STORS VEG. | DOKI | 0 | 0 | 25 | 25 |
| | STORE | GIZA | 0 | 0 | 25 | 25 |
| | 7 RENOVATION | .... | 150 | 0 | 0 | 150 |
| 5)ANIMAL PRODUCTION | | | 300 | 175 | 0 | 475 |
| | W.,E.&GAS LINE | GIZA | 100 | 0 | 0 | 100 |
| | | .... | 50 | 0 | 0 | 50 |
| | 7 RENOVATION | | 50 | 0 | 0 | 50 |
| | LABS FIRE PROICTION | .... | 100 | 0 | 0 | 100 |
| | STORS | .... | 0 | 25 | 0 | 25 |
| | SECOND FLOOR LAB | .... | 0 | 50 | 0 | 50 |
| | STORES | B.BARRAGE | 0 | 50 | 0 | 50 |
| | | .... | 0 | 50 | 0 | 50 |
| 6) SERUM & VACCINE PRO. | | | 50 | 0 | 280 | 330 |
| | STABLS 3 | CAIRO | 50 | 0 | 0 | 50 |
| | LABS 2 | .... | 0 | 0 | 200 | 200 |
| | STORES 3 | .... | 0 | 0 | 80 | 80 |
| 7) GENERATION | | | 50 | 0 | 120 | 170 |
| | 7 RENOVATION | | 50 | 0 | 0 | 50 |
| | LABS 12 | | 0 | 0 | 100 | 100 |
| | SHEEP STABLES | | 0 | 0 | 10 | 10 |
| | CAW&SHEEP SHEDS | | 0 | 0 | 10 | 10 |
| 8) PLANT PROTECTION | | | 100 | 200 | 225 | 525 |
| | W.&E.RENOVATION | GIZA | 15 | 0 | 0 | 15 |
| | FENCE (ABO HIGHT) | .... | 0 | 3 | 0 | 3 |
| | SECOND FLOOR | .... | 20 | 0 | 0 | 20 |
| | SILK DEP. | GIZA | 5 | 0 | 0 | 5 |
| | SILK M.B. | B.BARRAGE | 50 | 0 | 0 | 50 |
| | | GIZA | 5 | 0 | 0 | 5 |
| | SEC.&THERD FLOOR | .... | 0 | 200 | 0 | 200 |
| | LAB 3 FLOOR | .... | 0 | 0 | 100 | 100 |
| | LAB | SABAHIA | 0 | 0 | 50 | 50 |
| | LAB | .... | 0 | 0 | 75 | 75 |
| 9)PLANT DISEASES | | | 100 | 0 | 0 | 100 |
| | AUTO LIGHT CONTROL | | 50 | 0 | 0 | 50 |
| | 7 RENOVATION | | 50 | 0 | 0 | 50 |
| 10) LAND &SOILS | | | 50 | 0 | 200 | 250 |
| | 7 RENOVATION | | 50 | 0 | 0 | 50 |
| | LABS 15 | | 0 | 0 | 170 | 170 |
| | STORES | | 0 | 0 | 30 | 30 |
| 11) AGR. MACHINERY | | | 50 | 100 | 0 | 150 |
| | TRACTOR LAB TEST | ALEX | 50 | 0 | 0 | 50 |
| | LAB TEST | .... | 0 | 100 | 0 | 100 |
| 12) AGR. ECONOMICS | | | 0 | 0 | 0 | 0 |
| | INSTITUTE | GIZA | 0 | 0 | 0 | 0 |
| 13) EXT.&RURAL DEV. | | | 0 | 0 | 0 | 0 |
| | INSTITUTE | | 0 | 0 | 0 | 0 |
| 14) PLANT PROT.&EXEMPTION | | | 50 | 0 | 450 | 500 |
| | 7 RENOVATION | ALEX | 50 | 0 | | 50 |
| | LABS | .... | | | 450 | 450 |
| 15) CENTERAL HERBICIDE LAB | | | 140 | 0 | 0 | 140 |
| | GREENHOUSE | GIZA | 50 | 0 | 0 | 50 |
| | LABS 12 | | 100 | 0 | 0 | 100 |
| | STORES | | 10 | 0 | 0 | 10 |

NATIONAL AGRICULTURE RESEARCH PROJECT ( NARP)
USAID PROJECT NO 263-0152

ESTIMATE OF CONSTRUCTION COST REQUIRED FOR ON FARM

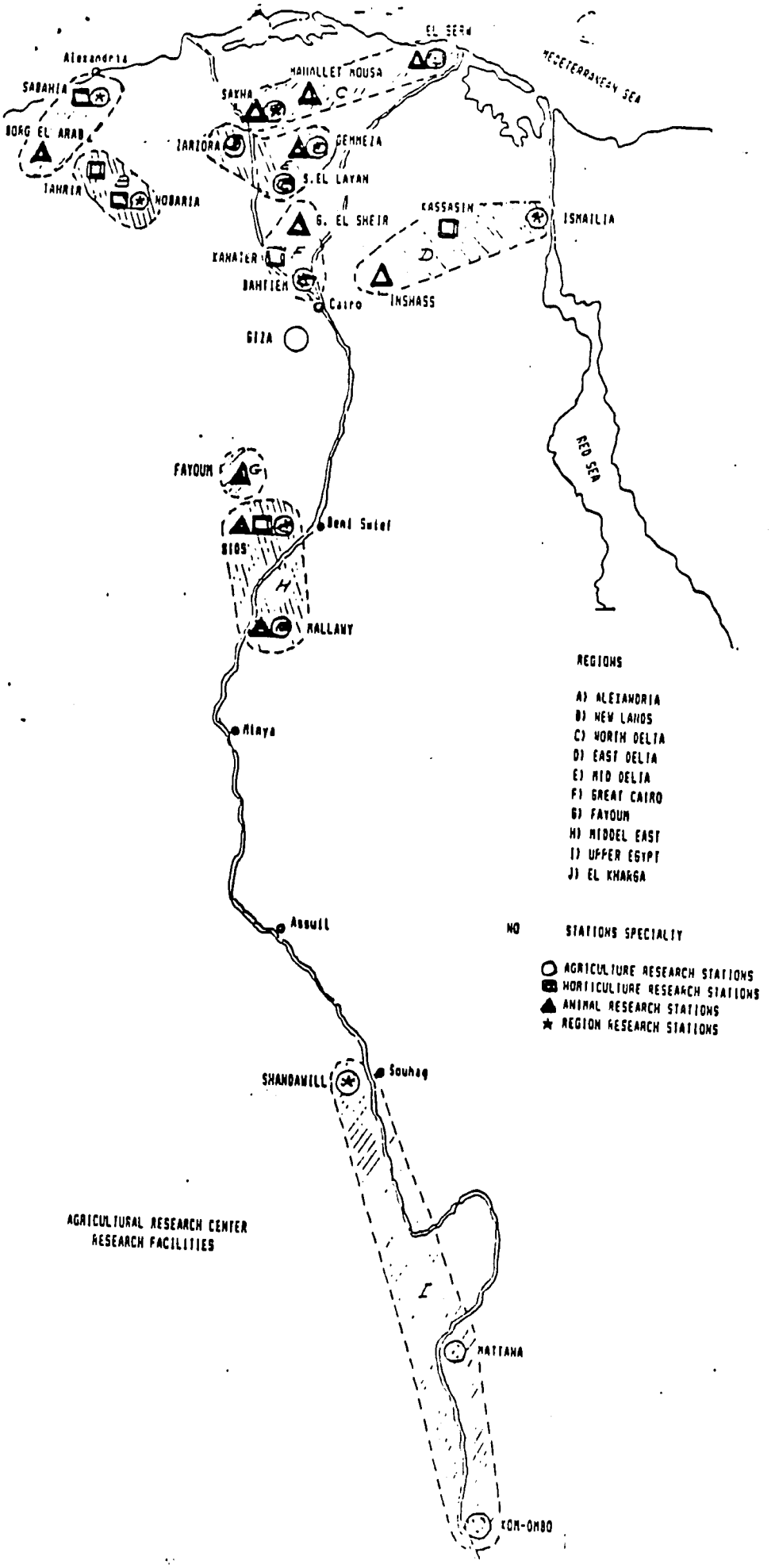
| SITE | ITEM DISCRIPTION | AREA M2 | COST ESTIMATE ( LE 000) RENOVATION | COMPLETION | NEW CONSTRUCTION | TOTAL |
|---|---|---|---|---|---|---|
| 1) KAFER EL SHEKH | STORE AND GARAGE | 150 | 0 | 22.5 | 0 | 22.5 |
| 2) GIZA | STORES, GARAGE AND OFFICE | 150 | 0 | 22.5 | 0 | 22.5 |
| 3) FAYOUM | ONE FLOOR | 100 | 5 | 15 | 0 | 20 |
| | | | | | 0 | 0 |
| 4) BENI SWIFF | ONE FLOOR | 150 | 0 | 22.5 | 0 | 22.5 |
| 5) EL MENIA | ONE FLOOR | 100 | 5 | 15 | 0 | 20 |
| | | | | | 0 | 0 |
| 6) ASWAN | ONE FLOOR | 150 | 0 | 22.5 | 0 | 22.5 |
| | TOTAL | 800 | 10 | 120 | 0 | 130 * |
| 1) ALEXANDRIA | | 300 | 0 | 0 | 45 | 45 |
| 2) EL GHARBIA | | 300 | 0 | 0 | 45 | 45 |
| 3) EL DELENGAT -KOM HAMADA | | 200 | 0 | 0 | 30 | 30 |
| 4) ASHMON - TALA | | 200 | 0 | 0 | 30 | 30 |
| 5) EL SANTA -KETOR | | 200 | 0 | 0 | 30 | 30 |
| 6) BEILA -DESOK | | 200 | 0 | 0 | 30 | 30 |
| 7) FARASKOR -KAFER SSAAD | | 200 | 0 | 0 | 30 | 30 |
| 8) MEET GHAMER -DEKERNES | | 200 | 0 | 0 | 30 | 30 |
| 9) FAIED -EL KASSASIN | | 200 | 0 | 0 | 30 | 30 |
| 10) FAKOS -ABOU KEBIER | | 200 | 0 | 0 | 30 | 30 |
| 11) KAFER SHOKER -EL KANATER | | 200 | 0 | 0 | 30 | 30 |
| 12) EL SAFF - EL BADRASHEEN | | 200 | 0 | 0 | 30 | 30 |
| 13) TAMIA -ATSA | | 200 | 0 | 0 | 30 | 30 |
| 14) EL WASTA -BEBA | | 200 | 0 | 0 | 30 | 30 |
| 15) MALLAWY -SAMALOT | | 200 | 0 | 0 | 30 | 30 |
| 16) EL KOSA - SEDFA | | 200 | 0 | 0 | 30 | 30 |
| 17) EL MENSHA -SAKALTA | | 200 | 0 | 0 | 30 | 30 |
| 18) LUXOR | | 100 | 0 | 0 | 15 | 15 |
| 19) ASWAN | | 100 | 0 | 0 | 15 | 15 |
| | TOTAL | 3800 | 0 | 0 | 570 | 570 * |
| | GRAND TOTAL | | 10 | 120 | 570 | 700 ** |

NATIONAL AGRICULTURAL RESEARCH PROJECT ( NARP ) NARP2

USAID PROJECT NO 263-0152

ESTIMATE OF CONSTRUCTION COSTS REQUIRED FOR NARP

| ITEM | NO | COST ESTIMATE ( 1000 LE ) RENOVATION | COMPLETION | NEW CONSTRUCTION | TOTAL | |
|---|---|---|---|---|---|---|
| * AG.RESEARCH STATIONS | 30 | 6,059.00 | 388.00 | 2,348.00 | 8,795.00 | * |
| AGRICULTURE | 15 | 1,920.00 | 231.00 | 1,597.00 | 3,748.00 | |
| HORTICULTURE | 6 | 365.00 | 155.00 | 0.00 | 520.00 | |
| ANIMAL | 9 | 3,774.00 | 2.00 | 751.00 | 4,527.00 | |
| * AGR.RESEARCH INSTITUTES | 15 | 2,130.00 | 760.00 | 2,040.00 | 4,930.00 | * |
| FIELD CROPS | 1 | 145.00 | 135.00 | 5.00 | 285.00 | |
| COTTON | 1 | 750.00 | 0.00 | 250.00 | 1,000.00 | |
| SUGAR CROPS | 1 | 25.00 | 0.00 | 40.00 | 65.00 | |
| HORTICULTURE | 1 | 150.00 | 150.00 | 250.00 | 550.00 | |
| ANIMAL PROD.VERTERINARY | 1 | 300.00 | 175.00 | 0.00 | 475.00 | |
| ANIMAL'S HEALTH | 1 | 150.00 | 0.00 | 150.00 | 300.00 | |
| ANIMAL'S FEEDING | 1 | 0.00 | 0.00 | 70.00 | 70.00 | |
| SERUM & VACCINE PROD. | 1 | 50.00 | 0.00 | 280.00 | 330.00 | |
| GENERATION | 1 | 50.00 | 0.00 | 120.00 | 170.00 | |
| PLANT PROTECTION | 1 | 100.00 | 200.00 | 225.00 | 525.00 | |
| PLANT DISEASES | 1 | 100.00 | 0.00 | 0.00 | 100.00 | |
| LAND & SOILS | 1 | 50.00 | 0.00 | 200.00 | 250.00 | |
| AGR. MACHINERY | 1 | 50.00 | 100.00 | 0.00 | 150.00 | |
| PLANT PROT. & EXEMPTION | 1 | 50.00 | 0.00 | 450.00 | 500.00 | |
| CENTERAL HERBICIDE | 1 | 160.00 | 0.00 | 0.00 | 160.00 | |
| * GREEN HOUSE | | 0.00 | 0.00 | 2,500.00 | 2,500.00 | * |
| * ON FARM | 38 | 10.00 | 120.00 | 570.00 | 700.00 | * |
| | 38 | 10.00 | 120.00 | 570.00 | 700.00 | |
| * SEEDS | | 500.00 | 0.00 | 0.00 | 500.00 | * |
| * LIBRARY | | 2,000.00 | 0.00 | 0.00 | 2,000.00 | * |
| ****** TOTAL | | 10,699.00 | 1,268.00 | 7,458.00 | 0.00 19,425.00 | ****** |
| @ CONSULTANT | | | | 1,000.00 | 1,000.00 | @ |
| ****** @ GRAND TOTAL | | | | | 20,425.00 | ****** @ |


Alexandria
SABAHIA
BORG EL ARAB
TAHRIR
NOBARIA
SAKHA
MAHALLET MOUSA
EL SERW
MEDITERRANEAN SEA
TANTORA
GEMMEZA
S.EL LAYAN
G. EL SHEIR
KASSASIN
ISMAILIA
KANATER
BAHTIEM
Cairo
INSHASS
GIZA
FAYOUM
Beni Suief
BIOS
MALLAWY
RED SEA
Minya
Assuit
SHANDAWILL
Sohag
MATTANA
KOM-OMBO
REGIONS
A) ALEXANDRIA
B) NEW LANDS
C) NORTH DELTA
D) EAST DELTA
E) MID DELTA
F) GREAT CAIRO
G) FAYOUM
H) MIDDEL EAST
I) UPPER EGYPT
J) EL KHARGA
NO STATIONS SPECIALTY
AGRICULTURE RESEARCH STATIONS
HORTICULTURE RESEARCH STATIONS
ANIMAL RESEARCH STATIONS
REGION RESEARCH STATIONS
AGRICULTURAL RESEARCH CENTER
RESEARCH FACILITIES

NATIONAL AGRICULTURAL RESEARCH PROJECT ( NARP )
USAID PROJECT NO 263-0152

NARP56

ESTIMATE OF CONSTRUCTION COSTS REQUIRED FOR THE RESEARCH STATIONS

C AGRICULTURAL RESEARCH STATIONS
H HORTICULTURE RESEARCH STATIONS
A ANIMAL RESEARCH STATIONS

R RENOVATION
C COMPLETION
N NEW CONSTRUCTION

| REGION | STATION NAME | AREA ( FEDDAN ) C | H | A | TOTAL | COST ESTIMATE ( 1000 LE ) RENOVATION C | H | A | COPLETION C | H | A | NEW COSTRUCTION C | H | A | SUB TOTAL R | C | N | GRAND TOTAL | SPECIALIZATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A) ALEXANDRIA | 1) SABAHIA | 15 | 75 | 0 | 90 | 30.00 | 20.00 | 0.00 | 0.00 | 120.00 | 0.00 | 35.00 | 0.00 | 0.00 | 50.00 | 120.00 | 35.00 | 205.00 | C H • |
| | 2) BORG EL ARAB | 0 | 0 | 0 | 0 | 0.00 | 0.00 | 30.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 60.00 | 30.00 | 0.00 | 60.00 | 90.00 | • • A |
| B) NEW LANDS | 3) NOBARIA | 100 | 100 | 0 | 200 | 450.00 | 53.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 503.00 | 0.00 | 0.00 | 503.00 | C H • |
| | 4) TAHRIR | 0 | 65 | 0 | 65 | 0.00 | 32.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 32.00 | 0.00 | 0.00 | 32.00 | • H • |
| C) NORTH DELTA | 5) SAKHA & KARDA | 3000 | 30 | 100 | 3130 | 340.00 | 0.00 | 760.00 | 0.00 | 0.00 | 0.00 | 35.00 | 0.00 | 0.00 | 1,100.00 | 0.00 | 35.00 | 1,135.00 | C • A |
| | 6) MAHALLET MOUSA | 0 | 0 | 100 | 100 | 0.00 | 0.00 | 903.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 435.00 | 903.00 | 0.00 | 435.00 | 1,338.00 | • • A |
| | 7) EL SERW | 500 | 0 | 100 | 600 | 0.00 | 0.00 | 235.00 | 60.00 | 0.00 | 0.00 | 100.00 | 0.00 | 15.00 | 235.00 | 60.00 | 115.00 | 410.00 | C • |
| D) EAST DELTA | 8) ISMAILIA | 100 | 0 | 0 | 100 | 165.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 165.00 | 0.00 | 0.00 | 165.00 | C • • |
| | 9) EL KASSASIN | 0 | 170 | 0 | 170 | 0.00 | 180.00 | 0.00 | 0.00 | 0.00 | 0.00 | 12.00 | 0.00 | 0.00 | 180.00 | 0.00 | 12.00 | 192.00 | • H • |
| | 10) INSHAS | 0 | 30 | 0 | 30 | 0.00 | 0.00 | 624.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 624.00 | 0.00 | 0.00 | 624.00 | • • A |
| E) MID DELTA | 11) EL GEMMEZA | 1300 | 100 | 30 | 1430 | 160.00 | 0.00 | 990.00 | 0.00 | 0.00 | 0.00 | 100.00 | 0.00 | 0.00 | 1,150.00 | 0.00 | 100.00 | 1,250.00 | C • A |
| | 12) ZARORA | 100 | 10 | 0 | 110 | 50.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 150.00 | 0.00 | 0.00 | 50.00 | 0.00 | 150.00 | 200.00 | C • • |
| | 13) SERS EL LAYAN | 0 | 0 | 0 | 0 | 30.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 5.00 | 0.00 | 0.00 | 30.00 | 0.00 | 5.00 | 35.00 | C • • |
| F) GREAT CAIRO | 14) BAHTIEM | 200 | 10 | 0 | 210 | 180.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 | 0.00 | 0.00 | 180.00 | 0.00 | 100.00 | 280.00 | C • • |
| | 15) EL KANATER | 0 | 80 | 0 | 80 | 0.00 | 60.00 | 0.00 | 0.00 | 35.00 | 0.00 | 0.00 | 0.00 | 0.00 | 60.00 | 35.00 | 0.00 | 95.00 | • H • |
| | 16) GEZERT EL SHEIR | 0 | 0 | 0 | 0 | 0.00 | 0.00 | 15.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 5.00 | 15.00 | 0.00 | 5.00 | 20.00 | • • A |
| G) FAYOUM | 17) EL FAYOUM | 0 | 0 | 0 | 0 | 0.00 | 0.00 | 65.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 170.00 | 65.00 | 0.00 | 170.00 | 235.00 | • • A |
| H) MIDDEL EGYPT | 18) SIDS | 750 | 90 | 50 | 890 | 154.00 | 20.00 | 60.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 40.00 | 234.00 | 0.00 | 40.00 | 274.00 | C H A |
| | 19) MALLAWY | 200 | 15 | 10 | 225 | 71.00 | 0.00 | 92.00 | 151.00 | 0.00 | 2.00 | 0.00 | 0.00 | 26.00 | 163.00 | 153.00 | 26.00 | 342.00 | C • A |
| I) UPPER EGYPT | 20) SHANDAWIL | 300 | 15 | 0 | 0 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 | 0.00 | 0.00 | 100.00 | C • • |
| | 21) EL MATAWA | 100 | 50 | 0 | 0 | 80.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.00 | 0.00 | 0.00 | 80.00 | 0.00 | 10.00 | 90.00 | C • • |
| | 22) KOMOMBO | 100 | 0 | 0 | 0 | 10.00 | 0.00 | 0.00 | 20.00 | 0.00 | 0.00 | 50.00 | 0.00 | 0.00 | 10.00 | 20.00 | 50.00 | 80.00 | C • • |
| J) EL KHARGA | 23) N.EL GEDEED | 0 | 0 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | [illegible] | 1,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1,000.00 | 1,000.00 | |
| | GRAND TOTAL | 6765 | 840 | 390 | 7995 | 1,820.00 | 365.00 | 3,774.00 | 231.00 | 155.00 | 2.00 | 1,597.00 | 0.00 | 751.00 | 5,959.00 | 388.00 | 2,342.00 | 8,695.00 | 14•6•10= 30 ST. |
| AHC ADMINISTRATION BLG. ( RENOVATION ) | | | | | | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 | 0.00 | 0.00 | 100.00 | |
| | ADMINISTRATION | | | | | 700.00 | 72.00 | 78.00 | 60.00 | 155.00 | 2.00 | 0.00 | 0.00 | 42.00 | 850.00 | 217.00 | 42.00 | 1,109.00 | |
| | GUESTHOUSE | | | | | 105.00 | 50.00 | 5.00 | 20.00 | 0.00 | 0.00 | 35.00 | 0.00 | 0.00 | 160.00 | 20.00 | 35.00 | 215.00 | |
| | ST.& L.HOUSING | | | | | 247.00 | 21.00 | 33.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 301.00 | 0.00 | 0.00 | 301.00 | |
| | ANIMAL HOUSING | | | | | 0.00 | 10.00 | 2,346.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 157.00 | 2,356.00 | 0.00 | 157.00 | 2,513.00 | |
| | SHEDS | | | | | 0.00 | 0.00 | 760.00 | 0.00 | 0.00 | 0.00 | 35.00 | 0.00 | 135.00 | 760.00 | 0.00 | 170.00 | 930.00 | |
| | LABS | | | | | 0.00 | 0.00 | 131.00 | 151.00 | 0.00 | 0.00 | 0.00 | 0.00 | 57.00 | 131.00 | 151.00 | 57.00 | 339.00 | |
| | STORES | | | | | 90.00 | 180.00 | 72.00 | 0.00 | 0.00 | 0.00 | 255.00 | 0.00 | 105.00 | 342.00 | 0.00 | 360.00 | 702.00 | |
| | GREEN HOUSE | | | | | 21.00 | 5.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 26.00 | 0.00 | 0.00 | 26.00 | |
| | WATER,E. &S.LINES | | | | | 307.00 | 20.00 | 308.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 635.00 | 0.00 | 0.00 | 635.00 | |
| | OTHERS | | | | | 350.00 | 7.00 | 41.00 | 0.00 | 0.00 | 0.00 | 240.00 | 0.00 | 255.00 | 398.00 | 0.00 | 495.00 | 893.00 | |

349

NATIONAL AGRICULTURAL RESEARCH PROJECT (NARP)
USAID PROJECT NO 263-0152

C AGRICULTURE RESEARCH STATIONS
H HORTICULTURE RESEARCH STATIONS
A ANIMAL RESEARCH STATIONS

R RENOVATION
C COMPLETION
N NEW CONSTRUCTION

STRUCTION COSTS REQUIRED FOR THE RESEARCH STATIONS

| STATION NAME | AREA (FEDDAN) C | H | A | TOTAL | ITEM DESCRIPTION | COST ESTIMATE (1000 LE) RENOVATION C | H | A | COMPLETION C | H | A | NEW CONSTRUCTION C | H | A | SUB TOTAL R | C | N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1) SABAHIA | 15 | 75 | + | 90 | | | | | | | | | | | | | |
| | | | | | ADMINISTRATION | 30.00 | 20.00 | 0.00 | 0.00 | 120.00 | 0.00 | 35.00 | 0.00 | 0.00 | 55.00 | 120.00 | 35.00 |
| | | | | | GUESTHOUSE | 16.00 | 20.00 | 0.00 | 0.00 | 120.00 | 0.00 | 0.00 | 0.00 | 0.00 | 36.00 | 120.00 | 0.00 |
| | | | | | ST.LL.HOUSING | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | ANIMAL HOUSING | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | SHEDS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | LABS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.00 |
| | | | | | STORES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | GREEN HOUSE | 11.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.00 |
| | | | | | WATER,E.LS.LINES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 11.00 | 0.00 | 0.00 |
| | | | | | OTHERS | 3.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.00 | 0.00 | 0.00 |
| 2) BORG EL ARAB | | | | | | | | | | | | | | | | | |
| | | | | | ADMINISTRATION | 0.00 | 0.00 | 30.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 60.00 | 30.00 | 0.00 | 60.00 |
| | | | | | GUESTHOUSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | ST.LL.HOUSING | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | ANIMAL HOUSING | 0.00 | 0.00 | 15.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | SHEDS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 35.00 | 15.00 | 0.00 | 35.00 |
| | | | | | LABS | 0.00 | 0.00 | 5.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | STORES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 5.00 | 0.00 | 0.00 |
| | | | | | GREEN HOUSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.00 | 0.00 | 0.00 | 25.00 |
| | | | | | WATER,E.LS.LINES | 0.00 | 0.00 | 10.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | OTHERS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.00 | 0.00 | 0.00 |
| 3) EL NOBARIA | 100 | 100 | + | 200 | | | | | | | | | | | | | |
| | | | | | ADMINISTRATION | 450.00 | 53.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 503.00 | 0.00 | 0.00 |
| | | | | | GUESTHOUSE | 20.00 | 20.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 40.00 | 0.00 | 0.00 |
| | | | | | ST.LL.HOUSING | 12.00 | 15.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 27.00 | 0.00 | 0.00 |
| | | | | | ANIMAL HOUSING | 40.00 | 18.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 78.00 | 0.00 | 0.00 |
| | | | | | SHEDS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | LABS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | STORES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | GREEN HOUSE | 10.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.00 | 0.00 | 0.00 |
| | | | | | WATER,E.LS.LINES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | OTHERS | 110.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 110.00 | 0.00 | 0.00 |
| | | | | | | 238.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 238.00 | 0.00 | 0.00 |
| 4) TAHRIR | | | | | | | | | | | | | | | | | |
| | | | | | ADMINISTRATION | 0.00 | 32.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 32.00 | 0.00 | 0.00 |
| | | | | | GUESTHOUSE | 0.00 | 12.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 12.00 | 0.00 | 0.00 |
| | | | | | ST.LL.HOUSING | 0.00 | 15.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 15.00 | 0.00 | 0.00 |
| | | | | | ANIMAL HOUSING | 0.00 | 3.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.00 | 0.00 | 0.00 |
| | | | | | SHEDS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | LABS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | STORES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | GREEN HOUSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | WATER,E.LS.LINES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | OTHERS | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 |
| 5) SAKHA & KAFRA | 3000 | + | 100 | 3100 | | | | | | | | | | | | | |
| | | | | | ADMINISTRATION | 340.00 | 0.00 | 760.00 | 0.00 | 0.00 | 0.00 | 35.00 | 0.00 | 0.00 | 1,100.00 | 0.00 | 35.00 |
| | | | | | GUESTHOUSE | 30.00 | 0.00 | 40.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 70.00 | 0.00 | 0.00 |
| | | | | | ST.LL.HOUSING | 20.00 | 0.00 | 5.00 | 0.00 | 0.00 | 0.00 | 35.00 | 0.00 | 0.00 | 25.00 | 0.00 | 35.00 |
| | | | | | ANIMAL HOUSING | 50.00 | 0.00 | 30.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 80.00 | 0.00 | 0.00 |
| | | | | | SHEDS | 0.00 | 0.00 | 473.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 473.00 | 0.00 | 0.00 |
| | | | | | LABS | 0.00 | 0.00 | 106.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 | 0.00 | 0.00 |
| | | | | | STORES | 0.00 | 0.00 | 10.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.00 | 0.00 | 0.00 |
| | | | | | GREEN HOUSE | 30.00 | 0.00 | 15.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 45.00 | 0.00 | 0.00 |
| | | | | | WATER,E.LS.LINES | 10.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.00 | 0.00 | 0.00 |
| | | | | | OTHERS | 100.00 | 0.00 | 50.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 230.00 | 0.00 | 0.00 |
| | | | | | | 20.00 | 0.00 | 37.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 57.00 | 0.00 | 0.00 |
| 6) RAHALLET MOUSA & KARABA | + | + | 100 | 100 | | | | | | | | | | | | | |
| | | | | | ADMINISTRATION | 0.00 | 0.00 | 903.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 435.00 | 903.00 | 0.00 | 435.00 |
| | | | | | GUESTHOUSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 40.00 | 0.00 | 0.00 | 40.00 |
| | | | | | ST.LL.HOUSING | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | ANIMAL HOUSING | 0.00 | 0.00 | 5.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | SHEDS | 0.00 | 0.00 | 203.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 65.00 | 203.00 | 0.00 | 65.00 |
| | | | | | LABS | 0.00 | 0.00 | 510.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 120.00 | 510.00 | 0.00 | 120.00 |
| | | | | | STORES | 0.00 | 0.00 | 10.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 45.00 | 10.00 | 0.00 | 45.00 |
| | | | | | GREEN HOUSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 30.00 | 0.00 | 0.00 | 30.00 |
| | | | | | WATER,E.LS.LINES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | OTHERS | 0.00 | 0.00 | 180.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 180.00 | 0.00 | 0.00 |
| 7) EL SERW | 500 | + | 100 | 600 | | | | | | | | | | | | | |
| | | | | | ADMINISTRATION | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 135.00 | 0.00 | 0.00 | 135.00 |
| | | | | | GUESTHOUSE | 0.00 | 0.00 | 235.00 | 60.00 | 0.00 | 0.00 | 100.00 | 0.00 | 15.00 | 235.00 | 60.00 | 115.00 |
| | | | | | ST.LL.HOUSING | 0.00 | 0.00 | 10.00 | 60.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.00 | 60.00 | 0.00 |
| | | | | | ANIMAL HOUSING | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | SHEDS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | LABS | 0.00 | 0.00 | 150.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | STORES | 0.00 | 0.00 | 60.00 | 0.00 | 0.00 | 0.00 | 20.00 | 0.00 | 15.00 | 150.00 | 0.00 | 35.00 |
| | | | | | GREEN HOUSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 60.00 | 0.00 | 0.00 |
| | | | | | WATER,E.LS.LINES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 30.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | OTHERS | 0.00 | 0.00 | 15.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 15.00 | 0.00 | 0.00 |
| | | | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 15.00 | 0.00 | 0.00 |
| 8) ISMAILIA | 100 | + | + | 100 | | | | | | | | | | | | | |
| | | | | | ADMINISTRATION | 165.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 30.00 | 0.00 | 30.00 |
| | | | | | GUESTHOUSE | 30.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 165.00 | 0.00 | 0.00 |
| | | | | | ST.LL.HOUSING | 30.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 30.00 | 0.00 | 0.00 |
| | | | | | ANIMAL HOUSING | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 30.00 | 0.00 | 0.00 |
| | | | | | SHEDS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | LABS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | STORES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | GREEN HOUSE | 35.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | WATER,E.LS.LINES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 35.00 | 0.00 | 0.00 |
| | | | | | OTHERS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | | 10.00 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

| STATION NAME | AREA (FEDDAN) C | H | A | TOTAL | ITEM DESCRIPTION | COST ESTIMATE (1000 LE) RENOVATION C | H | A | COMPLETION C | H | A | NEW CONSTRUCTION C | H | A | SUB TOTAL C | H | A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11) EL KASSASIN | | 170 | | 170 | | 0.00 | 180.00 | 0.00 | 0.00 | 0.00 | 0.00 | 12.00 | 0.00 | 0.00 | 180.00 | 0.00 | 0.00 |
| | | | | | ADMINISTRATION | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | GUESTHOUSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | ST.AL.HOUSING | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | ANIMAL HOUSING | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | SHEDS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| + SILK & BEES RES.CENTER (ZAGAZIG) | | | | | LABS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 12.00 | 0.00 | 0.00 | 0.00 | 0.00 | 12.00 |
| | | | | | STORES | 0.00 | 180.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 180.00 | 0.00 | 0.00 |
| | | | | | GREEN HOUSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | WATER,E.&S.LINES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | OTHERS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10) INSHAS | | | | | | 0.00 | 0.00 | 624.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 624.00 | 0.00 | 0.00 |
| | | | | | ADMINISTRATION | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | GUESTHOUSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | ST.AL.HOUSING | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | ANIMAL HOUSING | 0.00 | 0.00 | 594.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 594.00 | 0.00 | 0.00 |
| | | | | | SHEDS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | LABS | 0.00 | 0.00 | 30.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 30.00 | 0.00 | 0.00 |
| | | | | | STORES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | GREEN HOUSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | WATER,E.&S.LINES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | OTHERS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11) EL GERNEIA | 1300 | | 30 | 1330 | | 160.00 | 0.00 | 990.00 | 0.00 | 0.00 | 0.00 | 100.00 | 0.00 | 0.00 | 1,150.00 | 0.00 | 100.00 |
| | | | | | ADMINISTRATION | 160.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 160.00 | 0.00 | 0.00 |
| | | | | | GUEST HOUSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | ST.AL.HOUSING | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | ANIMAL HOUSING | 0.00 | 0.00 | 930.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 930.00 | 0.00 | 0.00 |
| | | | | | SHEDS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 |
| | | | | | LABS | 0.00 | 0.00 | 15.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 15.00 | 0.00 | 0.00 |
| | | | | | STORES | 0.00 | 0.00 | 45.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 45.00 | 0.00 | 0.00 |
| | | | | | GREEN HOUSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | WATER,E.&S.LINES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | OTHERS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12) ZARZORA | 100 | | | 100 | | 30.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 150.00 | 0.00 | 0.00 | 30.00 | 0.00 | 150.00 |
| | | | | | ADMINISTRATION | 30.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 30.00 | 0.00 | 0.00 |
| | | | | | GUEST HOUSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | ST.AL.HOUSING | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | ANIMAL HOUSING | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | SHEDS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | LABS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | STORES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 150.00 | 0.00 | 0.00 | 0.00 | 0.00 | 150.00 |
| | | | | | GREEN HOUSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | WATER,E.&S.LINES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | OTHERS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13) SERS EL LAYAN | | | | | | 30.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 5.00 | 0.00 | 0.00 | 30.00 | 0.00 | 5.00 |
| | | | | | ADMINISTRATION | 30.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 30.00 | 0.00 | 0.00 |
| | | | | | GUEST HOUSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | ST.AL.HOUSING | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | ANIMAL HOUSING | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | SHEDS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | LABS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | STORES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 5.00 | 0.00 | 0.00 | 0.00 | 0.00 | 5.00 |
| | | | | | GREEN HOUSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | WATER,E.&S.LINES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | OTHERS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 14) BANTIEN | 200 | | | 200 | | 180.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 | 0.00 | 0.00 | 180.00 | 0.00 | 100.00 |
| | | | | | ADMINISTRATION | 180.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 180.00 | 0.00 | 0.00 |
| | | | | | GUEST HOUSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | ST.AL.HOUSING | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | ANIMAL HOUSING | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | SHEDS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 5.00 | 0.00 | 0.00 | 0.00 | 0.00 | 5.00 |
| | | | | | LABS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | STORS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 45.00 | 0.00 | 0.00 | 0.00 | 0.00 | 45.00 |
| | | | | | GREEN HOUSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | WATER,E.&S.LINES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | OTHERS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 50.00 | 0.00 | 0.00 | 0.00 | 0.00 | 50.00 |
| 15) EL KANATER | | 80 | | 80 | | 0.00 | 60.00 | 0.00 | 0.00 | 35.00 | 0.00 | 0.00 | 0.00 | 0.00 | 60.00 | 35.00 | 0.00 |
| | | | | | ADMINISTRATION | 0.00 | 0.00 | 0.00 | 0.00 | 35.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 35.00 | 0.00 |
| | | | | | GUEST HOUSE | 0.00 | 20.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 20.00 | 0.00 | 0.00 |
| | | | | | ST.AL.HOUSING | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | ANIMAL HOUSING | 0.00 | 10.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.00 | 0.00 | 0.00 |
| | | | | | SHEDS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | LABS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | STORES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | GREEN HOUSE | 0.00 | 5.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 5.00 | 0.00 | 0.00 |
| | | | | | WATER,E.&S.LINES | 0.00 | 20.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 20.00 | 0.00 | 0.00 |
| | | | | | OTHERS | 0.00 | 5.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 5.00 | 0.00 | 0.00 |
| 16) SEIEAT EL SHEIK | | | | | | 0.00 | 0.00 | 15.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 15.00 | 0.00 | 0.00 |
| | | | | | ADMINISTRATION | 0.00 | 0.00 | 3.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.00 | 0.00 | 0.00 |
| | | | | | GUEST HOUSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | ST.AL.HOUSING | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | ANIMAL HOUSING | 0.00 | 0.00 | 6.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | SHEDS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 6.00 | 0.00 | 0.00 |
| | | | | | LABS | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| | | | | | STORES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | GREEN HOUSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | WATER,E.&S.LINES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | OTHERS | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 |

| STATION NAME | AREA ( FEDDANS ) C | H | A | TOTAL | ITEM DESCRIPTION | COST ESTIMATE ( 1000 LE ) RENOVATION C | H | A | COMPLETION C | H | A | NEW CONSTRUCTION C | H | A | G.B.TOTAL G | H | A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (7) EL FAYOUM | | | 50 | 50 | | 0.00 | 0.00 | 65.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 170.00 | 65.00 | [illegible] | [illegible] |
| | | | | | ADMINISTRATION | 0.00 | 0.00 | 15.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 15.00 | [illegible] | [illegible] |
| | | | | | GUEST HOUSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | [illegible] | [illegible] |
| | | | | | ST.SL.HOUSING | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | [illegible] | [illegible] |
| | | | | | ANIMAL HOUSING | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | [illegible] | [illegible] |
| | | | | | SHEDS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | [illegible] | [illegible] |
| | | | | | LABS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | [illegible] | [illegible] |
| | | | | | STORES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 50.00 | 0.00 | [illegible] | [illegible] |
| | | | | | GREEN HOUSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | [illegible] | [illegible] |
| | | | | | WATER,E.&S.LINES | 0.00 | 0.00 | 50.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 50.00 | [illegible] | [illegible] |
| | | | | | OTHERS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 120.00 | 0.00 | [illegible] | [illegible] |
| (8) SIDS | 750 | 90 | 50 | 890 | | 154.00 | 20.00 | 60.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 40.00 | 234.00 | [illegible] | [illegible] |
| | | | | | ADMINISTRATION | 30.00 | 20.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 50.00 | [illegible] | [illegible] |
| | | | | | GUEST HOUSE | 15.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 15.00 | [illegible] | [illegible] |
| | | | | | ST.SL.HOUSING | 64.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 64.00 | [illegible] | [illegible] |
| | | | | | ANIMAL HOUSING | 0.00 | 0.00 | 60.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 40.00 | 60.00 | [illegible] | [illegible] |
| | | | | | SHEDS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | [illegible] | [illegible] |
| | | | | | LABS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | [illegible] | [illegible] |
| | | | | | STORES | 15.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 15.00 | [illegible] | [illegible] |
| | | | | | GREEN HOUSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | [illegible] | [illegible] |
| | | | | | WATER,E.&S.LINES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | [illegible] | [illegible] |
| | | | | | OTHERS | 30.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 30.00 | [illegible] | [illegible] |
| (9) MALLAWI | 200 | 0 | 15 | 215 | | 71.00 | 0.00 | 92.00 | 151.00 | 0.00 | 2.00 | 0.00 | 0.00 | 26.00 | 162.00 | 153.00 | 26.00 |
| | | | | | ADMINISTRATION | 14.00 | 0.00 | 10.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 2.00 | 24.00 | 2.00 | 2.00 |
| | | | | | GUEST HOUSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | ST.SL.HOUSING | 23.00 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 26.00 | 0.00 | 0.00 |
| | | | | | ANIMAL HOUSING | 0.00 | 0.00 | 65.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 12.00 | 65.00 | 0.00 | 12.00 |
| | | | | | SHEDS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | LABS | 0.00 | 0.00 | 0.00 | 151.00 | 0.00 | 0.00 | 0.00 | 0.00 | 12.00 | 0.00 | 151.00 | 12.00 |
| | | | | | STORES | 0.00 | 0.00 | 12.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 12.00 | 0.00 | 0.00 |
| | | | | | GREEN HOUSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | WATER,E.&S.LINES | 17.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 17.00 | 0.00 | 0.00 |
| | | | | | OTHERS | 7.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 11.00 | 0.00 | 0.00 |
| (10) SHANDAWIL | 300 | 0 | 0 | 300 | | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 | 0.00 | 0.00 |
| | | | | | ADMINISTRATION | 30.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 30.00 | 0.00 | 0.00 |
| | | | | | GUEST HOUSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | ST.SL.HOUSING | 30.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 30.00 | 0.00 | 0.00 |
| | | | | | ANIMAL HOUSING | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | SHEDS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | LABS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | STORES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | GREEN HOUSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | WATER,E.&S.LINES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | OTHERS | 20.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 20.00 | 0.00 | 0.00 |
| (11) EL MATAWA | 100 | 50 | 0 | 150 | | 80.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.00 | 0.00 | 0.00 | 80.00 | 0.00 | 10.00 |
| | | | | | ADMINISTRATION | 80.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 80.00 | 0.00 | 0.00 |
| | | | | | GUESTHOUSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | ST.SL.HOUSING | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | ANIMAL HOUSING | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | SHEDS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | LABS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | STORES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | GREEN HOUSING | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | WATER,E.&S.LINES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | OTHERS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.00 |
| (12) KOMOMBO | 100 | 0 | 0 | 100 | | 10.00 | 0.00 | 0.00 | 20.00 | 0.00 | 0.00 | 50.00 | 0.00 | 0.00 | 10.00 | 20.00 | 50.00 |
| | | | | | ADMINISTRATION | 10.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.00 | 0.00 | 0.00 |
| | | | | | GUEST HOUSE | 0.00 | 0.00 | 0.00 | 20.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 20.00 | 0.00 |
| | | | | | ST.SL.HOUSING | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | ANIMAL HOUSING | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | SHEDS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | LABS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | STORES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | GREEN HOUSING | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | WATER,E.&S.LINES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | | | | OTHERS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.00 |
| (13) W.EL GEDEED | 3765 | 630 | 380 | 4775 | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 11,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | [illegible] |
| | | | | | ADMINISTRATION | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 11,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | [illegible] |
| | | | | | GUEST HOUSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | [illegible] |
| | | | | | ST.SL.HOUSING | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | [illegible] |
| | | | | | ANIMAL HOUSING | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | [illegible] |
| | | | | | SHEDS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | [illegible] |
| | | | | | LABS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | [illegible] |
| | | | | | STORES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | [illegible] |
| | | | | | GREEN HOUSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | [illegible] |
| | | | | | WATER,E.&S.LINES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | [illegible] |
| | | | | | OTHERS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | [illegible] |
| (14) TOTAL ADMINISTRATION BUILDING ( RENOVATION ) | | | | | | 11,020.00 | 365.00 | 3,774.00 | 231.00 | 155.00 | 2.00 | 11,397.00 | 0.00 | 751.00 | 15,151.00 | 388.00 | 2,248.00 |
| | | | | | | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 | 0.00 | 0.00 |
| | | | | | ADMINISTRATION | 700.00 | 72.00 | 78.00 | 40.00 | 155.00 | 2.00 | 0.00 | 0.00 | 42.00 | 850.00 | 217.00 | 42.00 |
| | | | | | GUESTHOUSE | 105.00 | 50.00 | 5.00 | 20.00 | 0.00 | 0.00 | 35.00 | 0.00 | 0.00 | 160.00 | 20.00 | 35.00 |
| | | | | | ST. SL.HOUSING | 247.00 | 21.00 | 33.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 301.00 | 0.00 | 0.00 |
| | | | | | ANIMAL HOUSING | 0.00 | 10.00 | 2,346.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 157.00 | 2,356.00 | 0.00 | 157.00 |
| | | | | | SHEDS | 0.00 | 0.00 | 740.00 | 0.00 | 0.00 | 0.00 | 135.00 | 0.00 | 135.00 | 740.00 | 0.00 | 270.00 |
| | | | | | LABS | 0.00 | 0.00 | 131.00 | 151.00 | 0.00 | 0.00 | 12.00 | 0.00 | 57.00 | 131.00 | 151.00 | 69.00 |
| | | | | | STORES | 90.00 | 180.00 | 72.00 | 0.00 | 0.00 | 0.00 | 255.00 | 0.00 | 105.00 | 342.00 | 0.00 | 360.00 |
| | | | | | GREEN HOUSE | 21.00 | 5.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 26.00 | 0.00 | 0.00 |
| | | | | | WATER,E.&S.LINES | 307.00 | 20.00 | 308.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 635.00 | 0.00 | 0.00 |
| | | | | | OTHERS | 350.00 | 7.00 | 41.00 | 0.00 | 0.00 | 0.00 | 160.00 | 0.00 | 255.00 | 398.00 | 0.00 | 415.00 |
| (15) TOTAL | | | | | | 1,920.00 | 365.00 | 3,774.00 | 231.00 | 155.00 | 2.00 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

NATIONAL AGRICULTURAL RESEARCH PROJECT

USAID PROJECT NO 263-0152

ESTIMATE OF CONSTR.RESEARCH INSTITUTES FOR RESEARCH INSTITUTES

| INSTITUTES | ITEM DISCRIPTION | LOCATION | AREA M2 | RENOVATION | COMPLETION | NEW CONSTRUCTION | TOTAL |
|---|---|---|---|---|---|---|---|
| 1) FIELD CROPS | | | | 145 | 135 | 5 | 285 |
| | LABS 25 | GIZA | | 25 | 0 | 0 | 25 |
| | GREENHOUSE 2 | .... | | 10 | 0 | 0 | 10 |
| | STORES | .... | 20 | 0 | 0 | 5 | 5 |
| | SECOND FLOOR | .... | 300 | 0 | 60 | 0 | 60 |
| | SECOND FLOOR | .... | 500 | 0 | 75 | 0 | 75 |
| | WORK SHOP | .... | | 50 | 0 | 0 | 50 |
| | FARM EQUP.SHED | .... | | 25 | 0 | 0 | 25 |
| | CHICK&MAIZE STORE | .... | | 25 | 0 | 0 | 25 |
| | LIMBER STATION | .... | 50 | 10 | 0 | 0 | 10 |
| 2) COTTON | | | | 750 | 0 | 250 | 1000 |
| | LABS 12 | GIZA | | 0 | 0 | 200 | 200 |
| | STORES 2 | .... | | 0 | 0 | 50 | 50 |
| | | SAKHA | | 750 | 0 | 0 | 750 |
| 3) SUGER CROPS | | | | 25 | 0 | 40 | 65 |
| | COOLING ROOMS | GIZA | 16 | 0 | 0 | 40 | 40 |
| | GREENHOUSE | SABAHIA | | 15 | 0 | 0 | 15 |
| | | .... | | 10 | 0 | 0 | 10 |
| 4) HORTICULTURE | | | | 150 | 150 | 250 | 550 |
| | SECOND FLOOR | GIZA | | 0 | 100 | 0 | 100 |
| | LABS | .... | | 0 | 0 | 150 | 150 |
| | WOODEN TREES | .... | | 0 | 0 | 50 | 50 |
| | SECOND FLOOR | .... | | 0 | 50 | 0 | 50 |
| | STORS VEG. | DOKI | | 0 | 0 | 25 | 25 |
| | STORE | GIZA | | 0 | 0 | 25 | 25 |
| | ? RENOVATION | .... | | 150 | 0 | 0 | 150 |
| 5)ANIMAL PRODUCTION | | | | 300 | 175 | 0* | 475 |
| | W.,E.&GAS LINE | GIZA | | 100 | 0 | 0 | 100 |
| | | .... | | 50 | 0 | 0 | 50 |
| | ? RENOVATION | | | 50 | 0 | 0 | 50 |
| | LABS FIRE PROTCTION | .... | | 100 | 0 | 0 | 100 |
| | STORS | .... | | 0 | 25 | 0 | 25 |
| | SECOND FLOOR LAB | .... | | 0 | 50 | 0 | 50 |
| | STORES | B.BARRAGE | | 0 | 50 | 0 | 50 |
| | | .... | | 0 | 50 | 0 | 50 |
| 6) SERUM & VACCINE PRO. | | | | 50 | 0 | 280 | 330 |
| | STABLS 3 | CAIRO | | 50 | 0 | 0 | 50 |
| | LABS 2 | .... | | 0 | 0 | 200 | 200 |
| | STORES 3 | .... | | 0 | 0 | 80 | 80 |
| 7) GENERATION | | | | 50 | 0 | 120 | 170 |
| | ? RENOVATION | | | 50 | 0 | 0 | 50 |
| | LABS 12 | | | 0 | 0 | 100 | 100 |
| | SHEEP STABLES | | | 0 | 0 | 10 | 10 |
| | CAWLSHEEP SHEDS | | | 0 | 0 | 10 | 10 |
| 8) PLANT PROTECTION | | | | 100 | 200 | 225 | 525 |
| | W.&E.RENOVATION | GIZA | | 15 | 0 | 0 | 15 |
| | FENCE (ADD HIGHT) | .... | | 5 | 0 | 0 | 5 |
| | SECOND FLOOR | .... | | 20 | 0 | 0 | 20 |
| | SILK DEP. | GIZA | | 5 | 0 | 0 | 5 |
| | SILK BLD. | B.BARRAGE | | 50 | 0 | 0 | 50 |
| | | GIZA | | 5 | 0 | 0 | 5 |
| | SEC.&THERD FLOOR | .... | | 0 | 200 | 0 | 200 |
| | LAB 3 FLOOR | .... | | 0 | 0 | 100 | 100 |
| | LAB | SABAHIA | | 0 | 0 | 50 | 50 |
| | LAB | .... | 160 | 0 | 0 | 75 | 75 |
| 9)PLANT DISEASES | | | | 100 | 0 | 0 | 100 |
| | AUTO LIGHT CONTROL | | | 50 | 0 | 0 | 50 |
| | ? RENOVATION | | | 50 | 0 | 0 | 50 |
| 10) LAND &SOILS | | | | 50 | 0 | 200 | 250 |
| | ? RENOVATION | | | 50 | 0 | 0 | 50 |
| | LABS 15 | | | 0 | 0 | 170 | 170 |
| | STORES | | 620 | 0 | 0 | 30 | 30 |
| 11) AGR. MACHINERY | | | | 50 | 100 | 0 | 150 |
| | TRACTOR LAB TEST | ALEX | | 50 | 0 | 0 | 50 |
| | LAB TEST | .... | 500 | 0 | 100 | 0 | 100 |
| 12) AGR. ECONOMICS | | | | 0 | 0 | 0 | 0 |
| | INSTITUTE | GIZA | 1500 | 0 | 0 | 0 | 0 |
| 13) EXT.&RURAL DEV. | | | | 0 | 0 | 0 | 0 |
| | INSTITUTE | | | 0 | 0 | 0 | 0 |
| 14) PLANT PROT.&EXEMPTION | | | | 50 | 0 | 450 | 500 |
| | ? RENOVATION | ALEX | | 50 | 0 | | 50 |
| | LABS | .... | | | | 450 | 450 |
| 15) CENTERAL HERBICIDE LAB | | | | 160 | 0 | 0 | 160 |
| | GREENHOUSE | GIZA | | 50 | 0 | 0 | 50 |
| | LABS 12 | | | 100 | 0 | 0 | 100 |
| | STORES | | | 10 | 0 | 0 | 10 |
| INSTITUTES | TOTAL | | | 1980 | [illegible] | [illegible] | [illegible] |

353

NATIONAL AGRICULTURE RESEARCH PROJECT ( NARP)
USAID PROJECT NO 263-0152

ESTIMATE OF CONSTRUCTION COST REQUIRED FOR ON FARM

| SITE | ITEM DISCRIPTION | AREA M2 | COST ESTIMATE ( LE ) RENOVATION | COMPLETION | NEW CONSTRUCTION | TOTAL |
|---|---|---|---|---|---|---|
| 1) KAFER EL SHEKH | STORE AND GARAGE | 150 | 0 | 22.5 | 0 | 22.5 |
| 2) GIZA | STORES,GARAGE AND OFFICE | 150 | 0 | 22.5 | 0 | 22.5 |
| 3) FAYOUM | ONE FLOOR | 100 | 5 | 15 | 0 | 20 |
| | | | | | 0 | 0 |
| 4) BENI SWIFF | ONE FLOOR | 150 | 0 | 22.5 | 0 | 22.5 |
| 5) EL MENIA | ONE FLOOR | 100 | 5 | 15 | 0 | 20 |
| | | | | | 0 | 0 |
| 6) ASWAN | ONE FLOOR | 150 | 0 | 22.5 | 0 | 22.5 |
| | TOTAL | 800 | 10 | 120 | 0 | 130 |
| 1) ALEXANDRIA | | 300 | 0 | 0 | 45 | 45 |
| 2) EL GHARBIA | | 300 | 0 | 0 | 45 | 45 |
| 3) EL DELENGAT -KOM HAMADA | | 200 | 0 | 0 | 30 | [illegible] |
| 4) ASHMON - TALA | | 200 | 0 | 0 | 30 | [illegible] |
| 5) EL SANTA -KETOR | | 200 | 0 | 0 | 30 | [illegible] |
| 6) BEILA -DESOK | | 200 | 0 | 0 | 30 | [illegible] |
| 7) FARASKOR -KAFER SSAAD | | 200 | 0 | 0 | 30 | 30 |
| 8) MEET GHAMER -DEKERNES | | 200 | 0 | 0 | 30 | 30 |
| 9) FAIED -EL KASSASIN | | 200 | 0 | 0 | 30 | [illegible] |
| 10) FAKOS -ABOU KEBIER | | 200 | 0 | 0 | 30 | [illegible] |
| 11) KAFER SHOKER -EL KANATER | | 200 | 0 | 0 | 30 | [illegible] |
| 12) EL SAFF - EL BADRASHEEN | | 200 | 0 | 0 | 30 | [illegible] |
| 13) TAMIA -ATSA | | 200 | 0 | 0 | 30 | [illegible] |
| 14) EL WASTA -BEBA | | 200 | 0 | 0 | 30 | [illegible] |
| 15) MALLAWY -SAMALOT | | 200 | 0 | 0 | 30 | [illegible] |
| 16) EL KOSA - SEDFA | | 200 | 0 | 0 | 30 | [illegible] |
| 17) EL MENSHA -SAKALTA | | 200 | 0 | 0 | 30 | [illegible] |
| 18) [illegible] | | 100 | 0 | 0 | 15 | [illegible] |
| 19) ASWAN | | 100 | 0 | 0 | 15 | 15 |
| | TOTAL | 3800 | 0 | 0 | 570 | [illegible] |
| | GRAND TOTAL | | 10 | 120 | 570 | [illegible] |

بسم الله الرحمن الرحيم

ARAB REPUBLIC OF EGYPT
MINISTRY OF AGRICULTURE & LAND RECLAMATION
NATIONAL AGRICULTURAL RESEARCH PROJECT
DIRECTOR GENERAL
9 GAMAA STREET, GIZA
Tel 723000 - 736028 - 722342
Telex: 20332 FCRI UN

جمهورية مصر العربية
وزارة الزراعة واستصلاح الأراضي
المشروع القومي للابحاث الزراعية
مدير عام المشروع
٩ شارع الجامعة - الجيزة
٧٢٢٣٤٢ - ٧٣٦٠٢٨ - ٧٢٣٠٠٠
تلكس ٢٠٣٣٢ FCRI UN

13 December 1987

Mr. John Foti, Project Officer
Directorate for Agricultural
Resources
The United States Agency
for International Development
Kasr El Aini Street
Garden City, Cairo

RE: National Agricultural Research Project
USAID Project No. 263-0152
Research Support Program

Dear Mr. Foti:

This letter is responding to our several discussions over the past weeks regarding the method of financing for the Research Support Program. Attached is a paper recording the agreements reached during those discussions.

Three major purpose statements for the Research Support Program have been formulated. They are:

1. *Management*

   An improved management system that effectively addresses the planning, implementation and evaluation aspects of research.

2. *Program*

   An improved system for establishing research priorities within national development objectives.

3. *Financial*

An improved financial management system for budgeting, accounting and reporting of research expenditures.

The following outputs have been identified for the Research Support Program:

Management

1) Research support planning focuses on national goals and cost effective methodology.

2) Implementation status of all approved research proposals maintained by computer.

3) Research monitoring and evaluation resulting in realignment or early termination of marginally implemented research proposals.

Program

1) 100% of research funded within the highest priorities of the national development goals.

Finance

1) Budgets developed based on prioritized needs.

2) ARC and Institutes computerized accounting system is tracking funds by approved research proposals.

3) Timely financial reports meeting management needs.

To achieve the desired improvements, mutually agreed upon targets will be established and jointly assessed on an annual basis. Fulfillment of annual targets will permit project support for the next year's mutually agreed upon level of funding for ARC's operating costs of research. Three months before the end of each GOE fiscal year, the following will occur: first, a joint assessment will take place to determine target fulfillment; second, the targets and level of funding for the next year will be mutually agreed to. These targets and funding level will be included as part of the research component's Annual IFP. In many cases, the targets will require changes in ARC operating procedures. The project's funding will be used to finance operating costs of research, but not to finance fulfillment of targets or procedural changes on the part of ARC. Project support is expected to be approximately $3.6 million per year. Expenditures of these funds will comply with USAID regulations.

To put this system in place before January 1988, ARC and USAID will agree on the targets which were achieved since the inception of the Research Support Program. Identification and joint assessment of these targets will permit a mutually agreed level of project support for research operating costs from January 1988 through June 1989. In March 1988, the second set of targets for the period April 1988, through March 1989, will be mutually agreed to. This second set of targets will be met by March 1989, and will be jointly assessed at that time. Fulfillment of the second set of targets will permit the funding for the GOE FY 1989-90. Immediately following this assessment in March 1989, the third set of targets for the period April 1989, through March 1990, will be mutually agreed to. This cycle will continue throughout the life of the project.

Accomplishments for the period ending December 1987 include:

A plan for development of an improved research management system reflected in the EOPS below.

Implementation of the improved system of research management in the six new Interdisciplinary programs and the On-Farm Trials in order to demonstrate viability of the system.

Two training plans covering in-country and offshore training developed and approved.

A plan for establishment of a Central Service Unit for maintenance developed.

Purchased and installed 40 computers and related equipment and trained 35 users in basic computer operations of word processing and spreadsheet techniques.

Trained 7 users in special techniques for spreadsheet applications for budget development and expenditure reporting.

Developed a computer based system for budget development and cash flow forecasting for RSP.

Annual targets will be established for the following EOPS:

Management

1. All of the ARC research proposals which were submitted for funding were in areas of study which were within national development goals.

2. All the ARC research proposals include a cost analysis of alternative appropriate methodologies and indicate selection of the most cost effective methodology.

3. The implementation status of all approved and ongoing research proposals is being maintained by computers.

4. Twenty-five percent of all research proposals were re-designed as a direct result of research monitoring and/or evaluations.

5. Five percent research proposals were terminated early due to a low level of implementation which was determined by research monitoring and/or evaluations.

Program

1. All ARC research proposals which were awarded funding for the first time are in areas of study which are within national development goals.

2. All of the ARC research budget was allocated to highest priority research.

Finance

1. All of the ARC budgeting being developed around highest priority research needs.

2. A Computer based accounting system is tracking funds of ongoing research proposals.

3. All ARC financial reporting is being done by computer.

4. All ARC financial reports are submitted on time.

5. All ARC identified management needs for financial reports are being met.

Please prepare the necessary Project Implementation Letter for my counter signature to implement these agreements.

With best regards,

Sincerely yours,

13/12/87

Dr. Ahmed Momtaz
Director General

# National Agricultural Research Project
# Research Support Program

## Issue

What is the most appropriate financing methodology for implementing the Research Support Program which also assures measurable development objectives of the Project?

## Summary

The Research Support Program (RSP) is a mechanism for funding research activities within the Agricultural Research Center (ARC). The current method of financing by USAID, as well as the current system of technical supervision, is not in conformity with the management desires of either USAID or the Ministry.

The objective of this paper is to discuss and document the decision to select the most appropriate financing methodology which will assure the attainment of Project objectives.

## Background

RSP was designed to assist the Ministry in meeting recurrent costs of the ARC. Project Paper Amendment No. 1, in September 1986, was approved to add this element to NARP. This was in recognition of: (a) the additional costs involved in executing interdisciplinary research activities; (b) expenditure rates above the available appropriations for research activities undertaken by predecessor USAID-funded projects; (c) a desire to increase overall funding for research in the agricultural sector; and, (d) the general deterioration of economic conditions within the country.

Negotiations between USAID and MOA over the Summer of 1986 resulted in establishment of the program. A significant change in currency exchange rates in late 1986 provided the funding needed to begin RSP. Initial RSP funding was 22.8 million US dollars ($ 22,800,000).

In December 1986, agreement was reached between USAID and MOA for an initial program of 3.4 million Egyptian pounds (EG£ 3,400,000). RSP was funded through a cash advance to the Ministry. The advance is subsequently liquidated through documented expenditures for eligible program costs. This had been a typical funding arrangement for USAID and MOA assistance projects in Egypt.

Among other criteria for funding in this initial period, RSP required that the activity be on-going, previously funded by USAID and included in the *ARC Five Year Plan of Research*. It must be a priority of the Ministry to continue or complete the research underway. All research activities funded at that point met these criteria.

## Program Rationale

The Ministry of Agriculture and Land Reclamation has identified four major constraints that impinge on agricultural development and production in Egypt. The RSP will address components in each of these four areas through strategies identified in annual Implementation and Financial Plans (IFP). The major constraints are:

1. Policy

   The issue of policy is important and very complex. Maximization of net agricultural national production requires the government to direct agricultural resources toward production that conforms with the principles of specialization and comparative advantage for Egypt. Emphasis is placed on policies which increase the productivity of land, labor, capital and organizational aspects of production. Future agricultural policy should adjust food priorities as related to food security and adjust agricultural development policy in a complementary manner. Priority should be assigned to food commodities required by the majority of the population, especially those consumed by low-income groups: for example, cereals and pulses will have priority over meat; and dairy products will have higher priority than red meat.

   Future policies must emphasize the needs of rural society and the interests of small farmers. Gradual relaxation is needed in the area of government price and production controls.

2. Institutions and Organizations

   Many institutions and organizations are related to the agricultural system and have an impact on it. Large numbers of government staff are working in the agricultural system. All facets need to be better-integrated and involved in planning and execution of agricultural programs. Some of the strategies are to:

   a. Develop stronger linkages between the Ministry of Agriculture and non-ministerial organizations, including

universities, the private sector and international agricultural research centers (IARC).

b. Improve inter- and intra-organizational management systems which will:

- Provide methodologies for establishing priorities and implementing programs;

- Create better cooperation between the various research institutes, departments and laboratories within the Agricultural Research Center, Ministry of Agriculture and Land Reclamation, and other agencies;

- Improve utilization of financial and manpower resources;

- Increase the flow of communication and dissemination of information ; and,

- Promote better integration between research and extension.

3. Resources

The amount of arable land is a key constraint to increased agricultural production, conservation and maintenance. This constraint requires an integrated set of programs centered around rational uses of irrigation water and fertilizer, pest management, soil management and appropriate cropping patterns.

In mechanization, appropriate machinery, equipment and tools are needed to increase the efficiency of both human and animal energy in a manner consistent with Egypt's socioeconomic conditions. Research centers and engineering companies will be encouraged to design and produce machines that represent appropriate mechanical technology for Egypt.

Human resources need to be better utilized. Egyptian agricultural officials need training to enhance their planning, management and policy implementation skills, while research staff need training which will promote technological advances. Practical training programs should improve the development of professional and personal capabilities and skills of the agricultural labor force, using resources of the MOA and other ministries. More attention should be given to the needs and training of the rural family as a means of improving production.

Financial resource allocations from the GOE to the ARC are inadequate to fund realistic research needs. The improved utilization of these resources can be obtained by improving the method of allocation to research on a priority-based system operating at the ARC level.

4. Technology

Agricultural programs concerned with developing means to increase food and feed production must develop new basic research, explore emerging technologies, adapt technologies developed elsewhere for use in Egypt, and utilize suitable technology that has been developed in Egypt but not implemented in farmers' fields. More emphasis will be directed toward applied research in ARC.

Technological constraints in Egyptian agriculture are greater and more sophisticated than those operating in most other developing countries. Plans will be made to adopt a long-term policy for transfer of biological technology on a broad scale for field crops, horticultural crops and livestock.

Production goals stress major increases for grain crops, edible oils, sugar, poultry and export items such as rice, vegetables, fruits and flowers. Significant production increases are planned for milk and fish.

Crop yields need to be increased through improved practices, especially when research confirms the likelihood of achievement. All appropriate means and programs should be taken, which include improved seed, testing rates of fertilization, and providing pesticides and chemicals for pest control.

Economic and statistical studies need to determine the economics of producing agricultural products for domestic and export purposes, with special studies on new or proposed technologies, credit and marketing.

Effective linkages must be made between researchers, research centers, extension and farmers to increase the transfer of new technology.

## Strategy

The Research Support Program is one of several interventions designed to ameliorate these constraints, principally in the technical area.

Specific strategies for the accomplishment of program objectives have been developed. Each component of the project, in concert with CID TA and the Working Group, has developed activity sets which are designed to accomplish specific goals.

These activity sets are products of a planning strategy for obtaining the kinds of end products desired. Activity sets describe the main activities and associated subactivities that will be carried out to produce results desired as outputs of strategy. Anticipated scheduling of activities and subactivities of each is presented in Annex B of LOPP.

Individual TA strategies in the LOPP describe: a) the main constraints that justify the need for specific activities; b) describe the existing situation in Egypt; c) relate what the advisor and relevant counterparts will do; d) identify groups both inside and outside of Egypt that will help to provide solutions to problems; e) suggest ways of arriving at the best courses of action; f) identify groups that can provide assistance for accomplishing the required tasks ; and, g) the final products expected.

Each of the activity sets and strategies is designed to meet one or more purposes of RSP as explained below.

## Goals and Purpose Statements

The goal of RSP is to improve and strengthen the existing agricultural research system of ARC so as to provide a continuous flow of improved technologies.

Three major purpose statements for the Research Support Program have been formulated. They are:

1. *Management*

   An improved management system that effectively addresses the planning, implementation and evaluation aspects of research.

2. *Program*

   An improved system for establishing research priorities within national development objectives.

3. *Financial*

   An improved financial management system for budgeting, accounting and reporting of research expenditures.

The Annual RSP Plans contain verifiable targets or expected accomplishments towards meeting these purposes through specific program accomplishments. Each of these three major purposes will be implemented through changes in systems of management. ARC and USAID will track these changes in the management system.

## Implementation and EOPS

Implementation actions required to achieve the three major purposes are numerous and complex. It will require great skill to implement them in a dynamic environment such as the ARC. Overall, the implementation of NARP is expected to improve the research system without hindering the on-going responsibilities and activities for which it is responsible.

Several EOPS have been identified and linked to the three main purposes above:

### Management

1. All of the ARC research proposals which were submitted for funding were in areas of study which were within national development goals.

2. All the ARC research proposals include a cost analysis of alternative appropriate methodologies and indicate selection of the most cost effective methodology.

3. The implementation status of all approved and ongoing research proposals is being maintained by computers.

4. Twenty-five percent of all research proposals were re-designed as a direct result of research monitoring and/or evaluations.

5. Five percent research proposals were terminated early due to a low level of implementation which was determined by research monitoring and/or evaluations.

### Program

1. All ARC research proposals which were awarded funding for the first time are in areas of study which are within national development goals.

2. All of the ARC research budget was allocated to highest priority research.

Finance

1. All of the ARC budgeting being developed around highest priority research needs.

2. A Computer based accounting system is tracking funds of ongoing research proposals.

3. All ARC financial reporting is being done by computer.

4. All ARC financial reports are submitted on time.

5. All ARC identified management needs for financial reports are being met.

Some improvements are pervasive throughout the entire research management system. The introduction of computers will be done in all three areas. An integrated approach to developmental improvements will require coordination among the areas to assure program consistency. All areas will benefit from increased training opportunities for research staff, improved facilities and equipment.

The Research Support Program component of the Annual Implementation and Financial Plan will contain the incremental improvements needed during a given twelve month period (April-March) to achieve EOPS during the life of the Project. The RSP annual targets and level of funding will be established in March of each year and will be included in the Annual IFP. The IFP will be submitted to USAID at least one month prior to the beginning of each fiscal year.

**Payment System**

The payment mechanism is based upon two different components. The release of funding is based on program changes that are developmental in nature. The fiscal reporting is based on the concept of *goods and services*. Accounting records will be maintained at a level to assure reporting to USAID by RSP expenditure categories.

The release-of-funding mechanism to be utilized for RSP is concerned with administrative performance of ARC. It is focused on measurable, substantive performance by the ARC to strengthen its management. Over the life of the project USAID financing will be conditioned on institutional performance and change.

Since the basis for USAID disbursements (not financing) is the amount spent by ARC on agricultural research without respect to type or priority standing, expense reporting by discrete research programs, sub-programs and research activities is not required for USAID funding.

The continuation of funding will be determined through approval of this RSP plan. The quantity of USAID assistance for RSP will be jointly determined through approval of annual RSP plans.

Payments will be made to ARC by USAID by a revolving advance with subsequent liquidation by expenditures. Replenishments will be made on a monthly basis. The advance balance will fluctuate based on estimated expenditure rates, as reflected in monthly cash advance requests. This will assure adequate funding for RSP on a timely basis and minimize unliquidated cash advances.

**Planning and Budgeting Cycle**

The Egyptian governmental fiscal year will be the period for RSP disbursements. Annual budgets will be prepared to conform to this period. This is the period of the annual Implementation and Financial Plans.

Annual RSP Plans will be submitted March of each year. The annual Implementation and Financial Plan containing the Research Support Program component, as well as others, will be submitted in the eleventh month of the fiscal year. Discussions in March between USAID and MOA will determine the targets and value of RSP to be included in the IFP for each year. This amount will represent the funds which USAID will make available in local currency for disbursement during the relevant fiscal year. Subsequent years will follow the same methodology and cycle with the inclusion of the monitoring function, as explained below.

USAID will issue a Project Implementation Letter to be countersigned by the MOA to implement these agreements.

**Monitoring**

During the ninth month of the fiscal year, beginning in FY 1989, a joint review will be made by USAID and MOA to determine the status of previously-agreed targets for RSP. Adjustments, if required, will be made in the new RSP targets for the following fiscal year. EOPS will be achieved by the end of the project.

USAID reserves the right to review any documentation, either financial or technical, that relates to RSP at any time during the fiscal year.

## Conclusion

The Research Support Program is an integral component and focal point for changes that are to take place as a result of NARP. The system of planning, funding and management outlined in this paper will assure the attainment of those objectives.

6

ANNEX N.6

# NATIONAL AGRICULTURAL RESEARCH PROJECT

# (NARP)

MINISTRY OF AGRICULTURE
AND LAND RECLAMATION (MOA)

The Arab Republic of Egypt (A.R.E.), Cairo

UNITED STATES AGENCY FOR INTERNATIONAL
DEVELOPMENT (USAID)

U.S Embassy, Cairo, A.R.E.

CONSORTIUM FOR INTERNATIONAL DEVELOPMENT
(CID)

Tucson, Arizona

## MANUAL FOR GRANT RESEARCH UNDER NARP

by

A. Momtaz R. Witters
B. Oteifa R. Foote

NARP Publication No. 7

USAID PROJECT 263-0152

Published: October 1987

368

## TABLE OF CONTENTS

Page

Introduction ..... 1

Specific rules ..... 2

NARP research grant proposal form: General comments ..... 5

Procedures and methods: Detailed scheme for research studies on crops ..... 8

Procedures and methods: Other types of work ..... 11

Required reports under the NARP Grants Program ..... 11

Discussion of an initial evaluation form ..... 13

Discussion of the contract ..... 13

ANNEXES:

I. A. Agronomic zones : Map and list showing the physical location of ARC stations and Faculties of Agriculture at the regional universities by zone ..... 15

B. Regional groupings for the Grants Program ..... 19

II. NARP research grant proposal form ..... 20

II. NARP project evaluation form ..... 39

IV. NARP research grant contract ..... 46

# MANUAL FOR GRANT RESEARCH UNDER NARP

## Introduction

The Grants Program under the National Agricultural Research Project (NARP) is designed in part to facilitate research by the regional universities and private research groups in Egypt that will supplement research being done by the Agricultural Research Center (ARC). Direct cooperation with ARC and/or NARP staff at times will be desirable. Later the program will involve at times collaboration with American Land Grant (Title XII) Universities and/or staff from some of the international agricultural research centers (IARC) . This manual is designed to assist non-ARC Egyptian organizations that are concerned with agricultural research in preparing research proposals that may be funded under the NARP Grants Program.

Ten agronomic zones with distinct agricultural productivity constraints have been deliniated for use under NARP and, to some extent, the Grants program will attempt to assure that priority agricultural topics (or restraints) within each zone are covered by funded research. Other grant-funded research will be concerned with restraints to increased agricultural production on a national scale or over a number of zones. Annex I in the manual contains a map detailing the 10 agronomic zones and a list that shows for each zone the physical location within it of Faculties of Agriculture of the regional universities and ARC stations. The latter are classified under Agricultural Research Stations, Horticulture Stations or Animal Production Stations. All zones except the Sinai contain ARC stations and all except the new lands and the Sinai have Faculties of Agriculture within them. Some of the institutions are near to, although not actually in the specified zone. Research institutions that apply for grants are encouraged to conduct their studies in nearby zones in order to conserve travel time and to reduce travel costs. Collaboration with nearby ARC stations or other institutions is encouraged. At times, however, a broader geographical coverage will be preferred.

Emphases under NARP include the following:

- Increased agricultural productivity
- Interdisciplinary research
- Adaptive or applied work
- On-farm trials where relevant
- Economic and sociological evaluations where relevant
- Ability to make substantial useful progress before the end of calendar year 1992 when Grant-funded research under NARP is scheduled to end.

Due to limitations of grant funds, topics that do not closely relate to increased agricultural productivity (which includes both increased output and decreased inputs) will not be funded. Improved technology transfer is an acceptable research area. The bulk of the funding will be for operational costs of the research. Limited amounts will be available to cover specialized equipment, improved facilities, out-of-country visits or short-term training, and out-of-country consultants, particularly when they provide in-country training. Each item in these areas must be justified and must relate closely to the proposed research. Special forms are provided for such requests in the research proposal. All items requested must be listed in order of priority.

## Specific Rules

- All research proposals and related documents and all required reports must be in English. All project-related correspondence should be in English.

- Each submitted proposal must be approved by the Faculty Dean or equivalent official.

- Each proposal must specify one Principal Investigator who will have overall responsibility for a given area of research. Use of one or more co-investigators is not permitted. However, a Deputy Principal Investigator must be specified in the contract. This person will become the Principal Investigator if the initial Principal Investigator is unable to serve over an extended time during the grant period.

- No person can be a Principal Investigator for more than one research project. If more than one topic was submitted initially to NARP by any given researcher and more than one was accepted on the first round of evaluation, the researcher must choose one area only on which they will be shown as a Principal Investigator for a full proposal. Remaining full proposals relating to those accepted initially may be submitted if a new Principal Investigator is listed.

- For certain projects with broad objectives, particularly when more than one institution is involved, a coordinator may be appointed by NARP. The coordinator will arrange for and chair regular meetings involving all Principal Investigators and possibly other senior staff to discuss plans, procedures and any problems that may arise and will prepare summary reports covering all phases of the research. Each Principal Investigator, however, will prepare reports and budgets covering their phase of the work.

- If more than one Department or similar administrative unit collaborates in one proposal, each one must prepare a plan of work and a budget to cover their activities. Likewise, each must prepare required reports for their phase of the research. These will be consolidated by the Principal Investigator into one report for submission to NARP. Further consolidation will take place if a coordinator is involved.

- Twice-per-year on site visits are planned by the NARP staff. Advance notice will be given and full cooperation will be expected in connection with these visits. A senior researcher from each project should be available for each visit to discuss and explain ongoing research. Visits will be arranged each time to observe most or all nearby laboratories and field plots and a sample of on-farm trials, if used. If some plots are far away (e.g. New Valley in relation to Assiut), special arrangements will be made to visit these at appropriate times

- Failure to perform planned research, to cooperate in on site visits and/or to provide required reports on schedule will result in a discontinuance of NARP funding and cancellation of the NARP contract. Any funds on hand for which acceptable receipts are not available must be refunded to NARP in such cases. This could apply to a single Department, a research institution, or an entire project depending on the circumstances.

Grant research should end no later than December 1992 to permit preparation of a final report prior to the closing date of the NARP Grant Agreement with USAID. Thus, the last cropping period covered would be the summer of 1992. A final report is due six months after termination but not later than April 1993.

Funded budgets for administration by Principal Investigators will cover only operational expenses (a detailed description of items covered is given in a later section of the Manual). If full funding as stated in the project proposal is not feasible, the Principal Investigator will be allowed to withdraw the proposal or to reduce its scope. When contracts are signed, an advance covering the approved budget for operational funds for the following three months will be provided. As an example, suppose a contract was signed in September. Operational funds for October - December would be provided initially. If acceptable receipts were submitted to NARP accounting staff covering the full budget for October, an advance for the approved budget for the following January would be provided. Similar advances would be made on a month-by-month basis. However, if receipts are less than the amount budgeted for any given past month, a reduction will be made in the advances for the corresponding later months. Reasonable adjustments between budgets and expenditures will be allowed between months and between line items. These will need to be approved by designated NARP accounting staff. If receipts are consistently below the initial budget, future budgets likely will be reduced and the funds reallocated to other projects.

Monthly operating budgets by line item and a detailed plan of work are required in the project proposal for the first full or partial July-June fiscal year covered by the proposal, with annual budget totals by line item and a broader plan of work for subsequent July-June fiscal years. However, the last month of full research will be for December 1992 or earlier. In January of each year, a monthly budget breakdown for the following fiscal year is required, together with a detailed plan of work to support it. If a project proposal is delivered to NARP in September or later within the fiscal year, an operating budget by months and a detailed plan of work also are needed for the second July-June fiscal year. Budgets should begin in the fourth month after submission of the full research proposal to NARP.

Funds for approved non-operating budgets will be handled centrally in Giza. These will be treated as part of a "strengthening grant" for each involved institution. Approval of one or more proposals by a Faculty Dean or equivalent official implies a willingness to accept and be responsible for such a strengthening grant. Desired items will be handled for each Department or similar research unit in the following way:

(a) Each item must be listed on appropriate forms in the project proposal with a "Yes" or "No" answer to the question "should your part of the proposal be dropped if funding is <u>not</u> available (for this item)?" If "Yes" is shown for items that exceed the likely availability of non-operating funds, that part of the proposal will be deleted and the involved Principal Investigator will be so informed. This could result in elimination of the full proposal.

---

* Items (a) through (c) also apply to significant facility improvements even though funds are included as a part of the operational budgets.

(b) All remaining items will be reviewed by the evaluating committee and each will be disallowed or tentatively allowed.

(c) Lists of all items tentatively allowed for a given institution and possibly by nearby institutions will be compiled and examined for duplications. If these appear, the involved institution(s) will be contacted to determine whether sharing is feasible. If so, the lists will be reduced accordingly.

(d) Totals for the revised lists, including estimated freight and handling charges for equipment, over all proposed strengthening grants will be compared with the total non-operating funds budget. Required adjustments will be made to bring tentatively approved amounts into alignment with available funds. Principal Investigators will then be notified of the specific items that have tentatively been accepted.

(e) New types of restrictions will then need checking. These are shown as footnotes in the involved project proposal forms (pp. 31-36) and should be reviewed prior to making your requests. Failure to meet these requirements would further reduce the lists.

(f) All funds budgeted for non-operational expenses will be spent in that way. Adjustments will be made by the NARP staff to bring about the best balance possible over all approved projects.

(g) At the end of the project, any equipment purchased with NARP funds becomes the property of the involved Faculty or responsible institutional unit.

(h) When all lists relating to non-operational funds are essentially final, a "strengthening grant" agreement will be signed with each involved institution. This will indicate specific items to be acquired with NARP funds, the project to which each is assigned over the period of research, any items to be shared among projects, and other pertinant information.

(i) Commodities from the USA will be requested in large batches through the NARP procurement facilities and most will be shipped in containers by sea. Delivery from date of ordering likely will take 9-12 months.

(j) Applicants for out-of-country visits or training must meet USAID and Egyptian requirements. Arrangements will be made through the NARP training staff. At least several months must be allowed for necessary clearances for any given trip. Any consultants brought to Egypt to provide training also will be handled through the NARP training staff.

(k) No new construction is allowed under the NARP Grants Program. Some refurbishment may be justified. Small facilities such as screen houses, green houses, field storage sheds, etc. may be approved where these are essential to research to be conducted for NARP. All materials for these facilities must be from Egyptian sources. Funds for facilities, if approved, will be part of the operational budget.

Further details are given in the sections that follow.

## NARP Research Grant Proposal Form: General Comments

Annex II provides a NARP Research Grant Proposal form. Some pages are to be provided for each involved Department or similar research unit, some for each involved institution, and some by each involved senior staff within the proposal. The Manual uses a loose-leaf form so that pages for which multiple copies are needed can be easily removed and duplicated. A typical proposal will involve several departments within one institution but with possible collaboration with other institutions. If so, the approving Dean (or equivalent administrator) will be at the lead institution.

The following relate to items on the Grant Proposal form:

Proposal No.: This is included in the NARP letter requesting a full proposal and may be identical to the number assigned to the initial proposal.

Lead Research Unit: Normally this will be the Department of the Principal Investigator.

Project Title: A brief, clear, specific designation of the subject of the research. The title, used by itself, should give a good indication of what the project is about. All research relates to Egypt; thus this need not be indicated in each title.

Duration: Each project should indicate the time required for completion. Research under grant projects must end by December 1992 or sooner. Funding will be on an annual basis and subject to an approved evaluation. Priority will be given to projects of one to three years duration.

Objectives: A clear, complete and logically arranged (outline form) statement of the specific objectives (outputs) of the project.

Purpose, Scope and Justification: State the purpose, scope and justification of the research project. The justification should present the importance of the problem, reasons for doing the work, such as the needs the project will fulfill and the importance of doing the work now; and ways in which public welfare or scientific knowledge will be advanced.

Previous Recent Work and Present Outlook: A review of the literature pertinent to the field of inquiry should be presented, especially research published during the last seven years. Cite and discuss the most important and recent publications that relate to the proposed research; the status of current research; and the additional information needed, to which the project is expected to contribute. (Literature citations should be listed at the end of the Research Proposal.)

General Statement of Procedures and Methods: A statement of the essential working plans and methods to be used in attaining each of the stated objectives. The procedures should correspond to the objectives (outputs) and follow the same order. Laboratory and field experimental methods and surveys should be described for each year of the project and should be summarized on the "Workplan Summary Activity Chart". This chart must be prepared for each involved Department or comparable research unit.

At least for the later years of the project on-farm trials and/or demonstrations should be involved, including an economic evaluation of effects on net farm income if relevant. Priority will be given to projects that could potentially increase net incomes within the NARP time frame.

Detailed Procedures For the Specified Time Periods: A very complete description of procedures and methods should be provided for months for which monthly budgets are required (see page 3). The next section of this manual outlines in detail what is required for projects that concern crops. Brief comments with respect to surveys and direct work with farmers are given in the following section. A separate section within the Research Proposal should relate to each involved research unit.

Personnel: The Project Proposal next shows a 2-page form that is to be filled out by the Principal Investigator and a senior researcher within each involved research unit and any collaborating institutions.

Budget: An operational budget by months is needed for the first and at times the second fiscal year, with annual totals for all fiscal years in which expenditures are planned. (See budget forms in the Project Proposal. Separate sheets are given for facility improvement and each type of non-operational item that may be desired. Please read the instructions relating to each sheet carefully). The last fiscal year may relate to full-scale research for six months (July-December 1992) or less.

Budget forms as required should be provided for each involved Department or similar research unit or major disciplinary area, with summary sheets for the entire proposal.

Receipts must be provided on a monthly basis to the NARP Executive Office, ARC, for all operational expenditures.

The following provide an explanation of operational expenditure categories:

1. Labor Costs

   a. For all non-permanent type labourers. This includes field, analytical, administrative, extension related, and laboratories.

   b. For wage payments to Graduate Assistants.

   c. Includes the applicable social security related type costs.

2. Expendable Supplies

   a. For all laboratories, field, research oriented, and office supplies.

   b. Expendable supplies are those that are consumed in the process, production, or activity which is being carried on, or that have an expected life of less than two years, or that cost less than the L.E. equivalent of $500. Examples are: seeds, chemicals, glassware, small hand tools, stakes, pollination bags, research envelopes, fertilizers, pesticides, painting materials, paper, pencils and pens, paper clips, and copy machine related supplies.

3. Travel, Transportation, and Incidental Expenses

   a. For all travel related costs (Trains, airplane, bus, taxi, vehicle rental).

   b. Transporation costs for moving project related items and equipment in country.

   c. Per Diem for lodging and meal related costs incurred while traveling in behalf of NARP.

   d. Per Diem is paid in accordance with the rates established by the Director General of the Project.

4. Repair and Maintenance

   a. For costs incurred on all project-related vehicles, office and field equipment, and simple repairs to buildings.

   b. Maintenance costs incurred for maintenance agreements for equipment, buildings, and vehicles.

   c. For the purchase of spare parts (all equipment types), and telephone maintenance costs.

   d For fuel, oil, lubrications, licensing and insurance costs.

5. Information Dissemination

   a. For extension media related costs such as bulletins, field days, and periodicals.

   b. For the cost of production, copying and printing of pamphlets, circulars, and project related publications.

   c. Art design, binding, and newsletter related costs.

   d. Cost of books, subscriptions, and periodicals purchased locally for project related activities.

   e. For costs of meetings where information is disseminated.

6. Facility Improvement

   a. New facilities are restricted to screen houses, green houses, small field storage sheds, and similar items made from materials produced in Egypt.

   b. Renovations could include interior partitions, improved plumbing and electrical wiring, added fixtures or shelving, improved irrigation facilities and similar items.

376

7. Miscellaneous

   a. For utility related cost (water consumption, electricity, natural gas, and butagas).

   b. For communication related costs such as telephone service (local and international), telex, telegrams, and postage costs.

Literature Cited: List the references cited in the research proposal according to a standard style. The following indicates required information for three types of references. Any uniform style that provides needed information is acceptable.

JOURNAL PAPER:

DETROY, R. W. and P.E. STILL 1987. Penicillium virus: Large scale concentrate and purification by polyethylene glycol. Appl. Microbiol. 28:733-735.

THESIS:

YARROW, G. 1985. The involvement of abscisic acid in correlative control of flower abscission in soybean. PhD thesis. Univ. of Minnesota, St. Paul.

EGYPTIAN JOURNAL:

EL-GALA, A.M., A. EL-LEBOUDI and A.A. SAKR 1979. Growth and nutritional status of cotton plants subjected to foliar spray with certain nutrient solutions. Agri. Res. Rev. 54:141-152.

## Procedures and Methods: Detailed Scheme for Research Studies on Crops

The following detailed scheme is suggested for periods where monthly budgets are required.

This example relates to research on crops. Similar detail should be provided for other types of research studies.*

A. Type of soil, method of irrigation, source of water, and geographic location.

B. Factors in study (variables):
   These should be clearly listed, indicating what is to be measured and evaluated. Variables should be limited to those that are needed to make recommendations to farmers. Be sure that the commodity if involved is indicated.

---

* Types of information needed for surveys and direct work with farmers are given following the example that relates to crops

C. Treatments to be used and their arrangement:
These should be listed in detail in table form whenever possible. Standard international units should be used. Each table needs a clear and complete title. If you know that an element like N is needed, do not use zero as a control. The control should be the minimum used by farmers or that will make a fairly good crop.

D. Procedures:

D.1 Experimental design:
A clear statement of the type of experimental design should be made. Complex designs should be avoided if feasible.

D.2 Number of repetitions/replications:
The number of replications should be stated.

D.3 Characteristics of the plots or units:
a. Number
b. Area (total and net)
c. Form of the plot or unit: Example - rectangular with 6 rows
d. Limits of the plot or unit: Example - 4 x 10 m
e. Seeding distance: Example - 1 m between rows and 50 cm between plants or broadcast at 5 kg/ha

D.4 Border area description:
Describe the border area in size, crop to be planted, whether area will be fertilized, and other cultural practices.

D.5 Total area of experiment: Example - 300 $m^2$
This should include borders and the actual field trial area.

E. Statistical analysis:

E.1 Scheme of analysis of variance (ANOVA) or other type:
For ANOVAs, the source and degrees of freedom for main and interaction effects should be shown. Degrees of freedom for error terms should be indicated.

E.2 Correlations, regressions:
Will correlation or regression be used and with what factors? Degrees of freedom should be indicated. Variables should be divided into those to be treated as dependent and those to be used as independent for each set of analyses.

E.3 Significance test:
For ANOVAs, LSD is recommended. For factorial analyses, please show the table of means and related LSD for any sets of factors for which the interaction F exceeds about 1.2 regardless of whether it is statistically significant. Levels of significance should be indicated in the usual way, e.g. NS for not significant at $P = 0.05$, * for significant at $P = 0.05$ but not at $P = 0.01$, ** for significant at $P = 0.01$ or less.

E.4 Coefficient of variation:
This should be given in all data tables that are based on samples.

F. Observations to be made:
This should include data that will be taken and method of taking it. Example - plant height in cm at tillering stage or size of tuber in cm circumference at harvest or yield in kg/ha at harvest based on 14% moisture.

G. Specific management of the experiment:
This section should include specific features about the management of the experiment(s) that are not included in the treatments. Example - P and K will be broadcast and incorporated three months before planting, or N will be applied at three times: 1/3 before transplanting, 1/3 at 20 days after transplanting, and 1/3 at flowering stage.

H. Cultural practices:
A statement should be made about each of the following:
a. Land preparation
b. Pest control
c. Weed control
d. Basal fertilization if used
e. Irrigation practices
f. Other pertinent practices

I. Planned studies of quality, feeding values, nutrient content, etc. If involved, the nature of these studies, factors to be covered and how the analyses will be made should be indicated. If animal feeding trials are to be used, they should be discussed in the same detail as for crop research studies covered above.

J. Benefit/cost ratio:
For each experiment where applicable, information should be obtained relating to all costs, including labor, animal power, manure and any similar inputs that might be provided by the farm family. Items should be valued at the current market rate for farmers in the area. Accurate costs are needed for <u>each</u> treatment. Gross returns should cover both the main crop (e.g. grain for cereals) and any saleable byproducts, such as straw or stover. Harvesting and threshing for on-farm trials should be performed as normally done by the farmer and byproducts that are saleable should be measured and priced at the current market rate. Net returns equal total gross returns less all costs. ANOVAs should be run for net returns. Recommended treatments should give net returns that are significantly larger at $P = 0.05$ than for lower cost treatments and should have a benefit/cost ratio of at least 1.5 when computed as

Increased gross returns/increased total costs

Ratios of 2 or larger frequently are needed to assure farmer adoption. On-farm trials should be conducted over several locations and over several years if possible before making recommendations to farmers to assess the stability of the findings.*

For rotations or permanent forage crops, net returns per ha should be computed over a 12-month period.

## Procedures and Methods: Other Types Of Work

Surveys - Details should be given with respect to the geographic area to be covered and why it was chosen, size of sample, how the sample is to be selected, how interviews are to be conducted, how data will be tabulated, and statistical analyses to be made. Types of questions to be asked should be indicated.

Direct work with farmers - This would include specific geographic areas to be covered, number of villages, number of farmers, how you plan to work with Governorate extension staff and ARC staff who are involved in direct work with farmers, type of information and/or demonstrations to be provided, planned use of printed handouts, audio-visual material, etc., and what you hope to accomplish by these activities.

## Required Reports Under the NARP Grants Program

Monthly accounting reports - Receipts must be supplied monthly in order to obtain new monthly operational expense funds. Required report forms will be provided by the NARP accounting staff.

Mid-year progress report - This is due by mid-January of each year. It should provide a brief review of research conducted during the previous July-December period, with emphasis on any findings that might modify the plan of work for the following fiscal year. The main purpose of this report is to provide a monthly budget breakdown for operational funds for the following July-June fiscal year and a detailed workplan for that period comparable to that in the Research Proposal for those months for which monthly budgets are required. A separate section should relate to each of the involved research units and any collaborative institutions. If experiments are to be essentially repeated from a prior year, you need only state that this is true and indicate any modifications that are planned.

---

* A CIMMYT study entitled "From Agronomic Data To Farmer Recommendations. An Economics Training Manual" gives a more sophisticated way of making such evaluations. This approach might be adopted at a later time.

Annual reports - In August 1989 and in the same month for each subsequent fiscal year except the last one covered by the project, a comprehensive annual report will be required. This should discuss in detail work conducted under the project during the previous fiscal year, with emphasis on any findings of importance for farmers in the geographic area to which the project relates. Tables of means with appropriate LSD and CVs should be shown for all variables measured.

Material to be included would be sirnilar to that for new activities in the mid-year progress report but would relate to all activities of substance that were planned and/or conducted during the prior fiscal year. Again a separate section should relate to each of the involved research units or disciplines. Full details are needed in the first annual report. In later reports, only changes made in relation to prior years need be shown. Research unit sections should be preceded by a summary for the entire project prepared by the Principal Investigator (or the coordinator if one is involved) with emphasis on general progress in relation to the plan and any findings of significance.

If some planned activities were not conducted, an explanation should be given as to why they were not carried out and whether they are to be postponed or deleted. As the project evolves, the summary section should include for each research unit or discipline a comparison of any findings from the most recent period under review with those from similar studies in prior periods. This summary would be based on more detailed comparisons within the sections of the annual report for each research area. Material to be included is discussed in following paragraphs.

For each completed research experiment, a top group of treatments should be identified. If ANOVAs are run, one way to identify a top group is to use LSDs for main effects for which the Fs are statistically significant if interactions are not important or to look at 2 or 3-way tables of means if the related interaction Fs exceed 1.2 or so and the LSDs that relate to them. The highest order tables for which the interaction Fs exceed this level should be used. A top group is then defined as all treatments for which the means are covered by the range calculated as the largest mean minus the related LSD. If interactions are important for a given factor, main effect means for that factor should be ignored.

If similar experiments are repeated at different locations and/or over different time periods, knowledge is needed of what treatment(s) if any remain in the top group on a consistant basis over most experiments. If consistency is lacking then, if enough experiments are run, a pattern of consistency may be found for some soil types or some types of climatic variation. These need to be considered in making recommendations to farmers. If several treatments are consistently in the top groups, then that one for which net returns are highest should be recommended provided that the benefit/cost ratio over traditional practices exceeds 1.5. Data should not be combined and new ANOVAs run unless the results are nearly the same for each of the involved experiments.

Most recommendations should be based on ANOVAs for net economic returns. In some cases, other variables may be more relevant. For varietal trials for which differences in seed costs are negligible, gross returns based on value of the main output plus any saleable byproducts could be used. Unless one variety that is truly outstanding has been identified, recommendations should cover all varieties in the top group.

Final report for each project - This will be due six months after project termination or by April 1993 whichever is earlier. Coverage would be similar to the annual report but would include all work done under the NARP project. Full details for each type of experiment should be given. Emphasis should be on identified treatments that consistently fall in the top group for both experimental and on-farm trials and the economic evaluations that relate to them. More importance should be attached to the on-farm trial results. As for the annual report, a project summary would be prepared by the Principal Investigator or the coordinator. This should note any additional needs for research in the area(s) covered by the project.

Reports on twice-per-year site visits - These will be prepared by the NARP staff following each visit and will become a permanent part of the project records.

The evaluation role of these reports - As noted previously, continued funding depends on evidence that the agreed upon research is being conducted in a satisfactory way. The above reports and the on site visits will play a major role is these ongoing evaluations.

## Discussion of An Initial Evaluation Form

A NARP Project Evaluation Form is given in Annex III. This is divided into two major sections: (a) A list of seven questions to be answered that relate to each proposal and (b) a scorecard based on 10 factors, with a maximum score of 100. Item c on page 2 shows a list any one of which could result in non-funding of a proposal. If one or more of these (other than the first) apply, the evaluation form likely would not be completed. For evaluations to be completed, part (a) should be completed first. This should assist in providing accurate numerical scores for the form covered by part (b). Scores obtained in part (b) may be used mainly to rank proposals in order of prionty in those cases for which available funds are less than minimum budgets for high priority proposals. The score would be one objective factor relating to which proposals are funded.

This form is given in this Manual primarily as a guide for those preparing proposals so that they will know the kinds of factors that will be considered in rating their proposals. The Grants Program Working Group also plans to conduct personal interviews with Principal Investigators for high-ranking proposals. Among other aspects, this would provide an opportunity to discuss likely funding in relation to the initial funding request and how best to reconcile any discrepancies.

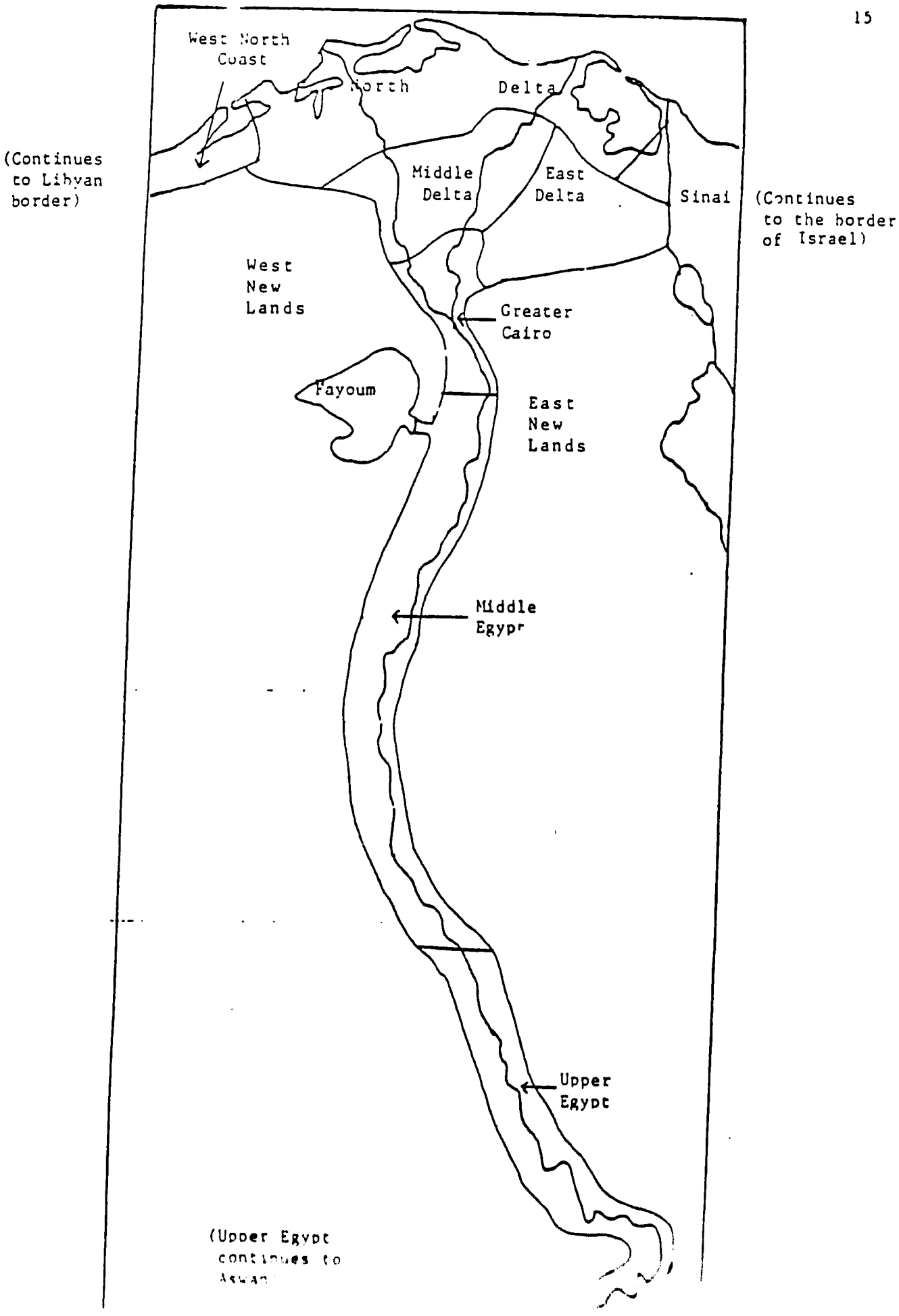
## Discussion of the Contract

This is a simple document. It is given in Annex IV. The NARP Grants Program Contract Management Information attachment should be read carefully, and care should be used to make sure that all provisions are carried out in relation to project operations.

## Annex I

A. Agronomic zones: Map and list showing the physical location of ARC stations and Faculties of Agriculture at the regional universities by zones

B. Regional groupings for the Grants Program


West North Coast
North Delta
(Continues to Libyan border)
Middle Delta
East Delta
Sinai
(Continues to the border of Israel)
West New Lands
Greater Cairo
Fayoum
East New Lands
Middle Egypt
Upper Egypt
(Upper Egypt continues to Aswan

# PHYSICAL LOCATION OF ARC RESEARCH STATIONS AND FACULTIES OF AGRICULTURE AT THE REGIONAL UNIVERSITIES BY AGRONOMIC ZONE

**UPPER EGYPT**

- Agricultural Research Stations
  - Shandaweel
  - Mataana
  - Kom Ombo
- Universities
  - Assiut

**MIDDLE EGYPT**

- Agricultural Research Stations
  - Sids
  - Malawi
- Horticulture Stations
  - Sids
- Animal Production Stations
  - Sids
  - Malawi
- Universities
  - Menya

**FAYOUM**

- Animal Productions Stations
  - Fayoum (Tamia)
- Universities
  - Cairo at Fayoum

**GREATER CAIRO**

- Agricultural Research Stations
  - Giza
  - Bahteem
- Horticulture Stations
  - Kanater (Barrages)
  - Qanabo
- Animal Production Stations
  - Dokki
  - Geziret El Sharar

Universities
- Ain Shams
- Al Azhar
- Cairo

Other
- Academy of Scientific Research and Technology
- National Research Center
- Water Research Center
- Desert Research Institute
- Desert Development Center

**MIDDLE DELTA**

Agricultural Research Stations
- Gemmeza
- Sers El Layan

Animal Production Stations
- Gemmeiza

Universities
- Mansoura
- Menufiya

**EAST DELTA**

Agricultural Research Stations
- Ismailiya

Horticulture Stations
- Kassaseen

Animal Production Stations
- Anshuss

Universities
- Suez Canal
- Zagazig
- Benha Branch, Zagazig - Mostohor

**NORTH DELTA**

Agricultural Research Stations
- Sakha
- Serw

Animal Production Stations
- Sakha
- Serw
- Mehalet Mousa

Universities
- Tanta - Kafr El Sheikh

**WEST NORTH COAST**

- Agricultural Research Stations
  - Zahrzora
- Horticulture Stations
  - Sabahia
- Animal Production Stations
  - Borg El Arab
  - Montazah
- Universities
  - Alexandria
  - Helwan

**NEW LANDS**

- Agricultural Research Stations
  - Nubariya
- Horticulture Stations
  - Tahrir

## B. Regional Groupings for the Grants Program

- Assiut and Menya Universities for Middle and Upper Egypt and New Valley.

- Cairo and Cairo at Fayoum Universities for Fayoum, Beni Suef and Giza Governorates.

- Ain Shams and Al-Azhar Universities for Kalyoubiya and South Sharkiya Governorates and the Greater Cairo Zone.

- Mansoura, Menufiya and Kafr El-Sheikh Universities for the Middle Delta Zone.

- Zagazig, the Benha Branch at Zagazig and Suez Canal Universities and the Higher Institute of Efficient Production at Zagazig for the northern and eastern part of the East Delta Zone, the eastern part of the North Delta Zone, and the Sinai.

- Alexandria and Helwan Universities, the National Research Center and the Desert Development Center at AUC for the western part of the North Delta Zone, the West North Coast and the new lands from South Tahrir northward.

- The Desert Research Institute for other new land.

# Annex II

## NARP Research Grant Proposal Form

# NARP RESEARCH GRANT PROPOSAL FORM

A research proposal should accompany all requests for new or revised NARP funded research projects. Its preparation should be coordinated by the Principal Investigator and it should be approved by the involved Dean or comparable official. All proposals must be in English. Copies of the proposal should be provided to each senior researcher within all involved research units (such as Departments within universities), and to each involved Dean or comparable official. Five copies must be provided to the NARP Director General. Details relating to many sections are given in the introductory pages of this Manual.

Proposal No._____Date submitted_____

Institution submitting _____

Principal Investigator _____

Lead research unit _____

Project title _____

_____

_____

Proposed starting date _____Ending date _____

Objectives:*

Purpose, scope and justification:*

Previous recent work and present outlook:*

General statement of procedures and methods (please fill out the attached Workplan Summary Activity Chart for each involved Department or comparable research unit):*

Detailed procedures for the required months (see p.3 of the text) (Please review carefully the section entitled "Procedures and methods: Detailed scheme for research studies on crops" in the Manual text. Procedures should be described separately for each involved Department or comparable research unit.):*

Additional required forms are attached.

Submitted by: _____ Principal Investigator

Approved by: _____ Faculty Dean or comparable official

_____ Department

_____ Institution

* Add pages as needed.

WORKPLAN SUMMARY ACTIVITY CHART*

Institution ----------
Res. Unit or
Discipline ----------
Planned project life for this area of research (years) ----------
Planned starting date ---------- Planned completion date ----------

Major Activities

| Activity No | Description of activity | Expected duration (Months) |
|---|---|---|
| | | |

Activity time span+

| Activity No. | July - June fiscal years | | | | | |
|---|---|---|---|---|---|---|
| | 1987/88 | 88/89 | 89/90 | 90/91 | 91/92 | 92/93 |
| | | | | | | |
| Planned overall cumulative % completion | | | | | | |

* Use one or more sheets for each research unit or major discipline.
+ Use arrows (---> ) to indicate start (tail) and completion (head) for each activity.
For partial years, space out to show part of July-June year covered.

# INFORMATION SHEET FOR SENIOR RESEARCHERS*

Name _____

Title _____

Institution _____ Department _____

Office address _____

_____

Academic background:

| Degree | University | Location | Major field | Minor field |
|---|---|---|---|---|
| Masters | | | | |
| PhD | | | | |

Research experience (emphasize those parts that relate directly to the work to be done under NARP):

* One set of sheets must be filled out by the Principal Investigator and a senior researcher within each involved research unit and any collaborating institutions.

Experience (Con't.)

Percentage of time devoted to: Res. _____ Adm._____
Teaching _____. Has prior work involved direct farmer contacts?
Yes _____, No _____. If "Yes", what kind of contacts were involved?

_____ _____

_____

Title as a part of the NARP Project _____
Hours per week to be devoted to this Project _____
No. of publications. Technical _____ Popular _____
Refereed papers in professional journals _____.*

_____
Signature of researcher

Planned staff (Assistant lecturers or above) to work under you for the NARP Project:

| Name | Rank | Highest degree Level | Highest degree Year |
|---|---|---|---|

* Please attach printed abstracts for not to exceed 5 refereed papers, preferably from international journals.

NATIONAL AGRICULTURAL RESEARCH PROJECT
RESEARCH GRANTS PROGRAM
BUDGET SUMMARY BY JULY-JUNE FISCAL YEARS

Institution:_____ Res. Unit or Discipline:_____

| # | CATEGORY | 1987/88 | 1988/89 | 1989/90 | 1990/91 | 1991/92 | 1992/93 | GRAND TOTAL |
|---|---|---|---|---|---|---|---|---|
| I. | LABOR | | | | | | | 0 |
| II. | EXPENDABLE SUPPLIES | | | | | | | 0 |
| III. | TRAVEL, TRANSPORTATION, PER DIEM | | | | | | | 0 |
| IV. | REPAIR & MAINTENANCE | | | | | | | 0 |
| V. | INFORMATION DISSEMINATION | | | | | | | 0 |
| VI. | FACILITY IMPROVEMENT | | | | | | | 0 |
| VII. | MISCELLANEOUS | | | | | | | 0 |
| | TOTAL (£E) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| VIII. | ADMINISTRATIVE FEE (10% of the above total | | | | | | | |
| | GRAND TOTAL (£ E) | | | | | | | |

256

NATIONAL AGRICULTURAL RESEARCH PROJECT
RESEARCH GRANTS PROGRAM
BUDGET BREAKOUT BY QUARTER

Fiscal Year _____

Institution: _____

Res. Unit or Discipline: _____

| # | CATEGORY | 1ST QUARTER | | | TOTAL BY LINE ITEM |
|---|---|---|---|---|---|
| | | JUL. | AUG. | SEPT. | |
| I. | LABOR | | | | |
| II. | EXPENDABLE SUPPLIES | | | | |
| III. | TRAVEL,TRANSPORTATION,PER DIEM | | | | |
| IV. | REPAIR & MAINTENANCE | | | | |
| V. | INFORMATION DISSEMINATION | | | | |
| VI | FACILITY IMPROVEMENT | | | | |
| VII. | MISCELLANEOUS | | | | |
| | MONTHLY TOTAL ( L.E.) | | | | |

QUARTER TOTAL (L.E.) _____

397

NATIONAL AGRICULTURAL RESEARCH PROJECT
RESEARCH GRANTS PROGRAM
BUDGET BREAKOUT BY QUARTER

Fiscal Year _____ _____

Institution: _____

Res. Unit or Discipline: _____

| # | CATEGORY | 2ND QUARTER | | | TOTAL BY LINE ITEM |
|---|---|---|---|---|---|
| | | OCT. | NOV. | DEC. | |
| I. | LABOR | | | | |
| II. | EXPENDABLE SUPPLIES | | | | |
| III. | TRAVEL, TRANSPORTATION, PER DIEM | | | | |
| IV. | REPAIR & MAINTENANCE | | | | |
| V. | INFORMATION DISSEMINATION | | | | |
| VI. | FACILITY IMPROVEMENT | | | | |
| VII. | MISCELLANEOUS | | | | |
| | MONTHLY TOTAL (L.E.) | | | | |

QUARTER TOTAL (L.E.) _____

## ACADEMIC TRAINING - PHD DEGREES

| RIS | NO | FIELD OF STUDY | MAJOR EMPHASIS | TYPE | JUSTIFICATION |
|---|---|---|---|---|---|
| 14 | 1 | Family management and nutrition | Home economics subjects with empahsis on nutrition information, education and development of rural women | 1/2 | In this Institute staff need new training in management of technology transfer. They must learn the new methods and systems of discerning needs, collection and dissemination of new technology to the farmer and transfer of farmer knowledge back to the researcher. |
| 14 | 2 | Rural community organization | Rural development, structure, leadership and organization | 1/2 | |
| 14 | 3 | Technology transfer | Extension education and programming | 1/2 | |
| 15 | 1 | Pesticide resistance | Monitoring and determining pesticide residues in various biological media | 1/2 | Lack of institute trained staff in this area: Resistance phenomenon is the most biological limitation for successful pest control. Efforts must be directed towards delaying the occurence of resistance. Need staff able to identify biochemical defense mechanisms in resistant strains. |
| 15 | 2 | Pesticide residue amelioration | Study of new control means for minimizing resistance in cotton bollworm to insecticides. | 1/2 | Lack of institute trained staff in this area: Need a residue analyst trained to determine the persistence of pesticide residues in different crops and recomend the safety periods (pre-harvest intervals) from application to harvest time. |
| 16 | 1 | Biological evaluation of feed | Production of non-traditional protein concentrates for chick feed including biological evaluation of the products | 1/2 | This laboratory is a newly established laboratory and staff are not currently available. One of its functions is to analyze protein and feedstuff for certification of imported feed. Local feed must be certified. |
| 16 | 2 | Food microbiology | Production of single cell protein using farm waste and verifying the safety of food | 1/2 | |
| 17 | 1 | Applied Statistics in Agricultural Production | - Method of statistical experimentation<br>- Data collection and analysis of results<br>- Experimental design for crop production | 1/2 | Lack of trained staff in this area |
| 17 | 2 | Applied Statistics in Crop Breeding | - Method of statistical experimentation<br>- Data collection and analysis of results<br>- Experimental design for crop breeding<br>- Statistics in population genetics. | 1/2 | Lack of trained staff in this area |

NATIONAL AGRICULTURAL RESEARCH PROJECT
RESEARCH GRANTS PROGRAM
BUDGET BREAKOUT BY QUARTER

Fiscal Year _____

Institution: _____

Res. Unit or Discipline: _____

| # | CATEGORY | 4TH QUARTER | | | TOTAL BY LINE ITEM |
|---|---|---|---|---|---|
| | | APR. | MAY | JUN. | |
| I. | LABOR | | | | |
| II. | EXPENDABLE SUPPLIES | | | | |
| III. | TRAVEL, TRANSPORTATION, PER DIEM | | | | |
| IV. | REPAIR & MAINTENANCE | | | | |
| V. | INFORMATION DISSEMINATION | | | | |
| VI. | FACILITY IMPROVEMENT | | | | |
| VII. | MISCELLANEOUS | | | | |
| | MONTHLY TOTAL ( L.E.) | | | | |
| | | | | QUARTER TOTAL (L.E.) | |

400

## REQUEST FOR NEW OR RENOVATED FACILITIES+

Institution _____

Department or discipline _____

| Item No. | Desired completion date (show as x's in the involved columns) 1987/88 by quarters | | 88/89 | 89/90 | 90/91 | Should your part of the proposal be dropped if funding is not available |
|---|---|---|---|---|---|---|
| | 3rd | 4th | | | | Yes No * |

(List in order of priority)

+ Use one sheet for each Department or discipline that desires items on this form. If no items are desired by any group at your Institution, cross out the line for "Department or discipline" and write in large letters the word "None" in the large section above.
*If "No", please indicate below the effect on the research of this lack of funding and how you plan to complete or continue the research without this item.

### Details for Each Item

New facilities are restricted to screen houses, green houses, small field storage sheds and similar items **made from material produced in Egypt.** Sufficient justification should be given below for each item so that the NARP reviewers can appraise the need in relation to your proposed research area. Please indicate the desired (minimum) budget for each item. If somewhat more would be highly desirable, you could indicate this also, its added cost and why it is needed.

(Add pages as required)

401

# REQUEST FOR EQUIPMENT, FARM MACHINERY AND/OR VEHICLES+

Institution _____

Department or discipline _____

| Item No. | Desired delivery date (show as x's in the involved columns) | | | | Should your part of the proposal be dropped if funding is not available |
|---|---|---|---|---|---|
| | 1988/89 by quarters | 89/90 | 90/91 | 91/92 | |
| | 1 2 3 4 | | | | Yes No* |

(List in order of priority)

+ Use one sheet for each Department or discipline that desires items on this form. If no items are desired by any group at your Institution, cross out the line for "Department or discipline" and write in large letters the word "None" in the large section above.
*If "No", please indicate below the effect on the research of this lack of funding and how you plan to complete or continue the research without this item.

402

REQUEST FOR EQUIPMENT (CON'T)

## Details for Each Item

If approved, the NARP staff in Giza will arrange for purchase from NARP grant funds and make sure that involved USAID regulations are met. Sufficient justification should be given below for each item so that the NARP reviewers can appraise the need in relation to your proposed research area.

USAID approval to procure specified commodities must be based on an external certification regarding adequate maintenence and repair facilities as well as availability of personnel to properly operate, support and control the involved items. Before requesting such items, you should be sure that these conditions can be met.

All items will need to be purchased in the USA. Nine to twelve months or longer will be required for delivery. Please give as much detail as possible on the exact specifications involved. If you can attach literature on an item that would be satisfactory regardless of where made it will be most helpful in identifying an American-made equivalent. Purchase cost duty-free in Egypt or in the USA if known should be shown. Please indicate the source of this information. Be sure to specify dollars or L.E. The NARP staff will estimate shipping costs for purchases in the USA.

NARP is not designed to upgrade non-ARC research institutions except as a result of research conducted for NARP. Only items that specifically relate to the work proposed for NARP should be included here.

(Add pages as needed)..

## REQUEST FOR TRAINING IN OR TRIPS TO DEVELOPED COUNTRIES+

Institution _____

Department or discipline _____

| Item No. | Desired time period (show as x's in the involved columns) | | | | Should your part of the proposal be dropped if funding is not available |
|---|---|---|---|---|---|
| | 1988/89 by quarters | 89/90 | 90/91 | 91/92 | |
| | 1 2 3 4 | | | | Yes No * |

(List in order of priority)

+Use one sheet for each Department or discipline that desires items on this form. If no items are desired by any group at your Institution, cross out the line for "Department or discipline" and write in large letters the word "None" in the large section above.
*If "No", please indicate below the effect on the research of this lack of funding and how you plan to complete or continue the research without this item.

(Con't.)

404

## REQUEST FOR OUT-OF-COUNTRY TRIPS (CON'T)

### Details for Each Item

If approved, the NARP staff on training will handle details and make sure that involved USAID regulations are met. Sufficient justification should be given below for each involved trip so that the NARP reviewers can appraise the need in relation to your proposed research area.

If proposed participants for short-term training do not have an advanced degree from an English-speaking country, they likely will be required to take an English test at the American University in Cairo. Three outcomes are possible : (a) A high enough score to permit the travel, (b) Too low to permit travel but high enough to allow English training at AUC paid for by USAID. A new examination would be scheduled following this training, (c) Too low to permit training under USAID. Unless private English lessons were taken and a substantually higher score was made on a later examination, no trips would be allowed. Physical examination by a USAID doctor also must be passed to permit travel.

Requirements for "invitational travel", which might involve presenting a paper on NARP research at a professional meeting or workshop, are less restrictive. However, approval for each trip must be given by the USAID Director.

Trips under NARP should relate closely to the research being done for NARP. Please show here who or what institution(s) you wish to visit and why this is essential for your planned research. Time periods in days or weeks should be indicated.

(Add pages as needed)

## REQUEST FOR OUTSIDE CONSULTANTS+

Institution _____

Department or discipline _____

| Item | Desired time period (show as x's in the involved columns) | | | | Should your part of the proposal be dropped if funding is not available |
|---|---|---|---|---|---|
| | 1988/89 by quarters | 89/90 | 90/91 | 91/92 | |
| | 1 2 3 4 | | | | Yes No * |

(List in order of priority)

+ Use one sheet for each Department or discipline that desires items on this form. If no items are desired by any group at your institution, cross out the line for "Department or discipline" and write in large letters the word "None" in the large section above.
*If "No", please indicate below the effect on the research of this lack of funding and how you plan to complete or continue the research without this item

(CON'T)

406

REUEST FOR OUTSIDE CONSULTANTS (Con't.)

**Details for Each Item**

Sufficient justification should be given below for each person so that tne NARP reviewers can appraise the need in relation to your proposed research area. Also you must certify that the desired expertise is not available in Egypt. Please indicate for each consultant the exact area to be covered in relation to your research proposal and the number of days or weeks needed. If you have in mind a specific person, please indicate this and their present affiliation.

Waiver Control No. 87-51
(Competition- Sole Source)
September 9, 1987

ACTION MEMORANDUM FOR THE MISSION DIRECTOR

THRU: AD/AGR, William H Janssen

FROM: AGR/A, Carl W. Lawhead

SUBJECT: Waiver for a Sole Source Contracting under the National Agricultural Research Project (263-0152)

Issue:

Your approval is requested for a blanket waiver covering up to ten single source negotiated contracts for collaborative research programs between the Ministry of Agriculture (MOA) and selected International Agricultural Research Centers. The estimated value for each of the proposed contracts is not more than $500,000 over a six-year period.

Discussion:

A. Background. The National Agricultural Research Project (NARP) Agreement was signed on September 12, 1985. The project's purpose is to develop the capability of the Egyptian agricultural research community to provide a continuous flow of improved, appropriate agricultural technology. One of the project's stated outputs is "a coordinated and collaborative agricultural research community." The NARP Project Paper envisaged collaborative research programs between the MOA and International Agricultural Research Centers (IARCs). The research findings should be of utility to both parties. The Project Paper states:

> The purpose of the project . . . will be achieved when Egyptian scientists are able to apply basic research available through the International Agricultural Research Centers (IARCs) to Egyptian conditions. Emphasis in the first years of the project will be on adaptive research. Some of the top scientists, however, will do basic research in collaboration with the specialized IARCs such as the International Center for Agricultural Research of Dry Areas (ICARDA) or the International Center for Research in the Semi-Arid Tropics (ICRISAT). (NARP Project Paper at pages 10-11.)

To permit the first of these collaborative research programs to be established, in August 1987, the Mission approved a waiver, authorizing the MOA to negotiate with ICARDA as a sole source supplier of services. This first program will be the model for establishing all subsequent collaborative programs. As a first step, the MOA and ICARDA have developed a Memorandum of Understanding (see attachment) which sets the broad perimeters for the program. This will be followed in October by the development of a host country contract which will include a work plan, scope of work, and budget. Handbook 11 will be followed for the contract approval and execution.

Within the next 12 months, the MOA is proposing to establish a collaborative research program with each of the following institutes: (1) the International Center for Agricultural Research in the Dry Areas (ICARDA), (2) the International Maize and Wheat Improvement Center (CIMMYT), (3) the International Center for Research in the Semi-Arid Tropics (ICRISAT), (4) the International Service for National Agricultural Research (ISNAR), (5) the International Potato Center (CIP), (6) the International Livestock Center for Africa (ILCA), (7) the International Laboratory for Research on Animal Diseases (ILRAD), (8) the Asian Vegetable Research and Development Center (AVRDC), (9) the International Fertilizer Development Center (IFDC), (10) the International Center for Living Aquatic Resources Management (ICLARM), and (11) the International Center for Insect Physiology and Ecology (ICIPE).

These MOA selected Centers are on the list of 20 IARCs which the AA for S&T has determined should be considered of U.S. nationality in accordance with Handbook 1B, Chapter 5, Section 5D2; thus, the proposed programs require no "nationality" waiver. Each of the proposed collaborative research programs will require a host country contract. The proposed collaborative research programs should solve problems which are of mutual MOA/IARCs interest.

The selected Centers which are actively supported by AID form a world-wide network of specialized research relevant to Egyptian agricultural development. The Centers are internati lly acknowledged as leaders in their fields of expertise and offer less developed countries the opportunity to establish collaborative research programs of mutual benefit to the Centers and the recipient country. As such, the selected International Agricultural Research Centers are an important resource that the MOA may use through a collaborative research

program mode. The mutually beneficial research programs will enhance the research capabilities of Egypt's senior scientists by involving them as co-equal research partners with the Research Centers' internationally recognized experts. Involvement with the International Centers will break down parochial barriers and integrate the MOA's Agricultural Research Center into the international research community.

The NARP Project Paper identified the need for collaborative research programs with the International Agricultural Centers. This project component continues to be essential to the improvement of the overall quality of the MOA's research. With hindsight, we believe the NARP implementation plan should have identified the International Agricultural Research Centers with which sole source collaborative research agreements were needed to fulfill the NARP's objectives and special design requirements. This waiver updates the PP's implementation plan by identifying the IARCs/collaborative-research-programs which are necessary for the Project.

B. Justification. The NARP project design includes several components, one of which is to finance collaborative research between the MOA and International Agricultural Research Centers. While organizations other than the selected IARCs may have the capability to provide technical assistance for agricultural research, no other U.S. organizations offer collaborative research programs as envisioned by the NARP. Moreover, no other organizations have the IARCs' international stature or are as well-suited to integrating Egypt's MOA into the international research community.

At this time, the precise research topics for the collaborative programs cannot be identified. Through a Memorandum of Understanding, such as the one attached, the research topics will be jointly agreed upon by the MOA and each of the Centers as an initial step in their collaboration. This will be followed by a host country contract with a precise scope of work and budget. The research will be conducted in Egypt. The IARCs will provide their scientists for the collaborative programs at no cost to the MOA or the NARP. The MOA will provide the research experimental plots and operating funds as well as logistical arrangements for the IARC scientists who visit Egypt to plan and execute the jointly agreed upon research. Although the collaborative research will be designed to solve Egyptian problems, the research will have potential application throughout each Center's area of responsibility.

We have stressed to the MOA that the proposed IARC contracts should only finance the costs of collaborative research and not technical assistance services or training. The proposed contracts will not finance the salaries of IARCs' personnel who participate in the mutually beneficial research programs. Thus, the proposed collaborative research contracts will finance only (1) international travel and per diem for participating scientists, (2) equipment and materials which are necessary to accomplish the research but are not available from the MOA, and (3) cost of publications that result from the collaborative research. Under NARP, any necessary technical assistance for agricultural research will be financed through the on-going contract with the Consortium for International Development and training will be financed by the proposed training contract for which the MOA is preparing an RFTP.

Each proposed collaborative program will modeled after the U.S. Land Grant Universities' Title XII Collaborative Research Support Programs (CRSPs). Through the CRSPs, the participating Universities are non-competitively employed under AID projects as will be the selected IARCs if this waiver is approved. Note that the Mission has already authorized MOA negotiations with the ICARDA as a sole source supplier of services for establishing the NARP's first collaborative research program. This waiver simply expands that authorization to include CIMMYT, ICRISAT, ISNAR, CIP, ILCA, ILRAD, AVRDC, IFDC, ICLARM, and ICIPE.

C. Waiver Criterion. The reason for waiving competitive procedures for the negotiations of the proposed contracts is due to NARP's special design and operational requirements for collaborative research programs in agriculture as called for in the NARP Project Paper. According to Handbook 11, Chapter 1, Section 2.4.2.a.2, competition in the procurement of services may be waived and negotiation with a single source authorized if special design or operational requirements require services available from only one source. Application of this criterion to the facts at hand is, we believe, amply shown above.

Authority:

Paragraph 8 of Delegation of Authority No. 653, authorizes the Mission Director to approve waivers for procurement of services under host country contracts on a sole source negotiated basis without dollar limitation.

411

Recommendation:

It is recommended that you authorize negotiations with the above named IARCs as a sole source suppliers of services for the proposed MOA/IARC collaborative research programs. The value of each proposed host country contract shall not exceed $500,000 over a six-year period.

Approved: *

Disapproved: _____

Date: _____

Clearances:
DOD/AGR/A: JFoti
LEG: MWilliams
PPP/P: DDuLavey
DDIR: GLaudato

Non Competitive Review Board:
AD/LEG: KO'Donnell
IS/CS/OD: JDzierwa
DR/PS: JStarnes

Drafted by: AGR/A: CWLawhead:sk
Doc No. 652sk

*provided AID review and approve some type of plan for working with the centers as well as for the work of an individual center under a proposed contract.

MDBrown
9/15/87

* provided AID review and approve some type of plan for working with the Centers as well as for the work of an individual center under a proposed contract. Suzanne G. Brown 9/15/87

412

# MEMORANDUM OF UNDERSTANDING

## BETWEEN THE
## MINISTRY OF AGRICULTURE AND LAND RECLAMATION
## THE ARAB REPUBLIC OF EGYPT

## AND THE
## INTERNATIONAL CENTER FOR AGRICULTURAL RESEARCH IN THE DRY AREAS

This Memorandum of Understanding is between the Ministry of Agriculture and Land Reclamation, Arab Republic of Egypt (hereinafter called the "MINISTRY") and the International Center for Agricultural Research in the Dry Areas (hereinafter called "ICARDA").

WHEREAS, the MINISTRY is interested in addressing the shortage of food through the development of a collaborative research program, incorporating an interdisciplinary approach, in the Arab Republic of Egypt (hereinafter called "EGYPT");

And WHEREAS, the MINISTRY wishes to further develop the research and training facilities at Sids (hereinafter called "SIDS");

And WHEREAS, the GOVERNMENT OF EGYPT and ICARDA have previously signed an Agreement, which was published in the *Official Gazette* Number 4 dated January 22, 1981, for the improvement of agricultural production in Egypt;

And WHEREAS, the MINISTRY and ICARDA have already cooperated in activities of mutual interest during the implementation of the Nile Valley Project;

And WHEREAS, the MINISTRY and ICARDA have continuing mutual interest in fostering collaborative research in EGYPT:

NOW, THEREFORE, the MINISTRY and ICARDA, inspired by their common objectives to promote and accelerate research on food legumes, pasture/fodder, barley, wheat (in collaboration with the CENTRO INTERNACIONAL DE MEJORAMIENTO DE MAIZ Y TRIGO, hereinafter known as "CIMMYT"), and livestock, have reached a mutual understanding to cooperate as set forth in the following articles.

## ARTICLE I.

The following collaborative activities have been agreed to by the MINISTRY and ICARDA:

1) To prepare a Diagnostic Survey of the different agroecological zones in order to identify the problems and constraints to increased production in food legumes, pasture/fodder, barley, wheat (in collaboration with CIMMYT) and livestock;

2) To collect crop germplasm from the dry areas of Egypt in order to preserve, evaluate and determine its best utilization;

agree, ICARDA will provide: (1) specialized short duration courses at ICARDA facilities; (2) specialized in-country short courses; (3) graduate research training (both M.Sc. and Ph.D. levels) at ICARDA jointly with Egyptian and other universities; (4) post doctoral work at ICARDA facilities; (5) visiting scientists programs at ICARDA facilities for Egyptian researchers; and, (6) participation of Egyptian researchers in planning meetings, regional and international seminars and conferences.

The MOA and ICARDA will mutually agree on a Plan of Work reflecting the above areas of interest. It will be updated at least annually.

## ARTICLE II.

It is the intention of the MINISTRY and ICARDA that this Memorandum of Understanding will result in a contract for the execution of the Plan of Work. The contract will be between the MINISTRY and ICARDA and will be funded from the National Agricultural Research Project (hereinafter called "NARP"). It is understood that this contract is subject to the approval of the United States Agency for International Development (hereinafter called "USAID") for financing, the donor agency for NARP.

## ARTICLE III.

Implementation of this Memorandum of Understanding between ICARDA and the MINISTRY shall be through the Director General of NARP and the Director General of ICARDA, using the local Cairo office of ICARDA as the focal point.

3) To develop an efficient Farming Resources Management Program (hereinafter called "FRMP") for various agroecological zones through a collaborative research program;

4) To develop SIDS as a center for research and training ; and,

5) To develop and deliver appropriate training programs for MOA researchers.

The key elements of the Plan of Work to accomplish these activities will be:

1) Develop and assist in the implementation of the most favorable combinations of production practices and evaluate their economic return on farmers' fields in various agroecological zones;

2) Spread improved practices among farmers through the Subject Matter Specialists (hereinafter called "SMS") and extension agents and, plan and conduct large scale field demonstrations using improved production systems adapted for each agroecological zone; and,

3) Use all of the educational means available to disseminate new information to the farmers.

ICARDA shall provide the services of short-term experts and use of ICARDA facilities by staff of the MINISTRY as agreed with the MINISTRY.

ICARDA will develop and conduct specific research and training courses as agreed with the MINISTRY. In addition, as MOA and ICARDA mutually

## ARTICLE IV.

1. The MINISTRY and ICARDA may by mutual consent add, modify, amend or delete any words, phrases, sentence or articles in this Memorandum of Understanding.

2. The Memorandum of Understanding shall be effective until either party serves notice on the other of its intention to terminate it, in which event the Memorandum of Understanding will stand terminated at the end of six calendar months from the date of issue of such notice, unless the parties mutually agree to another period.

IN WITNESS WHEREOF, the MINISTRY and ICARDA have affixed their signatures.

Executed in duplicate at Cairo, Arab Republic of Egypt, on the _____ day of _____, 1987, in the English language.

For the Ministry of Agriculture and Land Reclamation

Dr. Youssef Amin Wally
Deputy Prime Minister and
Minister of Agriculture and
Land Reclamation

For the International Center for Agricultural Research in the Dry Areas

Dr. Mohamed A. Nour
Director General

417

## Research Component's

## Technical Assistance Contracts

The research component currently has three technical assistance contractors: the Consortium for International Development (CID), the International Rice Research Institute (IRRI), and the International Science and Technology Institute (ISTI). These contracts total $16.9 million and are valued at $12.5 million, $4.0 million, and $0.4 million, respectively.

### 1. Consortium for International Development

CID is the primary TA contractor providing most of the component's long- and short-term advisors. The purpose of the CID TA is to assist the ARC in improving the management of its research programs in order to generate improved agricultural technology for farmers. These consultant services are directed primarily at the ARC but are intended to encompass the total research community. The CID resident advisors and their period of residency are as follows:

| Advisor | Years of Residency |
|---|---|
| Chief of Party | 6 |
| Research Station Management | 4 |
| On-Farm Research & Demonstration | 5 |
| Research (Grants) Studies | 6 |
| Administrative Services | 6 |
| Interdisciplinary Research | 3.5 |
| Library & Information Science | 2 |
| Crop Protection | 4 |
| Training & Manpower Development | 2 |
| Agricultural Mechanization | 4 |
| Seed Technology | 3 |

Seventy eight person-months of short-term TA is also available under the CID contract. In addition, the contract provides for 270 person-months of support staff. Based on approval of the NARP Project Paper Amendment No. 2, this host country contract is expected to be amended to provide residency extensions so that all of the above advisors remain in-country through out the life of the contract and to add two additional resident advisors for three years each. One of the new advisors will be a Project Coordinator who will provide the same services which are due to terminate in September 1988 that are currently being provided by ISTI (see item 3 below), and the other new advisor will be an Aquaculture Specialist who will assist in making the research facilities at Abassa (constructed under the AID-financed Aquaculture Development Project) fully operational. The Aquaculture Specialist is expected to reside at Abassa.

### 2. International Rice Research Institute

The IRRI has country contract is designed to assist in making the rice research facilities at Sakha which were constructed under the

AID-financed Rice Research and Training Project fully operational. The contract provides 138 person-months for three resident advisors: Program Manager, Rice Breeder, and Rice Pathologist and 48 person-months for short term TA. In addition, the IRRI contract provides for $722,400 of rice-related training and $572,760 of field-supply-type commodities.

3. International Science and Technology Institute

The ISTI AID-direct contract provides for a two-year (September 1986 - September 1988) resident advisor for the research component's administrative unit. This advisor is designated as the Project Coordinator and is assisting the ARC Project Director in coordinating and monitoring the project's activities. The services include (1) data management for research monitoring, (2) a liaison among the principal project administrators, researchers, and AID, and (3) establishment and maintenance of a computer-based project implementation tracking system. Since these services will be needed for three years after the ISTI contract terminates in September 1988, they are expected to be provided by CID through a contract amendment as mentioned above.

## DISTRIBUTION

| NO. | | |
|---|---|---|
| 6 | Dr. Ahmed Momtaz | Director General, NARP |
| 1 | Dr. Robert Witters | Chief of Party, CID/NARP TA Team |
| 1 | Dr. Yehia Hassan | Chairman, Foreign Agricultural Projects Committee |
| 1 | Dr. A. Shehata | Director, ARC |
| 1 | Dr. M. Sattour | Deputy Director, ARC |
| 1 | Dr. Abdallah Nassib | Director, Field Crops Research Institute |
| 1 | Dr. Samir Moustafa | Director, Cotton Research Institute |
| 1 | Dr. Ahmed Nour | Director, Sugar Crops Research Institute |
| 1 | Dr. Kamla Mansour | Director, Horticulture Research Institute |
| 1 | Dr. Moustafa Hathout | Director, Animal Production Research Institute |
| 1 | Dr. Hosny El-Sawah | Director, Animal Health Research Institute |
| 1 | Dr. Sayed A. Salama | Director, Veterinary Serum & Vaccine Research Institute |
| 1 | Dr. M. Sabry Tawfik | Director, Animal Reproduction Research Institute |
| 1 | Dr. Ahmed El-Sehrigi | Director, Agricultural Mechanization Research Institute |
| 1 | Dr. Youssef A. Hamdi | Director, Soils and Water Research Institute |
| 1 | Dr. Taha El-Sharkawi | Director, PLant Pathology Research Institute |
| 1 | Dr. Ahmed Khattab | Director, Plant Protection Research Institute |
| 1 | Dr. Mohamed Sharaf | Director, Agricultural Economics Research Institute |
| 1 | Dr. Ahmed El-Rafei | Director, Agricultural Extension and Rural Development Research Institute |
| 1 | Dr. Zakaria El-Attal | Director, Central Agricultural Pesticides Lab |
| 1 | Dr. Ahmed Abdel Halim | Director, Central Laboratory for Statistics |
| 1 | Dr. Akila Salleh | Director, Central Lab for Food and Feed |
| 1 | Dr. Ismail Darrag | Director, Agricultural Research Stations |
| 1 | Eng. Ali Nashaat | Secretary General, ARC |
| 1 | Dr. Abdurabbo Ismail | Director, Specialized Extension, ARC |
| 1 | Dr. Alaa Eldin Z. Bondok | Head, Central Administration for Minister's Office, MOA |
| 1 | Dr. Adel El-Beltagi | Head, Central Administration for Minister's Office, MOLR |
| 1 | Acc. Kamal Reda | Head, Financial and Administrative Affairs Sector, MOA |
| 1 | Eng. Adel Ezzi | Chairman, Agriculture Development and Credit Bank |

| | | |
|---|---|---|
| 1 | Dr. Abdel Salam Gomaa | Head, Central Administration for Seeds, MOA |
| 1 | Dr. Yassin Osman | Head, Central Administration for Pest Control, MOA |
| 1 | Eng. Mohamed Dessouki | Head, Central Administration for Agricultural Foreign Relations, MOA |
| 1 | Dr. A. Moneim Barakat | Head, Central Administration for Animal Health, MOA |
| 1 | Eng. Mahmoud Nour | Supervisor, Central Administration for Planning, MOA |
| 1 | Eng. Abdel-Razik Badawy | Head, Central Administration for Animal Production, MOA |
| 1 | Eng. Fouad Abo-Hedb | Chairman, West Nobaria Company |
| 1 | Dr. Ibrahim Antar | NARC Member |
| 1 | Dr. Ahmed Abdel-Rahim | Technical Trusteeship for Research Institutes, ARC |
| 1 | Dr. Mahmoud El-Barkouki | NARC Member |
| 1 | Dr. Bakir Oteifa | Chairman, Grant Program Working Group |
| 1 | Eng. Aly Salem | Chairman, Construction Working Group |
| 1 | Dr. Hassan Khedr | Chairman, Data Collection Working Group |
| 1 | Dr. Yeldez M. Ishaq | NARP News |
| 1 | Dr. Mohsen El-Didi | NARP News |
| 1 | Eng. Aly Abo-Gazia | Chairman, Horticulture Crops Exporters Union |
| 1 | Mr. Cory Wengreen | Administrative Services Advisor |
| 1 | Dr. Willis McCuistion | Interdisciplinary Research Advisor |
| 1 | Dr. Ralph Finkner | Research Station Management Advisor |
| 1 | Dr. Gordon Beckstrand | On-Farm Research and Demonstration Advisor |
| 1 | Dr. Amir Khan | Agricultural Mechanization Advisor |
| 1 | Dr. Robert Harwood | Integrated Crop Protection Advisor |
| 1 | Dr. Bill Gregg | Seed Technology Advisor |
| 1 | Prof. Richard Foote | Research Studies Coordinator |
| 1 | Dr. Susan Emerson | Library and Information Services Specialist |
| 1 | Ms. Coleen Brown | Training and Manpower Development Advisor |
| 6 | Mr. John Foti | AID/NARP Project Officer |
| 2 | Dr. H. Matteson | CID/NARP Project Director, NMSU |
| 2 | Dr. Earl Kellogg | CID Executive Director |
| 20 | ARC Libraries | Director General Office |

# PUBLICATIONS

| PUBLICATION TITLE | PUBLICATION NO. |
|---|---|
| - Progress Report<br>CID, Progress Report for Period<br>(November 6, 1986 through January 6, 1987)-------- | 1 |
| - Quarterly Report<br>(January 1 through March 31, 1987)---------- | 2 |
| - Implementation Workshop - Proceedings<br>(February 9 - 17, 1987) ---------- | 3 |
| - Quarterly Report<br>(April - June, 1987) ---------- | 4 |
| - Life of Project Plan<br>(September, 1987)---------- | 5 |
| - Implementation and Financial Plan, Fiscal Year 1987-1988<br>September, 1987---------- | C |

422

# Annex III

## NARP PROJECT EVALUATION FORM

5. Explain how the experimental methods (materials, samples, measurement criteria, etc.) provide reliable and interpretable results? Will economic evaluations be possible? Is information needed on additional variables? Are all items proposed for collection needed or could some be dropped? Please discuss each item.

6. Discuss whether the investigators appear to have scientific competency essential to complete the research.

7. Will the project likely contribute significantly to new knowledge in the discipline and/or encourage interdisciplinary research? If so, describe how this will be done.

8. When you have completed the above, please provide your best numerical score for the attached scorecard.

In addition to your response to specific questions #1-5 above, reviewer comments are solicited on the following:

a. Suggest possible additional cooperative interdisciplinary research that might be established within and/or outside the submitting institution via this proposed research beyond that already indicated in the proposal.

b. Add relevant comments and suggestions for the improvement of any deficiences deemed to be important. Should the proposal be sent back for revision? If so, please indicate under "Recommended action" at the top of page 1 the words "Return for revision" and enter on a separate paper the kinds of revisions recommended.

c. Should the proposal be dropped? If so, write "Recommended for non-funding" under "Recommended action." This could reflect one or more of the following:

- A low overall score, with no easy way to revise.
- Lack of facilities to do the work.
- Proposal relates to a commodity or area of little economic importance in Egypt.
- No significant results can be expected within the timeframe of NARP.
- Too theoretical to be funded by NARP.
- Duplicates work in ARC or by NARP staff.
- Fails to relate closely to NARP objectives.
- Circumstances make the research undesirable at this time.
- Etc.

If to be non-funded, please provide a brief writeup of the reasons.

425

# NARP PROJECT PROPOSAL SCORE CARD

| Topic | Explanation | Max. Score | Assigned Score |
|---|---|---|---|
| Interdisciplinary nature | A 0 means only one discipline If more than one is involved, show 2 points for each. Five are required for the maximum of 10 points | 10 | |
| Duplication of other research | Does this duplicate or repeat prior or other on-going research? If it is mainly adaptive and is new in this zone, it can be considered as new research 5 implies no duplication; 3 would be partial duplication, 0 would be complete duplication and no justification for further work | 5 | |
| Extends prior research | There is an advantage in building on prior research. 5 implies substantial prior work and a potential for significant gain from this extension 0 implies no prior work or no anticipated gain from the new work | 5 | |
| Problem oriented with high potential for gains | Gains may relate to national welfare such as import substitution or to high net benefits to farmers who use the results. A 20 implies strong problem orientation with a high potential for desired gains | 20 | |
| Substantial progress can be made within proposed time period | Emphasis under NARP is on adaptive rather than basic research A 15 implies a potential for significant findings of benefit as noted above by Project termination. A 0 could imply expected research progress but no results of immediate benefit. | 15 | |

426

| | | |
|---|---|---|
| Topics to be covered are economically important within the Zones(s) or nationally depending on the nature of the proposal | This may relate to current importance or potential over the next 5-10 years. Importance may relate mainly to the economic value of commodities being studied or the problem or constraint. A 15 implies a substantial increase in total net farm income from the geographic area to which the research applies if the research is successful and the results are adopted by farmers | 15 |
| Institution staff are believed to be competent to carry out the research | A 5 implies high competence for problem oriented adaptive research. A 0 could imply competence in the field but a lack of ability to deal with applications for farmers. | 5 |
| Budget seems reasonable in relation to anticipated results | A 5 implies significant results from a modest budget, taking account of both the operational budget and any requests for capital equipment and/or training. A 0 implies a budget that is much too high relative to anticipated results. | 5 |
| The institution is believed to have adequate facilities for the research | NARP does not plan to finance basic equipment. Thus, basic facilities, including research plots with needed irrigation, must be in place. Highly specialized items needed for the specific research to be undertaken may be funded. | 10 |
| On-farm trials or other direct farmer contacts are planned | A 10 implies that much of the research will involve farmer testing before project termination. A 5 implies farmer testing for about half of the research findings. | 10 |
| | Total | 100 |

127

## Overall Comment

When evaluation committees are involved, each member of the Committee could fill out a form. These then could be averaged and the results discussed. Agreement would then be reached on a final score. If preferred, oral discussion could be used to agree on the final score.

If the overall review is favorable, please write "Accept" at the top of page 1 under "Recommended Action". The overall total score also should be entered at the top of page 1. See page 2, b or c, for other possible actions.

# Annex IV

## NARP RESEARCH GRANT CONTRACT

# NARP RESEARCH GRANT CONTRACT

This contract is between:

NARP (1st party)
represented by : Project Director General
Address : Ministry of Agriculture and Land Reclamation, Giza, Egypt

Research Institution (2nd party):

Address :

The contract period begins on _____ and ends on _____.
The first party appoints the second party to carry out the activities described in the attached Project, grant no. _____ .

Project Title _____

_____

_____

Principal Investigator _____

Deputy Principal Investigato.* _____

Other Senior Staff _____

_____

_____

Duration _____ year(s)

Requested Operational Budget _____ L.E.

The terms and conditions of the contract are established as follows:

* Will become Principal Investigator if the initial Principal Investigator is unable to serve over an extended time during the grant period.

430

1. Purpose of the Contract

   The activities of the second party must be designed to solve problems and integrate knowledge which is important to and within the guidelines of the first party which is to increase and improve the production of Egypt's major agricultural commodities, e.g. major field and horticultural crops, livestock and fisheries, through research programs some of which may involve direct work with farmers.

2. Terms of the Contract

   These are outlined in detail in the Manual for Grant Research Under NARP and the attached NARP Grant Program Contract Management Information. The Principal Investigator and the Senior Official for the Cooperating Institution hereby certify that they have read these two documents and that all actions under this Contract will conform to these provisions.

3. Receipted Expenditures to Equal the Budget

   Expenditure receipts must be filed with the NARP Executive Office on a monthly basis. Should they be consistently below budget for any given 6-month period, NARP reserves the right to negotiate a revised budget over the life of the project that is consistent with actual expenditures. Such negotiations will be conducted between a representative of NARP and the Principal Investigator.

4. Termination of Contract

   The performance of work under this contract may be terminated by either party if a written notice of not less than 60 days is given by either party and by nonperformance as defined in the Grants Manual.

5. Ownership of Data, Reports, Plant Material, and/or Germplasm

   All documents, data, reports, plant material and/or germplasm prepared by the second party produced wholly or partially with funds from this grant become the property of the first party.

6. The attached NARP Grant Program Contract Management Information shall be an integral part of this Contract.

WE HEREBY AGREE TO THE TERMS AND CONDITIONS OF THIS CONTRACT:

| NARP | Cooperating Research Institution |
| --- | --- |
| Project Director General | Senior Official |
| Chairman, Grant Program Working Group | Principal Investigator |

# NARP GRANT PROGRAM
# CONTRACT MANAGEMENT INFORMATION

NARP Grant Contracts are funded by a cost reimbursable accounting system. Grantees will only be reimbursed for costs incurred in performing services as per the terms of this contract and in accordance with the applicable provisions found below under "General Provisions".

Within the grand total of the operational budget, grantees may increase or decrease any of the line items (other than that for Facility Improvement) contained in their proposed budgets as needed for the performance of the work.

Funds not expended from the budget for any month can be made available for use in subsequent months. This provision, however, may be overridden by Item 3 in the Contract.

## GENERAL PROVISIONS

1. Limitation of Cost

   NARP will not reimburse the grantee for costs in excess of the total approved budget, unless this contract is formally amended.

2. Operations

   a. Approved Per Diem will be reimbursed at rates that have been established by the NARP Director General.

   b. Contract budgets will be funded in L.E. currency only. This will eliminate any problems which might arise because of varying exchange rates for L.E. currency in relation to USA dollars.

   c. Car rental expenditures for work related activities are reimbursable, **if approved in advance, and the receipt signed/approved by the principal investigator.** Rental costs will not be accepted for project use of <u>personal</u> vehicles.

   d. Operating procedures for handling expenditure receipts and providing cash advances for operations will be established by the NARP Executive Office in a manner that is consistent with related provisions in the Manual.

3. Procurement

   a. Procurement of any items for use under this contract must comply with USAID and Egyptian regulations.

b. Grantees cannot buy anything made in an "Eastern" (Communist) country or anything with any component made in such countries.

c. Priority of purchasing must be given to public sector companies if possible.

d. Purchasing of items not exceeding 100 L.E. can be done directly by the involved staff.

e. Purchasing of items exceeding 100 L.E. but not exceeding 500 L.E. can be done directly with the written approval of the principal Investigator.

f. Purchasing of items exceeding 500 L.E. but not exceeding the L.E. equivalent of 500 USA dollars per item must be done through bids. Offers must not be less than three and prices should be included. Offers must be submitted in a form showing the reasons for choosing the item to be purchased. The list must be signed by the Principal Investigator and attached to the purchase order.

g. All approved equipment costing more than the L.E. equivalent of 500 USA dollars per item will be purchased in the USA through the NARP Executive Office. Funds for such equipment purchases are <u>not</u> part of this contract. They will be purchased from a separate NARP Grant Program budget.

h. All expenditure vouchers (documents) of the purchase invoices and examining records must be sent at the end of each month to the NARP Executive Office for reconciliation.

i. If the grantee wants to purchase anything from a "Western" country (other than the USA) that has to be imported directly, a waiver must be obtained from USAID/Egypt. These are nearly impossible to obtain unless it is proven that the item is not produced in the USA.

j. If items are bought without following the regulations stated in this contract, the purchase will be disallowed by auditors. The person who authorized the purchase will have to reimburse NARP for the disallowed expenditure.

k. If equipment owned by other Departments is used, maintenance of such equipment can be paid by contract funds during the period of project use <u>only</u>.

4. Payments to Principal Investigators

No payments for services rendered can be made from USAID funds to any of the Principal Investigators or other permanent professional staff under the Grant Program either from their Project or from any other NARP Grant Project. If such payments were identified by the NARP accountants, all of the involved Projects and related contracts would be terminated immediately and any remaining funds would be transferred to other Projects. Under the laws of the USA Government, such payments must be made by the host

country. Payments for wages are allowed and may be used to support Graduate Assistants.

5. Administrative Fee

A ten percent administrative fee will be paid to the Faculty which employs the Principal Investigator (or comparable administrative unit) on total expenditures in L.E. under each project. Budget forms provide a line for this item.

At the end of each fiscal year quarter, after receipts have been provided for all projects at your institutions, a cheque will be sent to the involved senior official equal to ten percent of total expenditures for the quarter for which proper receipts have been provided.

**NATIONAL AGRICULTURAL RESEARCH PROJECT**
(263 0152)
AMENDMENT NO. 2

RESEARCH COMPONENT
COST ESTIMATE
($000)

PROJECTION OF EXPENDITURES BY FISCAL YEARS

| | ACTUAL THRU FY88 | | FY89 | | FY90 | | FY91 | | FY92 | | FY93 | | FY94 | | TOTAL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | TOTAL |
| **TECHNICAL ASSISTANCE** | 3,226 | 672 | 1,965 | 360 | 2,403 | 396 | 2,028 | 396 | 1,863 | 396 | 1,680 | 360 | 1,680 | 360 | 14,845 | 2,940 | 17,785 |
| LONG TERM | 3,136 | 672 | 1,680 | 360 | 1,848 | 396 | 1,848 | 396 | 1,848 | 396 | 1,680 | 360 | 1,680 | 360 | 13,720 | 2,940 | 16,660 |
| SHORT TERM | 90 | 0 | 285 | 0 | 555 | 0 | 180 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 1,125 | 0 | 1,125 |
| **TRAINING** | 1,089 | 747 | 874 | 1,145 | 2,900 | 1,244 | 2,900 | 1,144 | 2,960 | 1,144 | 2,900 | 1,144 | 937 | 1,000 | 14,560 | 7,568 | 22,128 |
| LONG TERM | 1,089 | 0 | 621 | 0 | 2,295 | 144 | 2,295 | 144 | 2,355 | 144 | 2,295 | 144 | 585 | 0 | 11,535 | 576 | 12,111 |
| SHORT TERM | 0 | 747 | 253 | 1,145 | 605 | 1,100 | 605 | 1,000 | 605 | 1,000 | 605 | 1,000 | 352 | 1,000 | 3,025 | 6,992 | 10,017 |
| **COMMODITIES** | 270 | 0 | 5,575 | 1,068 | 17,194 | 83 | 5,008 | 0 | 300 | 0 | 250 | 0 | 250 | 0 | 28,847 | 1,151 | 29,998 |
| OFFICE EQUIPMENT/SUPPLIES | 0 | 0 | 1,014 | 150 | 360 | 83 | 250 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,624 | 233 | 1,857 |
| VEHICLES | 270 | 0 | 0 | 0 | 7,897 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8,167 | 0 | 8,167 |
| AQUACULTURE EQUIP./SUPPLIES | 0 | 0 | 0 | 0 | 80 | 0 | 258 | 0 | 50 | 0 | 0 | 0 | 0 | 0 | 388 | 0 | 388 |
| LIBRARY EQUIPMENT | 0 | 0 | 1,068 | 682 | 750 | 0 | 250 | 0 | 250 | 0 | 250 | 0 | 250 | 0 | 2,818 | 682 | 3,500 |
| FARM EQUIPMENT | 0 | 0 | 1,793 | 236 | 1,223 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3,016 | 236 | 3,252 |
| LAB EQUIPMENT AND SUPPLIES | 0 | 0 | 1,700 | 0 | 6,884 | 0 | 4,250 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12,834 | 0 | 12,834 |
| **SERVICES** | 250 | 4,070 | 2,482 | 7,827 | 7,630 | 11,417 | 7,580 | 9,832 | 4,380 | 7,814 | 3,570 | 2,340 | 2,330 | 1,860 | 28,222 | 45,160 | 73,382 |
| MAINTENANCE | 0 | 0 | 500 | 700 | 1,400 | 900 | 1,000 | 500 | 0 | 500 | 0 | 500 | 0 | 500 | 2,900 | 3,600 | 6,500 |
| RENOVATION | 0 | 0 | 0 | 500 | 0 | 3,210 | 0 | 2,822 | 0 | 3,000 | 0 | 0 | 0 | 0 | 0 | 9,532 | 9,532 |
| LAND IMPROVEMENT | 0 | 0 | 0 | 2,002 | 1,000 | 2,002 | 0 | 2,002 | 0 | 994 | 0 | 0 | 0 | 0 | 1,000 | 7,000 | 8,000 |
| COMMUNICATIONS | 0 | 0 | 0 | 200 | 0 | 200 | 0 | 300 | 0 | 200 | 0 | 100 | 0 | 0 | 0 | 1,000 | 1,000 |
| RICE RESEARCH | 250 | 70 | 972 | 185 | 1,050 | 185 | 1,100 | 188 | 0 | 0 | 0 | 0 | 0 | 0 | 3,372 | 628 | 4,000 |
| RESEARCH SUPPORT PROGRAM | 0 | 4,000 | 0 | 3,500 | 0 | 2,600 | 0 | 1,700 | 0 | 800 | 0 | 0 | 0 | 0 | 0 | 12,600 | 12,600 |
| RESEARCH GRANT PROGRAM | 0 | 0 | 60 | 740 | 2,080 | 2,320 | 2,080 | 2,320 | 630 | 2,320 | 60 | 1,740 | 40 | 1,360 | 4,950 | 10,800 | 15,750 |
| INT'L COLLABORATIVE RESEARCH | 0 | 0 | 950 | 0 | 2,100 | 0 | 3,400 | 0 | 3,750 | 0 | 3,510 | 0 | 2,290 | 0 | 16,000 | 0 | 16,000 |
| **SUB-TOTAL** | 4,835 | 5,489 | 10,896 | 10,400 | 30,127 | 13,140 | 17,516 | 11,372 | 9,503 | 9,354 | 8,400 | 3,844 | 5,197 | 3,220 | 86,474 | 56,819 | 143,293 |
| CONTINGENCIES 5% | 0 | 0 | 545 | 520 | 1,506 | 657 | 876 | 569 | 475 | 468 | 420 | 192 | 260 | 161 | 4,082 | 2,567 | 6,648 |
| INFLATION | 0 | 0 | 545 | 1,144 | 3,088 | 2,303 | 2,761 | 2,382 | 2,048 | 2,720 | 2,321 | 1,455 | 1,767 | 1,524 | 12,530 | 11,529 | 24,059 |
| **TOTAL** | 4,835 | 5,489 | 11,986 | 12,064 | 34,721 | 16,100 | 21,153 | 14,323 | 12,026 | 12,542 | 11,141 | 5,492 | 7,224 | 4,905 | 103,086 | 70,914 | 174,000 |

7/31/88 2 44 PM

**NATIONAL AGRICULTURAL RESEARCH PROJECT**
(263-0152)
AMENDMENT NO. 2

RESEARCH COMPONENT
TECHNICAL ASSISTANCE COST ESTIMATE
($000)

PROJECTION OF EXPENDITURES BY FISCAL YEARS

| SPECIALIZATION | NO. OF MM | COST PER MAN MONTH US$ | COST PER MAN MONTH LC | TOTAL US$ | TOTAL LC | ACTUAL/COMMIT THRU FY88 US$ | ACTUAL/COMMIT THRU FY88 LC | FY89 US$ | FY89 LC | FY90 US$ | FY90 LC | FY91 US$ | FY91 LC | FY92 US$ | FY92 LC | FY93 US$ | FY93 LC | FY94 US$ | FY94 LC | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **LONG TERM** | 980 | | | 13,720 | 2,940 0 | 3,136 | 672 | 1,680 | 360 | 1,848 | 396 | 1,848 | 396 | 1,848 | 396 | 1,680 | 360 | 1,680 | 360 | 16,660 |
| CHIEF OF PARTY (CID) | 95 | 14 | 3 | 1,330 | 285 | 322 | 69 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 1,615 |
| RESEARCH STATION MANAGER (CID) | 95 | 14 | 3 | 1,330 | 285 | 322 | 69 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 1,615 |
| INTERDISCIPLINARY RES. SPT. (CID) | 95 | 14 | 3 | 1,330 | 285 | 322 | 69 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 1,615 |
| ON FARM/DEMONSTRATION SPT. (CID) | 95 | 14 | 3 | 1,330 | 285 | 322 | 69 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 1,615 |
| ADMINISTRATIVE SERVICES ADVISOR(CID | 95 | 14 | 3 | 1,330 | 285 | 322 | 69 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 1,615 |
| LIBRARY/INFORMATION SPT. (CID) | 95 | 14 | 3 | 1,330 | 285 | 322 | 69 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 1,615 |
| RESEARCH STUDIES COORDINATOR (CID) | 95 | 14 | 3 | 1,330 | 285 | 322 | 69 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 1,615 |
| CROP PROTECTION SPT. (CID) | 95 | 14 | 3 | 1,330 | 285 | 322 | 69 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 1,615 |
| AGRICULTURAL MACHINERY SPT. (CID) | 89 | 14 | 3 | 1,246 | 267 | 238 | 51 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 1,513 |
| TRG./MANPOWER DEVELOP. SPT. (CID) | 95 | 14 | 3 | 1,330 | 285 | 322 | 69 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 1,615 |
| AQUACULTURE SPECIALIST (CID) | 36 | 14 | 3 | 504 | 108 | 0 | 0 | 0 | 0 | 168 | 36 | 168 | 36 | 168 | 36 | 0 | 0 | 0 | 0 | 612 |
| **SHORT TERM** | 75 | | | 1,125 | 0 | 90 | 0 | 285 | 0 | 555 | 0 | 180 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 1,125 |
| DESIGN MAINTENANCE PROGRAM (CID) | 8 | 15 | 0 | 120 | 0 | 0 | 0 | 120 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 120 |
| RESEARCH STATION (CID) | 7 | 15 | 0 | 105 | 0 | 0 | 0 | 15 | 0 | 60 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 105 |
| INTERDISCIPLINARY RESEARCH (CID) | 8 | 15 | 0 | 120 | 0 | 0 | 0 | 30 | 0 | 75 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 120 |
| ON FARM/DEMONSTRATION (CID) | 8 | 15 | 0 | 120 | 0 | 0 | 0 | 15 | 0 | 75 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 120 |
| ADMINISTRATIVE SERVICES (CID) | 4 | 15 | 0 | 60 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 60 |
| LIBRARY/INFORMATION (CID) | 5 | 15 | 0 | 75 | 0 | 0 | 0 | 15 | 0 | 60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 75 |
| RESEARCH STUDIES (CID) | 7 | 15 | 0 | 105 | 0 | 0 | 0 | 30 | 0 | 45 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 105 |
| CROP PROTECTION (CID) | 7 | 15 | 0 | 105 | 0 | 0 | 0 | 15 | 0 | 75 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 105 |
| AGRICULTURAL MACHINERY (CID) | 7 | 15 | 0 | 105 | 0 | 0 | 0 | 15 | 0 | 60 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 105 |
| TRG./MANPOWER DEVELOPMENT (CID) | 4 | 15 | 0 | 60 | 0 | 0 | 0 | 15 | 0 | 45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 60 |
| UNSPECIFIED (CID) | 6 | 15 | 0 | 90 | 0 | 45 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 90 |
| TECHNOLOGY TRANSFER SPT. | 4 | 15 | 0 | 60 | 0 | 45 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 60 |
| **TOTAL** | 1,055 | | | 14,845 | 2,940 | 3,226 | 672 | 1,965 | 360 | 2,403 | 396 | 2,028 | 396 | 1,863 | 396 | 1,680 | 360 | 1,680 | 360 | 17,785 |

7/31/88 2:42 PM

**NATIONAL AGRICULTURAL RESEARCH PROJECT**
(263-0152)
AMENDMENT NO. 2

RESEARCH COMPONENT
TRAINING COST ESTIMATE
($000)

PROJECTION OF EXPENDITURES BY FISCAL YEARS

| ILLUSTRATIVE TRAINING PROGRAM | NUMBER OF PARTICIPANTS | TRAINING MONTH(T.M) | COST PER T.M. | | TOTAL | | ACTUAL THRU FY88 | | FY89 | | FY90 | | FY91 | | FY92 | | FY93 | | FY94 | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | |
| **LONG TERM TRAINING** | 297 | 4,974 | | | 11,535 | 576 | 1,089 | 0 | 621 | 0 | 2,295 | 144 | 2,295 | 144 | 2,355 | 144 | 2,295 | 144 | 585 | 0 | 12,111 |
| *DOCTORAL STUDIES* | | | | | | | | | | | | | | | | | | | | | |
| TYPE 1 | 30 | 720 | 0.0 | 0.4 | 0 | 288 | 0 | 0 | 0 | 0 | 0 | 144 | 0 | 144 | 0 | 0 | 0 | 0 | 0 | 0 | 288 |
| | | 720 | 2.5 | 0.0 | 1,800 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 900 | 0 | 900 | 0 | 0 | 0 | 1,800 |
| TYPE 2 | 30 | 720 | 2.5 | 0.0 | 1,800 | 0 | 0 | 0 | 0 | 0 | 900 | 0 | 900 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,800 |
| | | 720 | 0.0 | 0.4 | 0 | 288 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 144 | 0 | 144 | 0 | 0 | 288 |
| TYPE 3 | 16 | 768 | 2.5 | 0.0 | 1,920 | 0 | 0 | 0 | 0 | 0 | 480 | 0 | 480 | 0 | 480 | 0 | 480 | 0 | 0 | 0 | 1,920 |
| *CONTINUATION OF PREVIOUS PROJECT TRAINING* | | | | | 1,635 | 0 | 1,089 | 0 | 546 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,635 |
| *POST DOCTORAL* | | | | | | | | | | | | | | | | | | | | | |
| UNIVERSITIES | 84 | 504 | 2.5 | 0.0 | 1,260 | 0 | 0 | 0 | 45 | 0 | 255 | 0 | 255 | 0 | 270 | 0 | 255 | 0 | 180 | 0 | 1,260 |
| IARC's | 66 | 396 | 2.5 | 0.0 | 990 | 0 | 0 | 0 | 0 | 0 | 210 | 0 | 210 | 0 | 225 | 0 | 210 | 0 | 135 | 0 | 990 |
| PRIVATE INDUSTRY | 71 | 426 | 5.0 | 0.0 | 2,130 | 0 | 0 | 0 | 30 | 0 | 450 | 0 | 450 | 0 | 480 | 0 | 450 | 0 | 270 | 0 | 2,130 |
| **SHORT TERM TRAINING** | 26,510 | 9,290 | | | 3,025 | 6,992 | 0 | 747 | 253 | 1,145 | 605 | 1,100 | 605 | 1,000 | 605 | 1,000 | 605 | 1,000 | 352 | 1,000 | 10,017 |
| *OUT-OF-COUNTRY* | | | | | | | | | | | | | | | | | | | | | |
| TYPE 1 | 90 | 350 | 5.5 | 0.0 | 1,925 | 0 | 0 | 0 | 143 | 0 | 385 | 0 | 385 | 0 | 385 | 0 | 385 | 0 | 242 | 0 | 1,925 |
| TYPE 2 | 200 | 200 | 5.5 | 0.0 | 1,100 | 0 | 0 | 0 | 110 | 0 | 220 | 0 | 220 | 0 | 220 | 0 | 220 | 0 | 110 | 0 | 1,100 |
| *IN-COUNTRY* | 26,220 | 8,740 | 0.0 | 0.8 | 0 | 6,992 | 0 | 747 | 0 | 1,145 | 0 | 1,100 | 0 | 1,000 | 0 | 1,000 | 0 | 1,000 | 0 | 1,000 | 6,992 |
| **TOTAL** | 26,807 | 14,264 | | | 14,560 | 7,568 | 1,089 | 747 | 674 | 1,145 | 2,900 | 1,244 | 2,900 | 1,144 | 2,960 | 1,144 | 2,900 | 1,144 | 937 | 1,000 | 22,128 |

**NATIONAL AGRICULTURAL RESEARCH PROJECT**
(263-0152)
AMENDMENT NO. 2

RESEARCH COMPONENT
COMMODITIES COST ESTIMATE
($000)

PROJECTION OF EXPENDITURES BY FISCAL YEARS

| ILLUSTRATIVE COMMODITIES ITEMS | NUMBER OF UNITS | COST PER UNIT US$ | COST PER UNIT LC | TOTAL US$ | TOTAL LC | ACTUAL THRU FY88 US$ | ACTUAL THRU FY88 LC | FY89 US$ | FY89 LC | FY90 US$ | FY90 LC | FY91 US$ | FY91 LC | FY92 US$ | FY92 LC | FY93 US$ | FY93 LC | FY94 US$ | FY94 LC | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **OFFICE EQUIPMENT / SUPPLIES** | | | | 1,624 | 233 | 0 | 0 | 1,014 | 150 | 360 | 83 | 250 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,857 |
| COMPUTER,SOFTWARE,HARD DISK | | | | | | | | | | | | | | | | | | | | 0 |
| GENERAL | 112 | 5.0 | 0.0 | 560 | 0 | 0 | 0 | 300 | 0 | 260 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 560 |
| RESEARCH MANAGEMENT SYSTEM | 100 | 5.0 | 0.0 | 500 | 0 | 0 | 0 | 250 | 0 | 0 | 0 | 250 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 500 |
| COPIER | 79 | 3.0 | 0.0 | 237 | 0 | 0 | 0 | 137 | 0 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 237 |
| CALCULATORS | 196 | 0.5 | 0.0 | 98 | 0 | 0 | 0 | 98 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 98 |
| FACSIMILE | 36 | 2.5 | 0.0 | 90 | 0 | 0 | 0 | 90 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 90 |
| NETWORK | 67 | 1.0 | 0.0 | 67 | 0 | 0 | 0 | 67 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 67 |
| TYPEWRITERS | 72 | 1.0 | 0.0 | 72 | 0 | 0 | 0 | 72 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 72 |
| OFFICE FURNTURE | 465 | 0.0 | 0.5 | 0 | 233 | 0 | 0 | 0 | 150 | 0 | 83 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 233 |
| **VEHICLES** | | | | 8,166 | 0 | 270 | 0 | 0 | 0 | 7,897 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8,167 |
| TRUCKS (PICKUP) | | | | | | | | | | | | | | | | | | | | |
| GENERAL | 111 | 18.0 | 0.0 | 1,998 | 0 | 0 | 0 | 0 | 0 | 1,998 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,998 |
| ON-FARM TRIALS | 18 | 18.0 | 0.0 | 324 | 0 | 0 | 0 | 0 | 0 | 324 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 324 |
| VANS | 178 | 23.0 | 0.0 | 4,094 | 0 | 270 | 0 | 0 | 0 | 3,824 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4,094 |
| BUS | 22 | 40.0 | 0.0 | 880 | 0 | 0 | 0 | 0 | 0 | 880 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 880 |
| MOTORCYCLES | | | | | | | | | | | | | | | | | | | | |
| GENERAL | 308 | 1.6 | 0.0 | 490 | 0 | 0 | 0 | 0 | 0 | 490 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 490 |
| ON-FARM TRIALS | 238 | 1.6 | 0.0 | 381 | 0 | 0 | 0 | 0 | 0 | 381 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 381 |
| **AQUACULTURE EQUIPMENT AND SUPPLIES** | | | | 388 | 0 | 0 | 0 | 0 | 0 | 80 | 0 | 258 | 0 | 50 | 0 | 0 | 0 | 0 | 0 | 388 |
| **LIBRARY EQUIPMENT** | | | | 2,818 | 682 | 0 | 0 | 1,068 | 682 | 750 | 0 | 250 | 0 | 250 | 0 | 250 | 0 | 250 | 0 | 3,500 |
| **FARM EQUIPMENT** | | | | 3,016 | 236 | 0 | 0 | 1,793 | 236 | 1,223 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3,252 |
| GENERAL | | | | 2,723 | 236 | 0 | 0 | 1,500 | 236 | 1,223 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2,959 |
| ON-FARM TRIALS | | | | 293 | 0 | 0 | 0 | 293 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 293 |
| **LAB EQUIPMENT AND SUPPLIES** | | | | 12,834 | 0 | 0 | 0 | 1,700 | 0 | 6,884 | 0 | 4,250 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12,834 |
| GENERAL | | | | 12,548 | 0 | 0 | 0 | 1,700 | 0 | 6,598 | 0 | 4,250 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12,548 |
| ON-FARM TRIALS | | | | 286 | 0 | 0 | 0 | 0 | 0 | 286 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 286 |
| **TOTAL** | | | | 28,846 | 1,151 | 270 | 0 | 5,575 | 1,068 | 17,194 | 83 | 5,008 | 0 | 300 | 0 | 250 | 0 | 250 | 0 | 29,998 |

7/31/88 2:37 PM

**NATIONAL AGRICULTURAL RESEARCH PROJECT**
(263-0152)
AMENDMENT NO. 2

RESEARCH COMPONENT
SERVICES COST ESTIMATE
($000)

PROJECTION OF EXPENDITURES BY FISCAL YEARS

| ITEMS | ACTUAL THRU FY88 | | FY89 | | FY90 | | FY91 | | FY92 | | FY93 | | FY94 | | TOTAL | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | |
| **MAINTENANCE** | 0 | 0 | 500 | 700 | 1,400 | 900 | 1,000 | 500 | 0 | 500 | 0 | 500 | 0 | 500 | 2,900 | 3,600 | 6,500 |
| CONTRACTUAL SERVICES | 0 | 0 | 0 | 500 | 0 | 500 | 0 | 500 | 0 | 500 | 0 | 500 | 0 | 500 | 0 | 3,000 | 3,000 |
| EQUIPMENT & SPARE PARTS | | 0 | 500 | 0 | 1,400 | 0 | 1,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2,900 | 0 | 2,900 |
| WORKSHOP RENOVATION | 0 | 0 | 0 | 200 | 0 | 400 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 600 | 600 |
| **RENOVATION** | 0 | 0 | 0 | 500 | 0 | 3,210 | 0 | 2,822 | 0 | 3,000 | 0 | 0 | 0 | 0 | 0 | 9,532 | 9,532 |
| LABORATORIES | 0 | 0 | 0 | 0 | 0 | 900 | 0 | 742 | 0 | 1,000 | 0 | 0 | 0 | 0 | 0 | 2,642 | 2,642 |
| NAT'L RESEARCH LIBRARY | 0 | 0 | 0 | 500 | 0 | 636 | 0 | 500 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,636 | 1,636 |
| ON-FARM TRIALS | 0 | 0 | 0 | 0 | 0 | 74 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 74 | 74 |
| RESEARCH STATIONS | 0 | 0 | 0 | 0 | 0 | 1,600 | 0 | 1,580 | 0 | 2,000 | 0 | 0 | 0 | 0 | 0 | 5,180 | 5,180 |
| **RESEARCH STATION IMPROVEMENTS** | 0 | 0 | 0 | 2,002 | 1,000 | 2,002 | 0 | 2,002 | 0 | 994 | 0 | 0 | 0 | 0 | 1,000 | 7,000 | 8,000 |
| DRAINAGE | 0 | 0 | 0 | 200 | 0 | 200 | 0 | 200 | 0 | 100 | 0 | 0 | 0 | 0 | 0 | 700 | 700 |
| PUMP STATIONS | 0 | 0 | 0 | 0 | 1,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,000 | 0 | 1,000 |
| PIPE INSTALLATION | 0 | 0 | 0 | 1,500 | 0 | 1,500 | 0 | 1,500 | 0 | 750 | 0 | 0 | 0 | 0 | 0 | 5,250 | 5,250 |
| LOCAL COMMODITIES | 0 | 0 | 0 | 230 | 0 | 230 | 0 | 230 | 0 | 110 | 0 | 0 | 0 | 0 | 0 | 800 | 800 |
| LEVELING, SUBSOILING, AND GYPSUM | 0 | 0 | 0 | 72 | 0 | 72 | 0 | 72 | 0 | 34 | 0 | 0 | 0 | 0 | 0 | 250 | 250 |
| **COMMUNICATIONS** | 0 | 0 | 0 | 200 | 0 | 200 | 0 | 300 | 0 | 200 | 0 | 100 | 0 | 0 | 0 | 1,000 | 1,000 |
| **RICE RESEARCH (IRRI)** | 250 | 70 | 972 | 185 | 1,050 | 185 | 1,100 | 188 | 0 | 0 | 0 | 0 | 0 | 0 | 3,372 | 628 | 4,000 |
| T.A. | 250 | 70 | 800 | 185 | 800 | 185 | 800 | 188 | 0 | 0 | 0 | 0 | 0 | 0 | 2,650 | 628 | 3,278 |
| TRAINING | 0 | 0 | 172 | 0 | 250 | 0 | 300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 722 | 0 | 722 |
| **RESEARCH SUPPORT PROGRAM** | 0 | 4,000 | 0 | 3,500 | 0 | 2,600 | 0 | 1,700 | 0 | 800 | 0 | 0 | 0 | 0 | 0 | 12,600 | 12,600 |
| **RESEARCH GRANT PROGRAM** | 0 | 0 | 60 | 740 | 2,080 | 2,320 | 2,080 | 2,320 | 630 | 2,320 | 60 | 1,740 | 40 | 1,360 | 4,950 | 10,800 | 15,750 |
| EGYPTIAN PUBLIC INSTITUTIONS | 0 | 0 | 0 | 500 | 2,000 | 2,000 | 2,000 | 2,000 | 550 | 2,000 | 0 | 1,500 | 0 | 1,200 | 4,550 | 9,200 | 13,750 |
| EGYPTIAN PRIVATE INSTITUTIONS | 0 | 0 | 60 | 240 | 80 | 320 | 80 | 320 | 80 | 320 | 60 | 240 | 40 | 160 | 400 | 1,600 | 2,000 |
| **INT'L COLLABORATIVE RESEARCH** | 0 | 0 | 950 | 0 | 2,100 | 0 | 3,400 | 0 | 3,750 | 0 | 3,510 | 0 | 2,290 | 0 | 16,000 | 0 | 16,000 |
| U.S. UNIVERSITIES | 0 | 0 | 200 | 0 | 500 | 0 | 1,000 | 0 | 1,300 | 0 | 1,200 | 0 | 800 | 0 | 5,000 | 0 | 5,000 |
| IARC's | 0 | 0 | 0 | 0 | 600 | 0 | 1,400 | 0 | 1,700 | 0 | 1,560 | 0 | 740 | 0 | 6,000 | 0 | 6,000 |
| USDA | | | 750 | | 1,000 | | 1,000 | | 750 | | 750 | | 750 | | 5,000 | 0 | 5,000 |

7/31/88 2 39 PM

**NATIONAL AGRICULTURAL RESEARCH PROJECT**
(263-0152)
AMENDMENT NO. 2

RESEARCH COMPONENT
SERVICES COST ESTIMATE
($000)

PROJECTION OF EXPENDITURES BY FISCAL YEARS

| ITEMS | ACTUAL THRU FY88 | | FY89 | | FY90 | | FY91 | | FY92 | | FY93 | | FY94 | | TOTAL | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | |
| **OFFSHORE TRAINING-CONTRACTOR** | 0 | 0 | 0 | 0 | 318 | 166 | 218 | 166 | 218 | 166 | 218 | 166 | 218 | 166 | 1,190 | 830 | 2,020 |
| T.A. | 0 | 0 | 0 | 0 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 840 | 180 | 1,020 |
| SUPPORT | 0 | 0 | 0 | 0 | 150 | 130 | 50 | 130 | 50 | 130 | 50 | 130 | 50 | 130 | 350 | 650 | 1,000 |
| **TOTAL** | 250 | 4,070 | 2,482 | 7,827 | 7,630 | 11,417 | 7,580 | 9,832 | 4,380 | 7,814 | 3,570 | 2,340 | 2,330 | 1,860 | 28,222 | 45,160 | 73,382 |

COST ASSUMPTIONS

1. DRAINAGE COSTS ARE ESTIMATED AT (3500 FEDDANS @ $200)
2. PUMP STATIONS COSTS AR ESTIMATED AT (20 PUMPS @ $50000)
3. PIPE INSTALLATION COSTS ARE ESTIMATED AT (3500 FED @ $1500)
4. LOCAL COMMODITIES ARE ESTIMATED AT (3500 FED @ $230)
5. IRRI COSTS INCLUDE T.A.(LT 138MM, ST 48MM, & LOCAL 336MM)
6. U.S. UNIVERSITIES COSTS ARE ESTIMATED AT (10 AGREEMENTS @ $0.5M)
7. IARC COST ARE ESTIMATED AT (11 AGREEMENTS @ $0.5M + 10% ADMIN FEE)
8. OFFSHORE TRAINING-CONTRACTOR IS NON ADD BUDGET ITEM, ADMIN. COST ALREADY CALCULATED IN THE TRAINING COEFFICIENT.

AGENCY FOR INTERNATIONAL DEVELOPMENT

Washington, D. C. 20523

# PROJECT PAPER
# AMENDMENT #2
# ANNEXES A THRU J

EGYPT: National Agricultural Research (263-0152)

August 22, 1988

ANNEX A

# CONCEPT PAPER
# NATIONAL AGRICULTURAL RESEARCH PROJECT (263-0152)

## PURPOSE

The purpose of this concept paper is to broaden the focus of the National Agricultural Research Project (NARP) to include policy formulation and extension elements. The amended Project will have three major components (Agricultural Research, Extension and Policy Analysis and Formulation). The Project will be renamed National Agricultural Support Project.

## BACKGROUND

Agriculture is the largest sector in the Egyptian economy, accounting for about 20 percent of GDP (largest contribution after oil) and about 40 percent of total employment. In contrast to strong performance in the 1960s, agricultural growth declined to about two percent per annum during the mid and late 1970s and has shown a consistently poor performance for the past 10 years.

## GROWTH POTENTIAL

Egypt has extremely favorable conditions for agricultural production. Compared with most other LDCs, Egypt's present production levels are high. Nevertheless, despite the existing ideal agricultural production conditions, Egypt has considerable latitude for improvement. With the improved technological base now being established, coupled with appropriate incentive policies, the potential for increasing the productivity of the agricultural sector ranges from 25 percent to 100 percent, depending upon the particular crop and location. Agriculture production is not keeping pace with population growth; more efficient use of Egypt's arable land, approximately three percent of total surface area, must be increased significantly.

## RELATIONSHIP TO POLICY

Through the Agricultural Production Credit Project (APC, 263-0202) policy reform begun under previous AID funded projects, will be continued. Specific policies constraining agricultural productivity have been identified as:

- forced government determined crop acreage,
- forced government procurement of farm output at below market prices,
- public sector monopoly of input distribution and marketing,
- restrictions on crop marketing, inputs and exports, and
- multiple exchange rates.

Under the APC, the MOA and AID have agreed upon a set of reforms which provide for greater deregulation of the agricultural sector. However, the APC does not include funds for supporting a policy analysis unit or other institutional reforms. The NASP proposes to fill this gap.

**RELATIONSHIP TO CDSS**

The 1987 CDSS states that, assuming that an improved policy environment leads toward increases in agricultural production, reduction of food imports and conservation of foreign exchange expenditures, it would be appropriate for USAID to increase its assistance to the agricultural sector. The CDSS endorses the recommendation that the National Agricultural Research Project (NARP, 263-0152) be amended to include support of MOA administrative reforms, policy analysis and formulation, agricultural extension, and establishment of a private sector coordinating office within the MOA.

**NARP BACKGROUND**

Since the NARP Project Paper was authorized in late FY 85, the Ministry of Agriculture has undertaken many positive changes. Many of these are policy reforms impacting extensively on production. Mandatory procurements are now limited to sugar, cotton and a portion of the rice crop. Farm prices for these GOE procured crops have been raised.

The Ministry of Agriculture has altered its administrative responsibilities to provide a more cohesive management style reflecting a broader sector approach. The MOA has requested AID project support to address the total agricultural sector.

As the GOE and AID move development assistance from a multi-projects mode to a sector approach, it is desirable to incorporate lessons learned from terminating projects. The AGR/A office is now completing seven projects which provide guidance and direction for future activities in the agricultural sector. For example:

- methods for supporting collaborative research between Egyptian faculties of Agriculture and the MOA,
- means of enhancing data collection capacities,
- methods of in-service training, and
- models for technical information dissemination.

In addition to the staff trained, buildings completed, labs furnished and commodities installed under these projects, the MOA has reached a new management maturity with strengthened capacity to implement AID assisted projects.

PROPOSED PROJECT DESCRIPTION
Based on comprehensive discussions with the MOA, we propose to amend the NARP. This new Project Paper would be a self-contained document superseding the original Project Paper. The Project Paper Amendment will perform two major functions:

1. clarify and strengthen the narrative describing those research components already authorized in the original PP, and realign the budget accordingly. This component will also provide support to "first generation" agricultural projects, and
2. add several new elements, namely:
   a. support for the extension function (technology transfer) and improve linkages with research activities, and
   b. support an invigorated MOA policy analysis unit.

PROJECT ELEMENTS
RESEARCH
The purpose of this element is develop agricultural research capacity capable of continuously generating and demonstrating site specific improved technologies. The MOA is currently undertaking major efforts to formulate annual research plans, training plans and personnel inventories, needs assessments based on the MOA's Five Year Plan and a number of other comprehensive planning documents. These documents will provide detailed information for the amended PP narrative.

The Consortium for International Development (CID) was awarded the technical assistance contract and will have eleven long term staff members in place by June. Reflecting the new, broadened focus, the TA team has already begun assisting the MOA develop both long and short term research goals, commodity procurement plans, and a training plan. The development of these plans has underlined the desirability to amend the original NARP Project Paper to include support for technology transfer component.

As the AGR Directorate shifts from a portfolio of commodity specific projects into broader MOA focus, it is becoming increasingly apparent that some worthy activities begun under the "first generation" projects need additional support under the new "second generation" project. Horticultural research and collaborative research through CRSPs or similar type arrangements fall into this category. The PP will take a realistic look at the recurrent costs of the MOA in general and those activities AID has begun in specific.

445

It is envisioned that AID will encourage other donors in support to operationalize fisheries facilities. Additional work to be performed under collaborative arrangements may require short-term TA.

Training and a limited amount of commodities as well as support for the continuation of on-going activities make up the bulk of this component's budget. No new construction will be undertaken, but refurbishing may be needed at some sites.

**TECHNOLOGY TRANSFER ELEMENT**

During the design phase of this Project an outside team of three specialists will perform an analysis of extension as a function, not as an organization. The analysis will start from the problem, how to reach farmers with the information they need to increase their incomes/productivity and how to make their needs known to the research system. Moreover, the analysis will look carefully at different approaches to address specific information needs and the dissemination of such information. Priority will be given to non-traditional means of increasing Egyptian farmer's access to agricultural information.

USAID will support a system which is driven by farmer demands for more relevant information. In the past 10 years, the AGR Directorate has initiated a number of agricultural research projects, each containing its own extension/information dissemination system. Thus, various technology transfer models have been tried and tested by USAID in Egypt. Drawing from AID's experience in this sector and using successful components from several models, a national system for agricultural research dissemination will be added to the NARP. An effective extension program is expected to use different approaches to address specific information needs; they could include mass media, PVO's and the private sector.

Institutional linkages formulated through the National Extension Advisory Council are established with the Ministry of Irrigation (Water Usage Groups), the Principal Bank for Development and Agricultural Credit, and government owned mechanization units.

This element may require long term TA. Commodity support for extension will be determined after the extension function is analyzed. Training will be predominantly in-country (SMSs, VEWs, Extension staff). No new construction will be undertaken. If refurbishing and rehabilitation of extension f ilities is required, u of the Special Account will be considered.

-446-

**POLICY ANALYSIS AND FORMULATION ELEMENT**
The MOA has recently instituted the Official Agricultural System for Information Services (OASIS) under the direct control of the Undersecretary for Agricultural Economics. This office builds on activities begun under the Agricultural Development Systems (263-0041) and the Data Collection and Analysis (263-0142) Projects. Limited regionally gathered data exists. This data collection capacity needs expanding into a national collection using a probability sample frame and objective yields. Analysis and policy formulation capacities need developing. In the course of the project, flexible systems for planning, monitoring and assessing agricultural policy will also be introduced. The objective of this project element will be to strengthen the capacity of OASIS to select, design, monitor and evaluate agricultural policy to support the GOE's desire to deregulate agriculture through market liberalization. It will also provide guidance on how AID can support the MOA's private sector office.

Moreover, this element will include a major studies component. It will consist of a series of GOE/USAID approved studies, why they are considered important and a cost estimate for each.

Long term technical assistance (Senior Policy Analyst, Agricultural Economist, Statistics Advisor and Computer Specialist), extensive on-the-job training, long-term training and some commodities are the principal ingredients of this component.

**END OF PROJECT STATUS**
The research component purpose is to develop a fully functioning research network with capability to provide a continuous flow of improved, appropriate agricultural technology. This component's End of Project Status will be verified by increased yields of demonstration plots of at least 25 percent and annual increases of the target commodities of at least 2 percent 3 years after releasing the improved technologies.

The purpose of the policy analysis and formulation component is to establish a system of providing accurate data and analysis to decision-makers for policy and planning. This will be achieved through improved linkages and coordination between policy analysts and decision-makers, increased computer capacity and an improved national agricultural data collection and analysis system.

The technology transfer component purpose is to disseminate agricultural research results to Egyptian farmers. Means to accomplish this will be determined by the proposed extension function study through greater coordination between the ARC and the NES, a functional mass media facility and a regular, organized, interdisciplinary extension system.

PROJECT GOAL
Attain self-sufficiency in basic food commodities, primarily through increasing the production and income of small Egyptian farmers.

**DRAFTED:AGR/A:THARDT:IIZ:AMENDNO2**

UNITED STATES AGENCY for INTERNATIONAL DEVELOPMENT

CAIRO, EGYPT

April 6, 1987

TO : Distribution

FROM : Vivikka Molldrem, PPP/PL

SUBJECT : National Agriculture Support Project (NASP)
Concept Paper for PP Amendment:
Decisions from Executive Committee Review

The meeting, held April 1, led to the following guidance for redrafting the Concept Paper and preparing the PP Amendment:

1. Extension: In designing this component, it is important to view extension as a function, not as an organization. Start from the problem: how to reach farmers with the information they need to increase production in the crops they choose, and how to make their needs known to the research system.

It may be necessary to use different approaches to address specific information needs. Effective extension could include a role for the mass media, for PVOs, for private seed companies, for successful extension models developed through our agricultural research projects and SFPP, or for the governorates.

In discussions with the MOA, we should be careful to present extension as a function, so that the assumption is not made that the objective is to strengthen the National Extension Service in a classical extension project. Similarly, we should be careful how the design T.A. is structured. If we call in "extension" specialists, they are likely to focus on extension as an organization.

In designing this component, we need to examine how the farmers get information now. Then we need to look at successful extension models, such as the SFPP, to determine what models do and do not work, and why. We should review the importance of subject matter specialists. We should consider the S&T buy-ins that explore innovative approaches to extension and private sector extension linkages as a possible source of assistance both in design and implementation.

In designing the extension component, we need to take care that

- o we do not reinforce the regulatory functions of the MOA extension service;
- o extension provides two-way information (farmer feedback loop); and
- o extension includes information on water management.

2. Policy Analysis Component: As the Concept Paper describes it, the role of the policy analysis unit will be different from the traditional role of the MOA, that is, control of agricultural production. The component will develop a policy analysis and formulation capacity within the MOA, including provision of information and analysis needed to decontrol agriculture. Like the extension component, this should be designed very carefully to avoid strengthening the regulatory capability of the MOA.

The unit should provide the permanent capability to monitor agricultural activity in the country, including progress on policy performance.

The view raised by S&T Bureau reps at the AID/W review of the concept paper was seconded here: the project should not attempt to place too many diverse activities on the policy analysis unit. It is more likely to perform its primary function effectively if it does not have competing auxiliary functions.

3. Major Studies: The major studies portion of the Policy Analysis component must list in the PP Amendment the studies which are proposed, and why they are considered important.

4. Aquaculture: Rather than continuing USAID's role as the primary donor in aquaculture, AGR should make vigorous efforts to obtain other donor support to make aquaculture a multi-donor activity. USAID should disengage as quickly as possible.

5. Private Sector Coordination Office of the MOA: IS questioned the utility of this activity, since other government "private sector coordination" offices have acted as control agents rather than facilitators. However, the activity was not disapproved.

6. AID/W Consultation: Since there are no major policy issues associated with this amendment, and since the Concept Paper has been reviewed by AID/W, no further consultation with AID/W is required prior to approval of the PP Amendment.

7. Design requirements: There are no objections to a two-person design team as recommended by AGR, although the proposed SOWs will need some revisions based on this meeting. It should be clear that though design team members will provide certain project analyses, AGR/A staff will draft the Amendment itself.

It is possible that the $45,000 already approved under NARP for the design team may not be enough. Though obtaining MOA approval for further design funding may be difficult, AGR should make every effort to use this resource.

8. Construction: Since refurbishing facilities may not be required for the extension component, this discussion has been deferred. If further design indicates that some funding for construction is needed, use of the special account should be considered.

9. Long-term T.A. for the Policy Analysis Unit: Except for the one PASA (computer specialist) with USAID which has already been approved, the Executive Committee preference is that further long-term T.A. should be competed, rather than using USDA PASAs. There is a USDH ceiling concern with PASAs.

10. Recurrent Costs: An increase in project funding is likely to mean an increase in recurrent cost financing by USAID. Two possible solutions were offered for AGR's consideration:

- increased use of the special account, and
- performance payments against adequate financing for research in the GOE budget.

11. Timing: The proposed approach to extension requires much thought and should not be designed hastily. The timetable proposed in the Concept Paper is probably too optimistic. In a subsequent meeting, however, the Director expressed his desire to shoot for an FY 87 obligation.

12. Next Steps: AGR will rewrite the Concept Paper to reflect discussions of this meeting, and provide a new timetable for project design. No additional meeting is planned to review the revised Concept Paper, but there will be a separate review of the extension component once AGR has done preliminary design work on how this activity should be implemented.

Clearance:

W Janssen (draft)
G Laudato

DISTRIBUTION:

FB KIMBALL, DIR
A HANDLY, DD
G LAUDATO, AD/PPP
K O'DONNELL, AD/LEG
W MILLER, AD/FM
B WILDER, AD/HRDC
F ZOBRIST, AD/DR
W JANSSEN, AD/AGR
R VAN RAALTE, AD/IS
P O'FARRELL, DAD/IS
P GAJEWSKI, PPP/E
D DU LAVEY, PPP/P
J FOTI, AGR/A
T HARDT, AGR/A
C LAWHEAD, AGR/A
V DUARTE, PPP/E
T CLARKSON, FM
M WILLIAMS, LEG
F MILLER, DR/PS

UNITED STATES AGENCY for INTERNATIONAL DEVELOPMENT

CAIRO, EGYPT

October 8, 1987

MEMORANDUM:

TO: Marshall D. Brown, Director

THRU: George Laudato, Deputy Director

FROM: John A. Foti, AD/AGR(A)

SUBJECT: Confirmation of NARP Redesign Guidance

During your meeting with Bill Janssen on Thursday, September 24th at 8:00 p.m. you discussed the following four issues:

1. PBDAC Proposal for Expansion into Six Governorates.

2. RFP for the APC Project.

3. 2nd Tranche in APC.

4. NARP Amendment Redesign.

The purpose of this memo is to confirm the guidance provided on the NARP Amendment redesign which follows:

1. Proceed with an Amendment No. 2

2. Amendment No. 2 will be revised PP with three components: research, extension, and economics and policy analysis.

3. The extension component will be a two-prong program:

   a. central level support for general extension activities (the wholesale approach)1/, and

   b. a governorate extension activity, which will support local level planning and execution of technology transfer (the retail approach). Funds will be provided based on the governorate plans in a manner similar to the LD II model.

1/Public extension services, mass media, private sector, and PVO's perform wholesale linkage functions. That links the research community with a wide variety of intermediary groups operating at the field level (retail) and in contact with farmers.

4. No name change. The Project will continue to be called NARP. The Project purpose statement can be broaden to accommodate the two new components.

5. The revised PP text will be 50 pages or less and will be as direct and simple as possible. It will also have an executive summary of no ~~more than~~ approximately 5 pages.

6. Background discussion in the PP should focus on why we are amending NARP. The revised PP will completely replace the original PP. Mention of history prior to NARP approval will not be necessary.

7. Aquaculture support will not be a sub-project or a separate activity; any support to the Aquaculture Center will be folded into the overall research component of NARP. No more than a paragraph should be devoted to this subject in the PP text. Inputs of TA, training, commodities, and operating expenses will be limited and handled as other inputs in the project.

8. No separate seed component; it will be folded into the research component, and will include necessary additional funding for an expanded seed effort. (An Annex will be used to articulate the expanded activity.)

9. Some "new initiatives" funding will be budgeted to be utilized for investigation or design, feasibility analyses, specialize TA or training not covered by the project components. These funds will be as easily accessed from the AID side as from the GOE side.

? 10. ~~Per~~ conditional? formance payment mechanism can and should be explored as a means to enhance development and improve the flow of local currency to the MOA.

11. There will not be a 3rd amendment moving toward a sector program. NARP will be implemented and completed as redesigned. Other potential new components will be handled through different mechanisms.

12. The Agricultural Directorate needs to start thinking about new ways to support agricultural development. An agricultural CIP program to support agricultural initiatives was discussed. We should be thinking about ways to use the local currency generated by such a program.

Concur: Sy
Marshall D. Brown

Date: 10/13/89

454

ANNEX B

# GOE REQUEST FOR ASSISTANCE

National Agricultural Research Project
(No. 263-0152)
Project Paper Amendment No. 2

## STATUTORY CHECKLIST

### PROJECT CHECKLIST

A. GENERAL CRITERIA FOR PROJECT

| | |
|---|---|
| 1. FY 1988 Continuing Resolution Sec. 523; FAA Sec. 634A. If money is sought to be obligated for an activity not previously justified to Congress, or for an amount in excess of an amount previously justified to Congress, has Congress been properly notified? | Congressional Notifications will be submitted in accordance with regular agency practice. |
| 2. FAA Sec. 611(a)(1). Prior to obligation in excess of $500,000, will there be (a) engineering, financial or other plans necessary to carry out the assistance, and (b) a reasonably firm estimate of the cost to the U.S. of the assistance? | (a) Yes<br>(b) Yes |
| 3. FAA Sec. 611(a)(2). If legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance? | The People's Assembly is expected to ratify the grant agreement amendment in a timely fashion. It has ratified prior grant agreements. |

| | | |
|---|---|---|
| 4. | FAA Sec. 611(b); FY 1988 Continuing Resolution Sec. 501. If project is for water or water-related land resource construction, have benefits and costs been computed to the extent practicable in accordance with the principles, standards, and procedures established pursuant to the Water Resources Planning Act (42 U.S.C. 1962, et seq.)? (See A.I.D. Handbook 3 for guidelines.) | N/A |
| 5. | FAA Sec. 611(e). If project is capital assistance (e.g., construction), and total U.S. assistance for it will exceed $1 million, has the Mission Director certified and the Regional Assistant Administrator taken into consideration the country's capability to maintain and utilize the project effectively? | N/A |
| 6. | FAA Sec. 209. Is project susceptible to execution as part of regional or multilateral project? If so, why is project not so executed? Information and conclusion whether assistance will encourage regional development programs. | No |
| 7. | FAA Sec. 601(a). Information and conclusions on whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions. | The Project will encourage international agricultural research and the Egyptian private agricultural sector and will improve the capability of the Egyptian public and private sectors to conduct agricultural research. |

-457

| | |
|---|---|
| 8. FAA Sec. 601(b). Information and conclusions on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise). | Most goods and services for the Project will be procured from private U.S. sources. |
| 9. FAA Secs. 612(b), 636(h). Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized in lieu of dollars. | The Grant Agreement Amendment will specify the financial obligations of the host country, both in-kind and in-cash. Egypt is not an excess currency country; therefore U.S. dollars may be needed to purchase local currency. |
| 10. FAA Sec. 612(d). Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release? | No |
| 11. FY 1988 Continuing Resolution Sec. 521. If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar or competing commodity? | No agricultural commodity whose production may be expanded as a result of this Project is likely to be in surplus on world markets if and when production increases; nor is the Project likely to cause substantial injury to U.S. producers. |
| 12. FY 1988 Continuing Resolution Sec. 553. Will the assistance (except for programs in Caribbean Basin Initiative countries under U.S. Tariff Schedule "Section 807," which allows reduced tariffs on articles assembled abroad from U.S.-made components) be used directly to procure feasibility studies, prefeasibility studies, or project profiles of potential investment in, or to assist the establishment of facilities specifically designed for, the | No |

-458

manufacture for export to the United States or to third country markets in direct competition with U.S. exports, of textiles, apparel, footwear, handbags, flat goods (such as wallets or coin purses worn on the person), work gloves or leather wearing apparel?

| | |
|---|---|
| 13. FAA Sec. 119(g)(4)-(6). Will the assistance (a) support training and education efforts which improve the capacity of recipient countries to prevent loss of biological diversity; (b) be provided under a long-term agreement in which the recipient country agrees to protect ecosystems or other wildlife habitats; (c) support efforts to identify and survey ecosystems in recipient countries worthy of protection; or (d) by any direct or indirect means significantly degrade national parks or similar protected areas or introduce exotic plants or animals into such areas? | (a) No<br>(b) No<br>(c) No<br>(d) No |
| 14. FAA 121(d). If a Sahel project, has a determination been made that the host government has an adequate system for accounting for and controlling receipt and expenditure of project funds (either dollars or local currency generated therefrom)? | N/A |
| 15. FY 1988 Continuing Resolution. If assistance is to be made to a United States PVO (other than a cooperative development organization), does it obtain at least 20 percent of its total annual funding for international activities from sources other than the United States Government? | No assistance will be provided to a U.S. PVO under this Project. |
| 16. FY 1988 Continuing Resolution Sec. 541. If assistance is being made available to a PVO, has that organization provided upon timely request any document, file, or record necessary to the auditing requirements of A.I.D., and is the PVO registered with A.I.D.? | No assistance will be provided to a PVO under this Project. |

.454

| | |
|---|---|
| 17. FY 1988 Continuing Resolution Sec. 514. If funds are being obligated under an appropriation account to which they were not appropriated, has prior approval of the Appropriations Committees of Congress been obtained? | N/A |
| 18. FY 1988 Continuing Resolution Sec. 515. If deob/reob authority is sought to be exercised in the provision of assistance, are the funds being obligated for the same general purpose, and for countries within the same general region as originally obligated, and have the Appropriations Committees of both Houses of Congress been properly notified? | N/A |
| 19. State Authorization Sec. 139 (as interpreted by conference report). Has confirmation of the date of signing of the project agreement, including the amount involved, been cabled to State L/T and A.I.D. LEG within 60 days of the agreement's entry into force with respect to the United States, and has the full text of the same agreement been pouched to those same offices? (See Handbook 3, Appendix 6G for agreements covered by this provision). | Upon signing of the Grant Agreement Amendment, the date of such signing will be cabled and the full text will be sent by pouch. |

B. FUNDING CRITERIA FOR PROJECT

1. Economic Support Fund Project Criteria

| | |
|---|---|
| a. FAA Sec. 531(a). Will this assistance promote economic and political stability? To the maximum extent feasible, is this assistance consistent with the policy directions, purposes, and programs of Part I of the FAA? | Yes<br>Yes |
| b. FAA Sec. 531(e). Will this assistance be used for military or paramilitary purposes? | No |
| c. FAA Sec. 609. If commodities are to be granted so that sale proceeds will accrue to the recipient country, have Special Account (counterpart) arrangements been made? | N/A |

460

STANDARD ITEM CHECKLIST

A. PROCUREMENT

| | |
|---|---|
| 1. FAA Sec. 602(a). Are there arrangements to permit U.S. small business to participate equitably in the furnishing of commodities and services financed? | Yes; solicitation notices will be published in accordance with standard Agency procedures. |
| 2. FAA Sec. 604(a). Will all procurement be from the U.S. except as otherwise determined by the President or under delegation from him? | Yes |
| 3. FAA Sec. 604(d). If the cooperating country discriminates against marine insurance companies authorized to do business in the U.S., will commodities be insured in the United States against marine risk with such a company? | Yes |
| 4. FAA Sec. 604(e); ISDCA of 1980 Sec. 705(a). If non-U.S. procurement of agricultural commodity or product thereof is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity? (Exception where commodity financed could not reasonably be procured in U.S.) | N/A |

| | | |
|---|---|---|
| 5. | FAA Sec. 604(g). Will construction or engineering services be procured from firms of advanced developing countries which are otherwise eligible under Code 941 and which have attained a competitive capability in international markets in one of these areas? (Exception for those countries which receive direct economic assistance under the FAA and permit United States firms to compete for construction or engineering services financed from assistance programs of these countries.) | No |
| 6. | FAA Sec. 603. Is the shipping excluded from compliance with the requirement in section 901(b) of the Merchant Marine Act of 1936, as amended, that at least 50 percent of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed shall be transported on privately owned U.S. flag commercial vessels to the extent such vessels are available at fair and reasonable rates? | No |
| 7. | FAA Sec. 621(a). If technical assistance is financed, will such assistance be furnished by private enterprise on a contract basis to the fullest extent practicable? | Yes |
| | Will the facilities and resources of other Federal agencies be utilized, when they are particularly suitable, not competitive with private enterprise, and made available without undue interference with domestic programs? | Yes |
| 8. | International Air Transportation Fair Competitive Practices Act, 1974. If air transportation of persons or property is financed on grant basis, will U.S. carriers be used to the extent such service is available? | Yes |

-462

9. FY 1988 Continuing Resolution Sec. 504. If the U.S. Government is a party to a contract for procurement, does the contract contain a provision authorizing termination of such contract for the convenience of the United States? — Yes

10. FY 1988 Continuing Resolution Sec. 524. If assistance is for a consulting service through a procurement contract pursuant to 5 U.S.C. 3109, are contract expenditures a matter of public record and available for public inspection (unless otherwise provided by law or Executive order)? — Yes

B. CONSTRUCTION

1. FAA Sec. 601(d). If capital (e.g., construction) project, will U.S. engineering and professional services be used? — N/A

2. FAA Sec. 611(c). If contracts for construction are to be financed, will they be let on a competitive basis to maximum extent practicable? — N/A

3. FAA Sec. 620(k). If for construction of productive enterprise, will aggregate value of assistance to be furnished by the U.S. not exceed $100 million (except for productive enterprises in Egypt that were described in the CP), or does assistance have the express approval of Congress? — N/A

C. OTHER RESTRICTIONS

1. FAA Sec. 122(b). If development loan repayable in dollars, is interest rate at least 2 percent per annum during a grace period which is not to exceed ten years, and at least 3 percent per annum thereafter? — N/A

2. FAA Sec. 301(d). If fund is established solely by U.S. contributions and administered by an international organization, does Comptroller General have audit rights? N/A

3. FAA Sec. 620(h). Do arrangements exist to ensure that United States foreign aid is not used in a manner which, contrary to the best interests of the United States, promotes or assists the foreign aid projects or activities of the Communist-bloc countries? Yes

4. Will arrangements preclude use of financing:

a. FAA Sec. 104(f); FY 1988 Continuing Resolution Secs. 525, 538. (1) To pay for performance of abortions as a method of family planning or to motivate or coerce persons to practice abortions; (2) to pay for performance of involuntary sterilization as method of family planning, or to coerce or provide financial incentive to any person to undergo sterilization; (3) to pay for any biomedical research which relates, in whole or part, to methods or the performance of abortions or involuntary sterilizations as a means of family planning; or (4) to lobby for abortion? Yes Yes Yes Yes

b. FAA Sec. 483. To make reimbursements, in the form of cash payments, to persons whose illicit drug crops are eradicated? Yes

c. FAA Sec. 620(g). To compensate owners for expropriated or nationalized property, except to compensate foreign nationals in accordance with a land reform program certified by the President? Yes

d. FAA Sec. 660. To provide training, advice, or any financial support for police, prisons, or other law enforcement forces, except for narcotics programs? Yes

464

| | |
|---|---|
| e. FAA Sec. 662. For CIA activities? | Yes |
| f. FAA Sec. 636(i). For purchase, sale, long-term lease, exchange or guaranty of the sale of motor vehicles manufactured outside U.S., unless a waiver is obtained? | Yes |
| g. FY 1988 Continuing Resolution Sec. 503. To pay pensions, annuities, retirement pay, or adjusted service compensation for military personnel? | Yes |
| h. FY 1988 Continuing Resolution Sec. 505. To pay U.N. assessments, arrearages or dues? | Yes |
| i. FY 1988 Continuing Resolution Sec. 506. To carry out provisions of FAA section 209(d) (transfer of FAA funds to multilateral organizations for lending)? | Yes |
| j. FY 1988 Continuing Resolution Sec. 510. To finance the export of nuclear equipment, fuel, or technology? | Yes |
| k. FY 1988 Continuing Resolution Sec. 511. For the purpose of aiding the efforts of the government of such country to repress the legitimate rights of the population of such country contrary to the Universal Declaration of Human Rights? | Yes |
| l. FY 1988 Continuing Resolution Sec. 516; State Authorization Section 109. To be used for publicity or propaganda purposes designed to support or defeat legislation pending before Congress to influence in any way the outcome of a political election in the United States, or for any publicity or propaganda purposes not authorized by Congress? | Yes |

465

COUNTRY CHECKLIST

A. GENERAL CRITERIA FOR COUNTRY ELIGIBILITY

| | | |
|---|---|---|
| 1. | FY 1988 Continuing Resolution Sec. 526. Has the President certified to the Congress that the government of the recipient country is failing to take adequate measures to prevent narcotic drugs or other controlled substances which are cultivated, produced or processed illicitly, in whole or in part, in such country or transported through such country, from being sold illegally within the jurisdiction of such country to United States Government personnel or their dependents or from entering the United States unlawfully? | No |
| 2. | FAA Sec. 481(h). (This provision applies to assistance of any kind provided by grant, sale, loan, lease, credit, guaranty, or insurance, except assistance from the Child Survival Fund or relating to international narcotics control, disaster and refugee relief, or the provision of food or medicine.) If the recipient is a "major illicit drug producing country" (defined as a country producing during a fiscal year at least five metric tons of opium or 500 metric tons of coca or marijuana) or a "major drug-transit country" (defined as a country that is a significant direct source of illicit drugs significantly affecting the United States, through which such drugs are transported, or through which | N/A |

significant sums of drug-related profits are laundered with the knowledge or complicity of the government), has the President in the March 1 International Narcotics Control Strategy Report (INSCR) determined and certified to the Congress (without Congressional enactment, within 30 days of continuous session, of a resolution diapproving such a certification), or has the President determined and certified to the Congress on any other date (with enactment by Congress of a resolution approving such certification), that (a) during the previous year the country has cooperated fully with the United States or taken adequate steps on its own to prevent illicit drugs produced or processed in or transported through such country from being transported into the United States, and to prevent and punish drug profit laundering in the country, or that (b) the vital national interests of the United States require the provision of such assistance?

3. Drug Act Sec. 2013. (This section applies to the same categories of assistance subject to the restrictions in FAA Sec. 481(h), above.) If recipient country is a "major illicit drug producing country" or "major drug-transit country" (as defined for the purpose of FAA Sec 481(h)), has the President submitted a report to Congress listing such country as one (a) which, as a matter of government policy, encourages or facilitates the production or distribution of illicit drugs; (b) in which any senior official of the government engages in, encourages, or facilitates the production or distribution of illegal drugs; (c) in which any member of a U.S. Government N/A

agency has suffered or been threatened with violence inflicted by or with the complicity of any government officer; or (d) which fails to provide reasonable cooperation to lawful activities of U.S. drug enforcement agents, unless the President has provided the required certification to Congress pertaining to U.S. national interests and the drug control and criminal prosecution efforts of that country?

4. FAA Sec. 620(c). If assistance is to a government, is the government liable as debtor or unconditional guarantor on any debt to a U.S. citizen for goods or services furnished or ordered where (a) such citizen has exhausted available legal remedies and (b) the debt is not denied or contested by such government? — No

5. FAA Sec. 620(e)(1). If assistance is to a government, has it (including any government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities? — No

6. FAA Secs. 620(a), 620(f), 620D; FY 1988 Continuing Resolution Secs. 512. Is recipient country a Communist country? If so, has the President determined that assistance to the country is important to the national interests of the United States, that the recipient country is not controlled by the international Communist conspiracy, and that such assistance will further promote the independence of the recipient country from international communism? — No

468

| | |
|---|---|
| Will assistance be provided to Angola, Cambodia, Cuba, Iraq, Syria, Vietnam, Libya, Iran, or South Yemen? Will assistance be provided to Afghanistan without a certification? | No<br><br>N/A |
| 7. FAA Sec. 620(j). Has the country permitted, or failed to take adequate measures to prevent, damage or destruction by mob action of U.S. property? | No |
| 8. FAA Sec. 620(l). Has the country failed to enter into an investment guaranty agreement with OPIC? | No |
| 9. FAA Sec. 620(o); Fishermen's Protective Act of 1967 (as amended) Sec. 5. (a) Has the country seized, or imposed any penalty or sanction against, any U.S. fishing vessel because of fishing activities in international waters? (b) If so, has any deduction required by the Fishermen's Protective Act been made? | (a) No |
| 10. FAA Sec. 620(q); FY 1988 Continuing Resolution Sec. 518.<br>(a) Has the government of the recipient country been in default for more than six months on interest or principal of any loan to the country under the FAA?<br>(b) Has the country been in default for more than one year on interest or principal on any U.S. loan under a program for which the FY 1988 Continuing Resolution appropriates funds? | (a) Yes; however a bilateral agreement rescheduling such debt was signed 11/14/87.<br><br>(b) No |
| 11. FAA Sec. 620(s). If contemplated assistance is development loan or from Economic Support Fund, has the Administrator taken into account the percent of the country's budget and amount of the country's foreign exchange or other resources spent on military | Yes, taken into account by the Administrator at time of approval of Agency OYB. |

equipment? (Reference may be made to the annual "Taking Into Consideration" memo: "Yes, taken into account by the Administrator at time of approval of Agency OYB." This approval by the Administrator of the Operational Year Budget can be the basis for an affirmative answer during the fiscal year unless significant changes in circumstances occur.)

| | |
|---|---|
| 12. FAA Sec. 620(t). Has the country severed diplomatic relations with the United States? If so, have relations been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption? | No |
| 13. FAA Sec. 620(u). What is the payment status of the country's U.N. obligations? If the country is in arrears, were such arrearages taken into account by the A.I.D. Adminstrator in determining the current A.I.D. Operating Year Budget? (Reference may be made to the Taking into Consideration memo.) | Egypt is current on its UN obligations. |
| 14. FAA Sec. 620A. Has the President determined that the recipient country grants sanctuary from prosecution to any individual or group which has committed an act of international terrorism or otherwise supports international terrorism? | No |
| 15. ISDCA of 1985 Sec. 552(b). Has the Secretary of State determined that the country is a high terrorist threat country after the Secretary of Transportation has determined, pursuant to section 1115(e)(2) of the Federal Aviation Act of 1958, that an airport in the country does not maintain and administer effective security measures? | No |

16. FAA Sec. 666(b). Does the country object, on the basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. who is present in such country to carry out economic development programs under the FAA? No

17. FAA Secs. 669, 670. Has the country, after August 3, 1977, delivered to any other country or received nuclear enrichment or reprocessing equipment, materials, or technology, without specified arrangements or safeguards, and without special certification by the President? No
Has it transferred a nuclear explosive device to a non-nuclear weapon state, or if such a state, either received or detonated a nuclear explosive device? (FAA Sec. 620E permits a special waiver of Sec. 669 for Pakistan.) No

18. FAA Sec. 670. If the country is a non-nuclear weapon state, has it, on or after August 8, 1985, exported (or attempted to export) illegally from the United States any material, equipment, or technology which would contribute significantly to the ability of a country to manufacture a nuclear explosive device? No

19. ISDCA of 1981 Sec. 720. Was the country represented at the Meeting of Ministers of Foreign Affairs and Heads of Delegations of the Non-Aligned Countries to the 36th General Assembly of the U.N. on Sept. 25 and 28, 1981, and failed to disassociate itself from the communique issued? If so, has the President taken it into account? (Reference may be made to the Taking into Consideration memo.) No

411

20. FY 1988 Continuing Resolution Sec. 528(b). Has the recipient country been determined by the President to have engaged in a consistent pattern of opposition to the foreign policy of the United States? — No

21. FY 1988 Continuing Resolution Sec. 513. Has the duly elected Head of Government of the country been deposed by military coup or decree? If assistance has been termin ed, has the President notified Congress that a democratically elected government has taken office prior to the resumption of assistance? — No

22. FY 1988 Continuing Resolution Sec. 576. Has the country been placed on the list provided for in Section 6(j) of the Export Administration Act of 1979 (currently Libya, Iran, South Yemen, Syria, Cuba or North Korea)? — No

23. FY 1988 Continuing Resolution Sec. 543. Does the recipient country fully cooperate with the international refugee assistance organizations, the United States, and other governments in facilitating lasting solutions to refugee situations, including resettlement without respect to race, sex, religion or natural origin? — Yes

## B. FUNDING SOURCE CRITERIA FOR COUNTRY ELIGIBILITY

### 1. Development Assistance Country Criteria

FAA Sec. 116. Has the Department of State determined that this government has engaged in a consistent pattern of gross violations of internationally recognized human rights? If so, can it be demonstrated that contemplated assistance will directly benefit the needy? — N/A

417

| | |
|---|---|
| FY 1988 Continuing Resolution Sec. 538. Has the President certified that use of DA funds by this country would violate any of the prohibitions against use of funds to pay for the performance of abortions as a method of family planning, to motivate or coerce any person to practice abortions, to pay for the performance of involuntary sterilization as a method of family planning, to coerce or provide any financial incentive to any person to undergo sterilizations, to pay for any biomedical research which relates, in whole or in part, to methods of, or the performance of, abortions or involuntary sterilization as a means of family planning? | N/A |

2. Economic Support Fund Country Criteria

| | |
|---|---|
| FAA Sec. 502B. Has it been determined that the country has engaged in a consistent pattern of gross violations of internationally recognized human rights? If so, has the President found that the country made such significant improvement in its human rights record that furnishing such assistance is in the U.S. national interest? | No |
| FY 1988 Continuing Resolution Sec. 549. Has this country met its drug eradication targets or otherwise taken significant steps to halt illicit drug production or trafficking? | N/A |

## POLICY DETERMINATION 15

Foreign aid has been identified by some segments of the U.S. agricultural community as a significant contributing factor to the economic problems confronting the U.S. farm economy in general, and the agricultural export sector in particular. Section 209 of PL 99-349, enacted on July 2, 1986, responds to this concern. Known as the Bumpers Amendment it stipulates that none of the funds shall be available for any testing or breeding feasibility study, variety improvement or introduction, consultancy, publication, conference or training in connection with the growth of production in a foreign country of an agricultural commodity for export which would compete with a similar commodity grown or produced in the U.S., provided that the section shall not prohibit: (1) activities designed to increase food security in developing countries where such activities will not have a significant impact on the export of agricultural commodities of the United States; or (2) research activities intended primarily to benefit American producers.

This legislation is operationalized through Policy Determination No. 15 (PD-15) which states that it is AID Policy to avoid supporting the production of agricultural commodities for export by developing countries when the commodities would directly compete with exports of similar U.S. agricultural commodities to third countries and have a significant impact on U.S. exports. However, PD-15 also emphasizes that the goal of A.I.D. agricultural development assistance is to help the developing countries achieve self reliance through production and international trade of agricultural commodities that are economically viable.

Missions have been directed to examine whether or not an activity designed to increase the production of a particular commodity for export can reasonably be expected to have a significant impact on U.S. exports of that or a similar commodity. Proposed activities, as well as components of ongoing activities for which funds have not yet been obligated, which are likely to have a significant impact on exports of U.S. agricultural commodities to third markets should not be funded.

Examination of the export dimension of on-going and proposed projects is to include consideration of the following factors: (1) magnitude of production likely to result from the project; (2) export potential of the commodity in question; (3) likely export markets; (4) volume of U.S. exports of the commodity in question and similar commodities; and (5) the U.S. share of the world or regional market that could reasonably be expected to be affected by increased exports of the commodities.

PD-15 gives potentially conflicting messages. Agricultural assistance to support specialization and trade based on international comparative advantage could eventually lead to the export of products which compete with U.S exports. However, in the case of Egypt, the following analysis shows that Egypt's population growth and potential agricultural performance make it unlikely that Egypt could present any significant challenge to U.S. agricultural exports.

Agricultural Performance in Egypt

Egypt's food consumption has grown more rapidly than its agricultural production. A net exporter of agricultural products less than two decades ago, Egypt now imports about half of the food it needs to feed its population. Egypt is believed to have a potential for dramatic improvements in its agricultural production to compensate for the fast growth of its population (estimated at 2.7 percent per year), and for its limited agricultural land base, constantly eroded by urban growth. The NARP and other A.I.D. Agricultural Projects in Egypt attempt to help realize this potential and improve the overall performance of the agricultural sector. This is especially important because the oil related foreign exchange earnings which had enabled Egypt to pay for its food deficit have declined dramatically since 1986.

Potential conflict of PD-15 with USAID support for agricultural activities in Egypt has therefore, to be seen in the context of Egypt's large population growth, poor export performance and increased dependency on agricultural imports. Table 1 shows Egypt's recent exports in the agricultural sector.

**Table 1. Agricultural Exports of Egypt, 1982-87**
**(In Million of U.S. Dollars)**

| Description | FY82 | FY 83 | FY 84 | FY 85 | FY 86 | FY 87 |
|---|---|---|---|---|---|---|
| Agricultural goods | 647 | 616 | 752 | 624 | 475 | 467 |
| Cotton Lint | 430 | 387 | 522 | 435 | 356 | 343 |
| Rice | 36 | 11 | 19 | 10 | 5 | 4 |
| Oranges | 54 | 64 | 74 | 76 | 41 | 49 |
| Others | 127 | 154 | 137 | 102 | 52 | 54 |
| Industrial goods | 522 | 461 | 643 | 571 | 497 | 665 |
| Cotton Yarn | 174 | 156 | 225 | 225 | 196 | 241 |
| Cotton textiles | 31 | 27 | 52 | 58 | 41 | 57 |
| Textile Products | 26 | 21 | 25 | 26 | | |

Source: IMF, ARE - Recent Economic Developments, August 1986, for FY82 to FY85; CBE, FY86 and FY87.

This table highlights the generally weak performance of Egyptian agricultural exports while showing cotton and oranges to be the country's main exports. Table 2 shows the relative performance of the US and Egypt in the main export markets for these crops. Egypt's exports of rice are seen to be insignificant relative to the US and the world and, even in the Middle East which imports a quarter of Egyptian rice exports, Egypt's exports of rice were less than five percent of the US exports.

Table 2: Exports of Cotton, Rice and Oranges
(Thousand of Metric Tons)

| | USSR | Middle East | Western Europe | Asia | Africa | Total |
|---|---|---|---|---|---|---|
| **Rice** | | | | | | |
| World 1/ | | | | | | 12800 |
| USA 1/ | | 636 | 297 | 213 | 538 | 1906 |
| Egypt 2/ | | 24 | | | | 92 |
| **Cotton** | | | | | | |
| World 1/ | | | | | | 4454 |
| USA 3/ | | | 64 | 186 | 28 | 427 |
| Egypt 2/ | | | 29 | 25 | | 131 |
| **Oranges** | | | | | | |
| World | | | | | | |
| USA 3/ | | | 80 | 287 | | 490 |
| Egypt 2/ | 90 | 45 | | | | 165 |

Source: 1/ Foreign Agricultural Circular, USDA, August 1986
2/ Annual Situation Report: Egypt, USDA/FAS, 1987
3/ FATUS, Foreign Agricultural Trade of the U.S May/June 1987

Cotton would seem to pose a potential problem since Egypt's total cotton exports amount to 25 percent of the US cotton exports. We note, however, that Egypt produces and exports long and extra long staple cotton while the United States exports the short and medium staple but imports long and extra long staple cotton. Moreover, Egypt has been importing around eighty thousand tons of medium staple lint cotton, all from the United States, the only country that currently uses the technology needed to allay Egyptian concern not to import plant diseases which might harm domestic production.

Egyptian exports of oranges are significant relative to U.S. exports although, at present, the two countries export to different markets. Egypt exports around 75 percent of its oranges to the Soviet Union and the Middle East while the U.S. exports mainly to Asia and Western Europe. If Egypt were able to develop a potential for increasing exports of high quality oranges to Western Europe, that situation could raise, in the future, a potential conflict with PL 99-349. However, it is USAID's belief that any such development would occur as a result of improvements in Egypt's processing and export facilities and not as a result of activities funded by NARP.

The NARP project is not likely to have a significant adverse impact on U.S. agricultural exports. Given Egypt's limited agricultural land base and high and increasing population density, Egypts agriculture has to experience significant productivity increases to keep up with increasing consumption. If

current distortions in production are addressed, along with the improvements in productivity which the NARP supports, the export surplus for rice, cotton and oranges may experience some growth. The extent of this growth is difficult to predict especially because so much of it depends on developments on the policy front.

On balance, the outcome should be favorable to U.S. agricultural exports in general. Cotton export could increase significantly if domestic policies were changed to allow agricultural production on the basis of comparative advantage. This would lead to significantly higher U.S. exports of California medium-staple cotton to Egypt as Egypt substituted exports of long staple for import of shorter staple cotton. This could also lead to higher U.S. exports of feedgrains (maize and soybeans) and perhaps frozen meat to Egypt since significant increases in cotton acreage in Egypt would come at the expense of clover and Egyptian grown maize, currently used to feed a protected red meat market.

Significant increases in orange production may take place but Egypt's long standing difficulty in meeting quality standards for the Western European market probably precludes any significant challenge to US orange exports. Rice production could also improve -- mainly through higher yields since water availability limits the potential for expanded acreage. Most of the increased production would have to go into satisfying the higher domestic demand which would follow the improved local processing and marketing for rice and the increased income levels generated by a freer and more productive Egyptian economy. Some increases in Egyptian rice exports could also be expected. Since the U.S. exports a significant share of its rice exports to the Middle East, these exports could face some but probably insignificant competition.

In conclusion we are confident that the NARP will not lead to any significant problems to US exports to third countries. The strengthening of Egyptian agriculture through this project and the shift in the pattern of production according to comparative advantage implies higher exports of long staple cotton but higher Egyptian imports of California cotton, corn, soybeans, and frozen meat. Thus, U.S. agriculture would be likely to benefit as a result of NARP and related USAID support for the Egyptian Ministry of Agriculture.

Steve

# FACSIMILE TRANSMISSION REQUEST

AID/ANE/TR/ARD - FAX # (202) 647-6962

| | |
|---|---|
| Addressee's Name: Ed Stearns | Date: 8-11-88 |
| Organization: USAID/Cairo/ADO | No. of pages to follow 1 |
| City: Cairo | Fax Phone Number: 9-011-20-2-356-2932 |
| From: Barbara Turner | Organization: AID/ANE/TR[redacted] |
| Project: NARP | Activity No.: |
| Remarks: | |

U.S. Agency for International Development

Room 4440 NS

AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20523

Mr. Marshall D. Brown
Director
USAID/Cairo
c/o U.S. Embassy
Washington, D.C. 20520-7700

Dear Buster:

Thank you for keeping us posted on the developments in the Seeds Component of the National Agricultural Research Project (NARP).

We have reviewed the attachment to your letter, "Annex G (Policy Determination 15)" among Bureau staff and with the relevant PPC and S&T officers. Based on the information in your letter concerning Amendment #2, Annex G appears adequate. The analysis of the rice and cotton situations deals satisfactorily with those commodities. The effect the project will have on potential future orange production and orange exports is less clear.

Based on your letter and the discussion in Annex G, it would appear that the project's rehabilitation of "seed" processing capacity would not increase Egypt's capacity to produce oranges. The propagation of oranges involves a quite different process than increasing the production of cereal seed or even cotton seed.

We need to see the full project document to be certain about oranges.

Sincerely,

Barbara

Barbara Turner
Director
Office of Technical Resources
Bureau for Asia and Near East

cc: ANE/Egypt, Richard Brown

DATE:

ACTION MEMORANDUM FOR THE DIRECTOR

THRU: Edwin Stains, AD/AGR

FROM: Terry Hardt, AGR/ILD

SUBJECT: National Agricultural Research Project (NARP: 263-0152); Noncompetitive Procurement of Technical Assistance

Problem:

The anticipated amendment to the NARP adds a technology transfer component to the Project which is to be implemented, in part, by a technical assistance contractor. The NARP amendment also would moderately broaden the scope of the technical assistance component in the current project.

USAID has received a request from Dr. Ahmed Momtaz, Director General of the Agricultural Research Center, to approve an amendment to the Center's technical assistance contract with the Consortium for International Development (CID) to add the new TA components to CID's contract. This would increase the number of technical assistance team members under the existing contract from 11 to 14 persons and extend the full team another two years.

The majority of the 14 person team would remain until 1994 with a support staff and short term consultants as needed. The current contract is a Host Country contract and it was competitively procured.

The value of the additional services required is approximately $9.6 million, a 77 percent increase over the original $12.5 million contract amount.

Background:

The National Agricultural Research Project (NARP) was developed with the goal of increasing Egypt's agricultural productivity. Its purpose is "to strengthen the capability of the agricultural research community to provide a continuous flow of improved appropriate agricultural technology" to the farmers. Major emphasis has been on instituting research systems, but a few technology transfer activities were started under CID's current contract. For example, CID instituted an active in-service training

program for on-farm research, and a national agricultural information distribution system has been planned.

The NARP amendment will add several new components. The project's new purpose is to "improve the capability to provide farmers with productivity increasing technologies in a supporting policy environment." The project amendment will broaden the original focus on agricultural research to include technology transfer, policy analysis, and seed technology components.

Several previous AID funded projects have had extension components, but none of the projects dealt with the entire technology transfer system. USAID /Cairo has long debated issues surrounding the technology transfer component; but recent policy changes within the MOA make investment in this area attractive for the first time.

In the technology transfer component, the agricultural system will be strengthened by drawing technology from the research establishment and transferring it through public and private sector networks to the farmers. The Mission in amending the PP, concludes that the transfer of technology activities included in the original PP were too limited in scope and budget to adequately address the needs of the farmer and meet the objectives of the project. Therefore, the technology transfer activities under the NARP have been expanded and funded under a separate component.

The original CID team includes on-farm and interdisciplinary researchers, a training specialist, administrative staff, and a library specialist. The proposed contract, if approved, would add three persons to the TA team: one new researcher for aquaculture and two individuals to work on the technology transfer component of NARP.

Justification for Waiver Approval:

AID Handbook 11, Chapter 1, paragraph 2.4.2, requires that, when services are procured without competition, at least one of the appropriate waiver criteria must justify the waiver. There are three criteria which justify this waiver.

1. Under 2.4.2.a.2, competitive procurement can be waived if "special design or operational requirements require services available from only one source". CID is already under contract to provide research TA through 1992 with eleven full-time consultants and 78 person months of short term consultants. The amended NARP envisions only one significant addition to the research TA team -- the aquaculture specialist -- and a two year extension. Were no additional TA component called for in the NARP

amendment, there would be a very strong case indeed for amending CID's existing contract to include the new specialist and extending the contract two years. It would be unwise to have two contractors performing the research TA. Two research contractors would cause undue delay, generate conflict, and require additional AID management time. This would add up to additional cost both in dollar terms and in project success.

The NARP amendment envisions a close link between research and extension TA to ensure that the products of the research are not lost in the extension process.* Ideally, therefore, there should be only one contractor for the two types of TA for the reasons explained below in paragraph 3.

If CID is the obvious choice to complete the research TA component because of the scope and length of its current contract, and if the success of the research and extension TA components demands <u>one</u> TA contractor, CID is the only source.

2. Under paragraph 2.4.2.a.3, the competitive procurement requirement can be waived if "one firm can be demonstrated to have the unique capability by reason of experience or facilities, or specialized personnel who are recognized as predominant experts in that particular field, to perform the services in the project". CID, because of its experience with the Ministry of Agriculture and Land Reclamation for more than eight years, including two years on the NARP project, more than ten years experience with the Ministry of Irrigation (now PWWR), and its lead role in developing Egypt's research and extension program, has a unique capability to perform all of the TA services described in the amended NARP. For example, CID was the TA contractor for the Egyptian Major Cereals Improvement Project (EMCIP) and began many of the activities now carried out under NARP. Research and extension activities were begun for several major crops, and ultimately formed the basis for what is now known as National Campaigns. Two of the principal actors in this area under the EMCIP project (Coleen Brown and Gordon Beckstrand) are now here under CID contract to the NARP project. They are recognized experts on Egyptian research and technology transfer systems. In addition, CID's contract with PWWR has given them vast experience with Egyptian farmers and Water User Associations.

Moreover, CID's facilities for performing the TA contract in

---

* CID itself did not help design this link between research and extension TA components; the MOA and USAID take credit for the concept

Egypt are unique because CID is already here and will be, performing its existing contract, for the next few years. CID's facilities could serve both TA components with minimal adjustments, while two contractors would surely mean two separate sets of facilities in Egypt. The additional problems this would create are discussed below. In short, CID's capabilities are unique because of its past experience and what it is already committed to do in the future under its existing contract.

3. Finally, competition may be waived and sole source procurement authorized under paragraph 2.4.2.a.5, where "adherence to competitive procedures would result in the impairment of the objectives of the United States' foreign assistance program or would not be in the best interest of the United States". As discussed above, continuity between the research and technology transfer components is essential to successful completion of this project. One decisionmaker responsible for both activities is in the best interest of the US for two reasons. Both TA components will be implemented by the same GOE organization: the Agricultural Research Center. Having two contractors under the ARC would surely cause conflicts. Conflicts cause delays and the considerable US resources invested in the project to date would thereby be jeopardized. Even if there were no conflicts there would be delays simply because the two components would have different administrative and decision-making processes. Again, such delays, which would almost certainly occur, are inimical to our investment and interest in the project. Of course CID need not necessarily be the one contractor to perform both TA components. But as discussed above, CID has already contracted to perform much of the research TA; were a second contractor selected to provide the relatively minimal added research TA and the extension TA, we would effectively be left with two TA contractors and the project subjected to inevitable delays.

<u>Authority:</u>

Paragraph 8 of Redelegation of Authority No. 653 authorizes the Mission Director to waive competition for the procurement of goods and services, with regard to host country contracts or amendments thereto, without dollar limitation; provided however, that this

authority is exercised in consultation with the Mission Noncompetitive Review Board. The Board has approved this waiver; the members' clearances are indicated below.

Recommendation:

That you approve a waiver of competition to amend CID's existing contract when the NARP is amended to include the research and technology transfer TA components for a value of approximately $22.1 million.

Approved: _____

Disapproved: _____

Date: _____

Clearances:
LEG:MWard_____
AGR:SHaynes_____
PDS/PS:FMiller_____
FM:HPangan_____
AD/D:JPatterson_____

Mission Noncompetitive Review Board:

LEG:KO'Donnell_____
PDS/PS:WDuncan_____
MGT/CS:JDzierwa_____

DATE:

ACTION MEMORANDUM FOR THE DIRECTOR

THRU: Edwin Stains, AD/AGR

FROM: Terry Hardt, AGR/ILD

SUBJECT: National Agricultural Research Project (NARP: 263-0152); Noncompetitive Procurement of Technical Assistance

Problem:

The anticipated amendment to the NARP adds a technology transfer component to the Project which is to be implemented, in part, by a technical assistance contractor. The NARP amendment also would moderately broaden the scope of the technical assistance component in the current project.

USAID has received a request from Dr. Ahmed Momtaz, Director General of the Agricultural Research Center, to approve an amendment to the Center's technical assistance contract with the Consortium for International Development (CID) to add the new TA components to CID's contract. This would increase the number of technical assistance team members under the existing contract from 11 to 14 persons and extend the full team another two years.

The majority of the 14 person team would remain until 1994 with a support staff and short term consultants as needed. The current contract is a Host Country contract and it was competitively procured.

The value of the additional services required is approximately $9.6 million, a 77 percent increase over the original $12.5 million contract amount.

Background:

The National Agricultural Research Project (NARP) was developed with the goal of increasing Egypt's agricultural productivity. Its purpose is "to strengthen the capability of the agricultural research community to provide a continuous flow of improved appropriate agricultural technology" to the farmers. Major emphasis has been on instituting research systems, but a few technology transfer activities were started under CID's current contract. For example, CID instituted an active in service training

program for on-farm research, and a national agricultural information distribution system has been planned.

The NARP amendment will add several new components. The project's new purpose is to "improve the capability to provide farmers with productivity increasing technologies in a supporting policy environment." The project amendment will broaden the original focus on agricultural research to include technology transfer, policy analysis, and seed technology components.

Several previous AID funded projects have had extension components, but none of the projects dealt with the entire technology transfer system. USAID /Cairo has long debated issues surrounding the technology transfer component; but recent policy changes within the MOA make investment in this area attractive for the first time.

In the technology transfer component, the agricultural system will be strengthened by drawing technology from the research establishment and transferring it through public and private sector networks to the farmers. The Mission in amending the PP, concludes that the transfer of technology activities included in the original PP were too limited in scope and budget to adequately address the needs of the farmer and meet the objectives of the project. Therefore, the technology transfer activities under the NARP have been expanded and funded under a separate component.

The original CID team includes on-farm and interdisciplinary researchers, a training specialist, administrative staff, and a library specialist. The proposed contract, if approved, would add three persons to the TA team: one new researcher for aquaculture and two individuals to work on the technology transfer component of NARP.

Justification for Waiver Approval:

AID Handbook 11, Chapter 1, paragraph 2.4.2, requires that, when services are procured without competition, at least one of the appropriate waiver criteria must justify the waiver. There are three criteria which justify this waiver.

1. Under 2.4.2.a.2, competitive procurement can be waived if "special design or operational requirements require services available from only one source". CID is already under contract to provide research TA through 1992 with eleven full-time consultants and 78 person months of short term consultants. The amended NARP envisions only one significant addition to the research TA team -- the aquaculture specialist -- and a two year extension Were no additional TA component called for in the NARP

amendment, there would be a very strong case indeed for amending CID's existing contract to include the new specialist and extending the contract two years. It would be unwise to have two contractors performing the research TA. Two research contractors would cause undue delay, generate conflict, and require additional AID management time. This would add up to additional cost both in dollar terms and in project success.

The NARP amendment envisions a close link between research and extension TA to ensure that the products of the research are not lost in the extension process.* Ideally, therefore, there should be only one contractor for the two types of TA for the reasons explained below in paragraph 3.

If CID is the obvious choice to complete the research TA component because of the scope and length of its current contract, and if the success of the research and extension TA components demands <u>one</u> TA contractor, CID is the only source.

2. Under paragraph 2.4.2.a.3, the competitive procurement requirement can be waived if "one firm can be demonstrated to have the unique capability by reason of experience or facilities, or specialized personnel who are recognized as predominant experts in that particular field, to perform the services in the project". CID, because of its experience with the Ministry of Agriculture and Land Reclamation for more than eight years, including two years on the NARP project, more than ten years experience with the Ministry of Irrigation (now PWWR), and its lead role in developing Egypt's research and extension program, has a unique capability to perform all of the TA services described in the amended NARP. For example, CID was the TA contractor for the Egyptian Major Cereals Improvement Project (EMCIP) and began many of the activities now carried out under NARP. Research and extension activities were begun for several major crops, and ultimately formed the basis for what is now known as National Campaigns. Two of the principal actors in this area under the EMCIP project (Coleen Brown and Gordon Beckstrand) are now here under CID contract to the NARP project. They are recognized experts on Egyptian research and technology transfer systems. In addition, CID's contract with PWWR has given them vast experience with Egyptian farmers and Water User Associations.

Moreover, CID's facilities for performing the TA contract in

---

* CID itself did not help design this link between research and extension TA components; the MOA and USAID take credit for the concept

Egypt are unique because CID is already here and will be, performing its existing contract, for the next few years. CID's facilities could serve both TA components with minimal adjustments, while two contractors would surely mean two separate sets of facilities in Egypt. The additional problems this would create are discussed below. In short, CID's capabilities are unique because of its past experience and what it is already committed to do in the future under its existing contract.

3. Finally, competition may be waived and sole source procurement authorized under paragraph 2.4.2.a.5, where "adherence to competitive procedures would result in the impairment of the objectives of the United States' foreign assistance program or would not be in the best interest of the United States". As discussed above, continuity between the research and technology transfer components is essential to successful completion of this project. One decisionmaker responsible for both activities is in the best interest of the US for two reasons. Both TA components will be implemented by the same GOE organization: the Agricultural Research Center. Having two contractors under the ARC would surely cause conflicts. Conflicts cause delays and the considerable US resources invested in the project to date would thereby be jeopardized. Even if there were no conflicts there would be delays simply because the two components would have different administrative and decision-making processes. Again, such delays, which would almost certainly occur, are inimical to our investment and interest in the project. Of course CID need not necessarily be the one contractor to perform both TA components. But as discussed above, CID has already contracted to perform much of the research TA; were a second contractor selected to provide the relatively minimal added research TA and the extension TA, we would effectively be left with two TA contractors and the project subjected to inevitable delays.

Authority:

Paragraph 8 of Redelegation of Authority No. 653 authorizes the Mission Director to waive competition for the procurement of goods and services, with regard to host country contracts or amendments thereto, without dollar limitation; provided however, that this

authority is exercised in consultation with the Mission Noncompetitive Review Board. The Board has approved this waiver; the members' clearances are indicated below.

Recommendation:

That you approve a waiver of competition to amend CID's existing contract when the NARP is amended to include the research and technology transfer TA components for a value of approximately $22.1 million.

Approved: _____

Disapproved: _____

Date: _____

Clearances:
LEG:MWard_____
AGR:SHaynes_____
PDS/PS:FMiller_____
FM:HPangan_____
AD/D:JPatterson_____

Mission Noncompetitive Review Board:

LEG:KO'Donnell_____
PDS/PS:WDuncan_____
MGT/CS:JDzierwa_____



484

## Waiver Request No. 1

Subject: Request to Waive Geographic Source from Code 941 to Code 935 and unit price limitation for AID Local Cost Financing of Shelf Items.

Problem: Handbook 1B, Chapter 18, Section A.4.b. states that shelf items having their origin in any country included in Code 899 but not in Code 941 are eligible for local cost financing if the price of one unit of such item does not exceed $5,000 and if the total amount of such shelf item purchases does not exceed $250,000. If total shelf item purchases are expected to exceed $250,000, a geographic source waiver is required. For the NARP project, it is estimated that total shelf item purchases of items having their origin in countries included in Code 935 but not in Code 941 will be approximately $10 million, and some of these items are expected to cost up to the Egyptian Pound equivalent of $10,000.

Background: The amended NARP project has a total value of $300 million. Under the project, laboratories and other research related structures and facilities will be renovated and equipped, and computer systems will be provided for data analysis and information cataloging and retrieval. Vehicles will be procured to enable travel to and from research, training and related work sites. Research, technology transfer, and data collection activities will be carried out in Egypt. Many research experiments will be on a laboratory/trial scale and, if successful, may be expanded to a pilot scale. Some of the supplies/equipment anticipated for purchase include: farm implements, laboratory and transportation equipment, chemicals, production inputs (fertilizers, pesticides, etc.), office equipment, personal computers, and

software for the microcomputer-based technology programs. All goods contemplated will be eligible for AID local cost financing subject to approval of this waiver and AID environmental regulations in the case of pesticides. It is also anticipated that there will be a need to purchase spare parts in the local market for inoperable equipment already available at research stations which, if repaired, will save purchasing/replacing this equipment.

Because of the nature of the NARP project, it is expected that there will be a continuing need for purchases in the local market (e.g., chemicals, supplies, small pieces of laboratory and office equipment, and spare parts) so that the research and related activities can be carried out in a timely and efficient manner. It is our experience from NARP procurement to date that imported shelf item prices are not unreasonable in view of their ready availability. Based on previous experience in similar projects, we estimate the cost of locally procured materials and supplies for the project to total approximately $10 million from Code 935 countries. In addition, we anticipate that some research project commodities, such as small laboratory and office equipment, may exceed the $5,000 limit in unit price of imported shelf items. A $10,000 limit on unit price is needed for this type of procurement.

Authority: The Mission Director is authorized: (a) by paragraph 7(b) of Delegation of Authority No. 653 (DOA 653) to approve waivers of Code 941 source requirements to Code 935 without dollar limitation; and (b) by paragraph 11 of such delegation, the Mission Director may waive the $5,000 unit price limitation for local cost procurement.

Recommendation: That the Mission Director grant a geographic code source waiver to permit the procurement of shelf items in Code 935 countries up to $10,000,000 and increase the

permissible unit price limit of such items to $10,000. The Mission Director's approval of this waiver request on the Project Authorization will constitute his certification, in accordance with DOA 653, para 7(b)(1), that: "Exclusion of procurement from free world countries other than the cooperating country and countries included in Code 941 would seriously impede attainment of U.S. foreign policy objectives and objectives of the foreign assistance program."

Doc NO. WAIVER1, Disk NO. 33, sk

## Waiver Request No. 1

Subject: Request to Waive Geographic Source from Code 941 to Code 935 and unit price limitation for AID Local Cost Financing of Shelf Items.

Problem: Handbook 1B, Chapter 18, Section A.4.b. states that shelf items having their origin in any country included in Code 899 but not in Code 941 are eligible for local cost financing if the price of one unit of such item does not exceed $5,000 and if the total amount of such shelf item purchases does not exceed $250,000. If total shelf item purchases are expected to exceed $250,000, a geographic source waiver is required. For the NARP project, it is estimated that total shelf item purchases of items having their origin in countries included in Code 935 but not in Code 941 will be approximately $10 million, and some of these items are expected to cost up to the Egyptian Pound equivalent of $10,000.

Background: The amended NARP project has a total value of $300 million. Under the project, laboratories and other research related structures and facilities will be renovated and equipped, and computer systems will be provided for data analysis and information cataloging and retrieval. Vehicles will be procured to enable travel to and from research, training and related work sites. Research, technology transfer, and data collection activities will be carried out in Egypt. Many research experiments will be on a laboratory/trial scale and, if successful, may be expanded to a pilot scale. Some of the supplies/equipment anticipated for purchase include: farm implements, laboratory and transportation equipment, chemicals, production inputs (fertilizers, pesticides, etc.), office equipment, personal computers, and

software for the microcomputer-based technology programs. All goods contemplated will be eligible for AID local cost financing subject to approval of this waiver and AID environmental regulations in the case of pesticides. It is also anticipated that there will be a need to purchase spare parts in the local market for inoperable equipment already available at research stations which, if repaired, will save purchasing/replacing this equipment.

Because of the nature of the NARP project, it is expected that there will be a continuing need for purchases in the local market (e.g., chemicals, supplies, small pieces of laboratory and office equipment, and spare parts) so that the research and related activities can be carried out in a timely and efficient manner. It is our experience from NARP procurement to date that imported shelf item prices are not unreasonable in view of their ready availability. Based on previous experience in similar projects, we estimate the cost of locally procured materials and supplies for the project to total approximately $10 million from Code 935 countries. In addition, we anticipate that some research project commodities, such as small laboratory and office equipment, may exceed the $5,000 limit in unit price of imported shelf items. A $10,000 limit on unit price is needed for this type of procurement.

Authority: The Mission Director is authorized: (a) by paragraph 7(b) of Delegation of Authority No. 653 (DOA 653) to approve waivers of Code 941 source requirements to Code 935 without dollar limitation; and (b) by paragraph 11 of such delegation, the Mission Director may waive the $5,000 unit price limitation for local cost procurement.

Recommendation: That the Mission Director grant a geographic code source waiver to permit the procurement of shelf items in Code 935 countries up to $10,000,000 and increase the

permissible unit price limit of such items to $10,000. The Mission Director's approval of this waiver request on the Project Authorization will constitute his certification, in accordance with DOA 653, para 7(b)(1), that: "Exclusion of procurement from free world countries other than the cooperating country and countries included in Code 941 would seriously impede attainment of U.S. foreign policy objectives and objectives of the foreign assistance program."

Doc NO. WAIVER1, Disk NO. 33, sk

ANNEX E

# IMPLEMENTATION SCHEDULE
## CALENDAR YEAR

| ACTIVITY | 1986 QUARTER 1 | 2 | 3 | 4 | 1987 QUARTER 1 | 2 | 3 | 4 | 1988 QUARTER 1 | 2 | 3 | 4 | 1989 QUARTER 1 | 2 | 3 | 4 | 1990 QUARTER 1 | 2 | 3 | 4 | '91 QUARTER 1 | 2 | 3 | 4 | 1992 QUARTER 1 | 2 | 3 | 4 | 1993 QUARTER 1 | 2 | 3 | 4 | 1994 QUARTER 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| I. RESEARCH COMPONENT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A. TECHNICAL ASSISTANCE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Long Term (CID) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. Chief-of-Party (95 mm) | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x |
| b. Res. Station Mgt. (95 mm) | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x |
| c. On-Farm Res. Demo. (95 mm) | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x |
| d. Res. Studies Cood. (95 mm) | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x |
| e. Admin. Services (95 mm) | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x |
| f. Interdisc. Research (95 mm) | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x |
| g. Library/Info. Science (95 mm) | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x |
| h. Crop Protection (95 mm) | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x |
| i. Training/Manpower Dev. (95 mm) | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x |
| j. Ag Machinery Spt. (89 mm) | | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x |
| k. Aquaculture (36 mm) | | | | | | | | | | | | x | — | — | — | — | — | — | — | — | — | — | x | | | | | | | | | | | | | x |
| 2. Short-Term (CID) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. Various Spec. (75 mm) | | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | | x | | x | x | x | x | x | x | x | x | x |
| b. On-Campus (72 mm) | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | | x | | x | x | x | x | x | x | x | x | x |
| c. In-Country Staff (72 mm) | | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | | x | | x | x | x | x | x | x | x | x | x |
| d. Institutional Staff (54 mm) | | | | | | x | | x | | x | | x | | x | | x | | x | | x | | x | | x | | x | | x | | x | | x | | x | | x |
| e. Admin. Staff (72 mm) | | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |

| ACTIVITY | 1986 QUARTER 1 | 2 | 3 | 4 | 1987 QUARTER 1 | 2 | 3 | 4 | 1988 QUARTER 1 | 2 | 3 | 4 | 1989 QUARTER 1 | 2 | 3 | 4 | 1990 QUARTER 1 | 2 | 3 | 4 | 1991 QUARTER 1 | 2 | 3 | 4 | 1992 QUARTER 1 | 2 | 3 | 4 | 1993 QUARTER 1 | 2 | 3 | 4 | 1994 QUARTER 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **B. TRAINING** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Off-Shore | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. Master Plan Prepared/Approved | | | | | x | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| b. Academic (76) plus 39 Carryovers | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x |
| c. Post Doctorate (200) | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | x | | | | | |
| d. Short-Term (290) | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | x | | | | | |
| 2. Training Procurement (Off-Shore) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. RFP Proposed/Issued | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| b. Contractor Identified | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | |
| c. Delivery of Services | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | x |
| 3. In-Country Training | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. Plan Proposed/Approved | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| b. Delivery of Services | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x |
| c. Other In-Country Train (English) | | | | | | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | | |

| ACTIVITY | 1986 QUARTER | | | | 1987 QUARTER | | | | 1988 QUARTER | | | | 1989 QUARTER | | | | 1990 QUARTER | | | | 1991 QUARTER | | | | 1992 QUARTER | | | | 1993 QUARTER | | | | 1994 QUARTER | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| **C. COMMODITIES** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Lab Equipment & Supplies | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. Inventory Completed | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| b. Procurement Plan Approved | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| c. IFB Prepared/Issued | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| d. Contractor Selected | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | |
| e. Equipment Delivered | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | |
| 2. Farm Equipment | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. Inventory Completed | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| b. Procurement Plan Approved | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| c. IFB Prepared/Issued | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| d. Contractor Selected | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | |
| e. Equipment Delivered | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | |
| 3. Library Equipment | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. Procurement Plan Approved | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| b. IFB Prepared/Issued | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| c. Contractor Selected | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| d. Goods Delivered | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | |

| ACTIVITY | 1986 QUARTER 1 | 2 | 3 | 4 | 1987 QUARTER 1 | 2 | 3 | 4 | 1988 QUARTER 1 | 2 | 3 | 4 | 1989 QUARTER 1 | 2 | 3 | 4 | 1990 QUARTER 1 | 2 | 3 | 4 | 1991 QUARTER 1 | 2 | 3 | 4 | 1992 QUARTER 1 | 2 | 3 | 4 | 1993 QUARTER 1 | 2 | 3 | 4 | 1994 QUARTER 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4. Vehicles | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. Procurement Plan Approved | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | |
| b. IFB Prepared/Issued | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | |
| c. Contractor Selected | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | |
| d. Vehicles Delivered | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | |
| 5. Office Equipment | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. Procurement Plan Approved | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | |
| b. IFB Prepared/Issued | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | |
| c. Contractor Selected | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | |
| d. Equipment Delivered | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | |
| D. SERVICES | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Maintenance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. Maintenance Plan Prepared/Approved | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | |
| b. RFP for Local Services Issued | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | |
| c. Contractor Selected | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | |
| d. Shops Become Operational | | | | | | | | | | | | | | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x |
| 2. Renovation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. Renovation Plan Prepared/Approved | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| b. FAR Agreement Negotiated | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| c. A&E Contractor Selected | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| d. Construction Contracts Approved | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | |
| e. Renovation Completed | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | |
| 3. Research Support Program | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. Annual Plans/Target Approved | | | | x | | | | | | | x | | | | x | | | | | x | | | x | | | | | | | | | | | | | |
| b. PIL Issued | | | | x | | | | | | | x | | | | x | | | | | x | | | x | | | | | | | | x | | | | | |
| c. Advance Provided | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x | | | | | | | | | |
| d. Research Proposal Executed | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x | | | | | | | | | |

| ACTIVITY | 1986 QUARTER 1 | 2 | 3 | 4 | 1987 QUARTER 1 | 2 | 3 | 4 | 1988 QUARTER 1 | 2 | 3 | 4 | 1989 QUARTER 1 | 2 | 3 | 4 | 1990 QUARTER 1 | 2 | 3 | 4 | 1991 QUARTER 1 | 2 | 3 | 4 | 1992 QUARTER 1 | 2 | 3 | 4 | 1993 QUARTER 1 | 2 | 3 | 4 | 1984 QUARTER 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4. Research Grant Program | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. Operations Manual Prepared/Approved | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| b. Proposals Solicited | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| c. Proposals Submitted | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| d. Proposals Screened | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | |
| e. Proposals/Plans Approved | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | |
| f. Grants Awarded | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | |
| g. Research Conducted. | | | | | | | | | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x |
| 5. International Collaborative | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. Areas of Mutual Interest Identified | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | |
| b. Research Work Plan Approved | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | |
| c. Research conducted | | | | | | | | | | | | | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x | | | |
| 6. Land Improvements and Communications | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. Plans Prepared/Approved | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | |
| b. Commodities Purchased | | | | | | | | | | | x | — | — | — | — | x | | | | | | | | | | | | | | | | | | | | |
| c. Contractors Selected/Awarded | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | |
| d. Work Completed | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | |
| 7. Rice Research (IRRI) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. Chief-of-Party | | | | | | | | x | — | — | — | — | — | — | — | — | — | — | — | x | | | | | | | | | | | | | | | | |
| b. Plant Pathologist | | | | | | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | x | | | | | | | | | | | | | |
| c. Plant Breeder | | | | | | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | x | | | | | | | | | | | | | |

| ACTIVITY | 1986 QUARTER 1 | 2 | 3 | 4 | 1987 QUARTER 1 | 2 | 3 | 4 | 1988 QUARTER 1 | 2 | 3 | 4 | 1989 QUARTER 1 | 2 | 3 | 4 | 1990 QUARTER 1 | 2 | 3 | 4 | 1991 QUARTER 1 | 2 | 3 | 4 | 1992 QUARTER 1 | 2 | 3 | 4 | 1993 QUARTER 1 | 2 | 3 | 4 | 1994 QUARTER 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **II. POLICY COMPONENT** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **A. TECHNICAL ASSISTANCE** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. PASA with USDA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. A-76 Prepared/Approved | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| b. LT Data Processing Advisor (24 mm) | | | | | | | | x | | | | | | | | x | | | | | | | | | | | | | | | | | | | | |
| c. ST as Required | | | | | | | | | x | x | x | x | x | | | | | | | | | | | | | | | | | | | | | | | |
| 2. TA Support (Year 1) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. PSC Ag Economist (12 mm) | | | | | | | | | | | x | | | | x | | | | | | | | | | | | | | | | | | | | | |
| b. PSC Statistician (12 mm) | | | | | | | | | | | x | | | | x | | | | | | | | | | | | | | | | | | | | | |
| 3. Prime Contractor | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. RFP Prepared/Issued | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | |
| b. Contractor Selected | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | |
| c. Long Term | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| i. Data Processing Spt. (48 mm) | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | x | | | | |
| ii. Ag Econ. (72 mm) | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | x |
| iii. Statistician (60 mm) | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | x | | | | |
| iv. Mgt Specialist (72 mm) | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | x |
| v. Ag/Info Econ. (48 mm) | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | x | | | | | | |
| d. Short-Term TA (240 mm) | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | x | | | | |
| **B. TRAINING** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Off-Shore | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. Training Plan Prepared/ Approved | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | |
| b. Academic Trainees Selected | | | | | | | | | | | | | | x | | | | x | | | | | | | | | | | | | | | | | | |
| c. Short-Term Trainees Selected | | | | | | | | | | | | | | x | | | | x | | | | | | | | | | | | | | | | | | |

| ACTIVITY | 1986 QUARTER 1 | 2 | 3 | 4 | 1987 QUARTER 1 | 2 | 3 | 4 | 1988 QUARTER 1 | 2 | 3 | 4 | 1989 QUARTER 1 | 2 | 3 | 4 | 1990 QUARTER 1 | 2 | 3 | 4 | 1991 QUARTER 1 | 2 | 3 | 4 | 1992 QUARTER 1 | 2 | 3 | 4 | 1993 QUARTER 1 | 2 | 3 | 4 | 1994 QUARTER 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2. In-Country Training | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. Plan Proposed/Approved | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | |
| b. Contractors Selected | | | | | | | | | | | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x | | | | |
| c. Delivery of Services | | | | | | | | | | | | | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x | | | | |
| d. Other In-Country Training, English, Computer, etc. | | | | | | | | | | | | | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x | | | | |
| C. POLICY ANALYSIS & DIALOGUE MONITORING | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. Organizational Assessment | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | |
| b. Organizational Strengthening | | | | | | | | | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x | | | | |
| c. Questionnaire/Policy Verification Studies executed | | | | | | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x | | | | |
| d. Data Analyzed | | | | | | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x | | | | |
| e. Policy Altern. Identified | | | | | | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x | | | | |
| f. Information Exchanged | | | | | | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x | | | | |
| D. STATISTICAL ANALYSIS & DATA PROCESSING | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. Operationalize Computer Center | | | | | | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x | | | | |
| b. Estab. Nat'l Sample Frames | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | |
| c. Develop Data Collection Plans | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | |
| c. Develop/Execute Internal Trang. Plans | | | | | | | | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x | | | | |
| d. Strengthen Gov. Offices | | | | | | | | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x | | | | |
| e. Establish Info Center | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | |
| E. COMMODITIES — MOA/U/AES/Contractor | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. Procurement Plan Approved | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | |
| b. IFB Approved/Issued | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | |
| c. Contractor Selected | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | |
| d. Equipment Delivered | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | |

| ACTIVITY | 1986 QUARTER 1 | 2 | 3 | 4 | 1987 QUARTER 1 | 2 | 3 | 4 | 1988 QUARTER 1 | 2 | 3 | 4 | 1989 QUARTER 1 | 2 | 3 | 4 | 1990 QUARTER 1 | 2 | 3 | 4 | 1991 QUARTER 1 | 2 | 3 | 4 | 1992 QUARTER 1 | 2 | 3 | 4 | 1993 QUARTER 1 | 2 | 3 | 4 | 1994 QUARTER 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **III. Tech. Transfer Component** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **A. TECHNICAL ASSISTANCE** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. CID Contract Amended | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | |
| b. Ext. Specialist (72 mm) | | | | | | | | | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x |
| c. Ext. Specialist (72 mm) | | | | | | | | | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x |
| d. ST Services (182 mm) | | | | | | | | | | | | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | | | | |
| **B. TRAINING** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Off-Shore | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. Training Plan Prepared/ Approved | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | |
| b. Academic Trainees Selected | | | | | | | | | | | | | | x | | | | x | | | | | | | | | | | | | | | | | | |
| c. Post-Doc. Trainees Selected | | | | | | | | | | | | | | x | | | | x | | | | | | | | | | | | | | | | | | |
| d. Short Term Trainees Selected | | | | | | | | | | | | | | x | | | | x | | | | | | | | | | | | | | | | | | |
| 2. In-Country Training | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. Plan Proposed/Approved | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | |
| b. Contractors selected | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | |
| c. Delivery of Services | | | | | | | | | | | | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x |
| d. Other In-Country Training, English, Computer, etc. | | | | | | | | | | | | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x | | | | |

| ACTIVITY | | 1986 QUARTER 1 | 2 | 3 | 4 | 1987 QUARTER 1 | 2 | 3 | 4 | 1988 QUARTER 1 | 2 | 3 | 4 | 1989 QUARTER 1 | 2 | 3 | 4 | 1990 QUARTER 1 | 2 | 3 | 4 | 1991 QUARTER 1 | 2 | 3 | 4 | 1992 QUARTER 1 | 2 | 3 | 4 | 1993 QUARTER 1 | 2 | 3 | 4 | 1994 QUARTER 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **C. RENOVATION** | ARC/Contractor | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Plans Prepared/Approved | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | |
| 2. Contract Advertised | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | x | | | | |
| 3. PIL Issued | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | x | | | | |
| 3. Contracts Executed | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | x | | | | |
| **D. COMMODITIES** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Office/Computer Equipment | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. Procurement Plan Approved | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | |
| b. IFB Prepared/Issued | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | |
| c. Contractor Selected | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | |
| d. Equipment Delivered | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | |
| 2. Mass Media Equipment | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. Procurement Plan Approved | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | |
| b. IFB Prepared/Issued | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | |
| c. Contractor Selected | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | |
| d. Equipment delivered | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | |
| 3. Vehicles | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. Procurement Plan Approved | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | |
| b. IFB Prepared/Issued | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | |
| c. Contractor Selected | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | |
| d. Vehicles Delivered | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | |
| **E. ACTIVITIES** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Administrative Services | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. Implementation Unit Established/Operating | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | x |
| b. Staff Identified/Contracted | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | x |

| ACTIVITY | 1986 QUARTER 1 | 2 | 3 | 4 | 1987 QUARTER 1 | 2 | 3 | 4 | 1988 QUARTER 1 | 2 | 3 | 4 | 1989 QUARTER 1 | 2 | 3 | 4 | 1990 QUARTER 1 | 2 | 3 | 4 | 1991 QUARTER 1 | 2 | 3 | 4 | 1992 QUARTER 1 | 2 | 3 | 4 | 1993 QUARTER 1 | 2 | 3 | 4 | 1994 QUARTER 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2. Strengthening Planning/Mgt | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. Finalize Governorate Guidelines/Procedures | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | |
| b. Finalize Non-Public Ext. Guidelines/Procedures | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | |
| c. Finalize LOPP/ST Governorate Plan | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | |
| d. Address Institutional Constraints | | | | | | | | | | | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x |
| 3. Improve Decentralized Public Extension | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. Establish Govern. Councils | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | |
| b. Approve Govern. Plans | | | | | | | | | | | | | x | | | | | | | | | | x | | | | x | | | | x | | | | | x |
| c. Establish Tech. AdvisoryCommittees | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | |
| d. Provide Implementation Support to Govern. Plans | | | | | | | | | | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x |
| 4. Support Non-Public Extension | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. Advertise & Promote Program | | | | | | | | | | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x |
| b. Assist in prep/Submit Proposals | | | | | | | | | | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x |
| c. Support Grant Approv/Fund. Process | | | | | | | | | | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x |
| 5. Streng. Res. Tech. Transfer | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a. AERDRI Conducts Studies | | | | | | | | | | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x |
| b. Train SMS/Exten. Agents | | | | | | | | | | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x |
| c. Ext. Mgt Train. Conducted | | | | | | | | | | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x |

| ACTIVITY | 1986 QUARTER 1 | 2 | 3 | 4 | 1987 QUARTER 1 | 2 | 3 | 4 | 1988 QUARTER 1 | 2 | 3 | 4 | 1989 QUARTER 1 | 2 | 3 | 4 | 1990 QUARTER 1 | 2 | 3 | 4 | 1991 QUARTER 1 | 2 | 3 | 4 | 1992 QUARTER 1 | 2 | 3 | 4 | 1993 QUARTER 1 | 2 | 3 | 4 | 1994 QUARTER 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **IV. SEED TECHNOLOGY** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **A. Technical Assistance** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. LT Seed Advisor (89 mm)ial | | | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x |
| 2. ST as Required (7 mm) | | | | | | | | | | | | | | | x | x | | | x | x | | | x | | | | x | | | | x | | | | | |
| **B. Training** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Training Plan Prepared/Approved | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | |
| 2. Academic Trainees Selected | | | | | | | | | | | | | | | x | | | | x | | | | | | | | | | | | | | | | | |
| 3. Short-Term Trainees Selected | | | | | | | | | | | | | | | x | x | x | x | x | x | x | x | · | · | x | x | x | x | x | x | x | | | | | |
| **C. Commodities** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Procurement Plan Prepared/Approved | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. IFB Prepared/Issued | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | |
| 3. Contractor Selected | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | |
| 4. Equipment Delivered | | | | | | | | | | | | | | | | x | — | — | — | — | — | — | — | — | — | — | x | | | | | | | | | |
| **D. Renovation** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Renovation PLan Prepared/Approved | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. Contractor Selected | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | |
| 3. Renovation Completed | | | | | | | | | | | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | x | | | | | | | | |

| ACTIVITY | 1986 QUARTER 1 | 2 | 3 | 4 | 1987 QUARTER 1 | 2 | 3 | 4 | 1988 QUARTER 1 | 2 | 3 | 4 | 1989 QUARTER 1 | 2 | 3 | 4 | 1990 QUARTER 1 | 2 | 3 | 4 | 1991 QUARTER 1 | 2 | 3 | 4 | 1992 QUARTER 1 | 2 | 3 | 4 | 1993 QUARTER 1 | 2 | 3 | 4 | 1994 QUARTER 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **V. NEW INITIATIVES** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **A. Technical Assistance** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. LT Managment Spt. (96 mm) | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x |
| 2. LT Management Asst. (66 mm) | | | | | | | | | | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x |
| 3. ST as Required (74 mm) | | | | | | | | | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | | | | |
| **B. Training** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. LT Training | | | | | | | | | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x | | | |
| 2. ST Training | | | | | | | | | | | | | | | x | | | | x | | | | x | | | | x | | | | x | | | | | |
| 3. Seminars | | | | | | | | | | | | | | | x | | | | x | | | | x | | | | x | | | | x | | | | | |
| **C. Administration** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Project Support | | | | | | | | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x |
| 2. Executive Office Support | | x | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | x |
| **D. Evaluation ad Audit** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Assessment of ARC & U/AES | | | | | | | | | | | | x | | | x | | | | | | | | | | | | | | | | | | | | | |
| 2. Mid-Term Evaluation | | | | | | | | | | | | | | | | | | | | x | x | | | | | | | | | | | | | | | |
| 3. Final Evaluation | | | | | | | | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | |
| 4. Audit | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | x | x | |

ANNEX F

# FIRST AMENDMENT TO PROJECT AUTHORIZATION

Name of Country: Arab Republic of Egypt

Name of Project: National Agricultural Research Project

Number of Project: 263-0152

1. Pursuant to Sections 531 and 532 of the Foreign Assistance Act of 1961, as amended (the "Act"), the National Agricultural Research Project was authorized on July 30, 1985. The authorization is hereby amended as follows:

a. Paragraph 1 is amended in its entirety to read as follows:

"1. Pursuant to Sections 531 and 532 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the National Agricultural Research Project for the Arab Republic of Egypt (the "Cooperating Country") involving planned obligations of not to exceed Three Hundred Million Dollars ($300,000,000) in grant funds over an eight-year period from the date of the authorization, subject to the availability of funds in accordance with the AID OYB allotment process, to help in financing foreign exchange and local currency costs of goods and services required for the Project. The planned life of the Project is nine years from the date of initial obligation."

b. Paragraph 2 is amended in its entirety to read as follows:

"The Project will improve data collection and analysis; technology generation, technology transfer and policy analysis/formulation processes; information utilization and dissemination; seed production capabilities; and agricultural research facilities, all with a view to improving Egypt's capability to provide farmers with productivity-increasing technologies in a supportive policy environment."

c. Subparagraph 3(C)(2) is deleted in its entirety.

d. Paragraph 3(D) is deleted in its entirety.

e. Paragraph 3(F) is amended by (1) changing the title of the paragraph to "Conditions Precedent to Disbursement for Commodities and Motor Vehicles"; (2) making the present paragraph subparagraph (1); and (3) adding the following subparagraph:

"(2) Prior to any disbursement for motor vehicles or the issuance by AID of documents pursuant to which disbursement will be made for motor vehicles, with the exception of the motor vehicles already on order as of the date of this Agreement, the GOE shall, except as the parties otherwise agree in writing, furnish to AID in form and substance satisfactory to AID, evidence that whatever governmental action is necessary in order to obtain full exemption from import restrictions, duties, taxes or other similar impositions for all project-financed motor vehicles has been taken."

f. Paragraph 3(H) is amended by (1) renumbering the paragraph as paragraph 3(I); (2) renumbering subparagraph (6) as subparagraph (5); and (3) adding to the end thereof the following additional covenants:

"(6) The Grantee shall, except as the parties may otherwise agree in writing, furnish to A.I.D. in form and substance satisfactory to AID, prior to the beginning of the Grantee's fiscal year each year of the Project, annual implementation and financial plans for each of the Project components;

(7) The Grantee shall ensure that for the life of the Project that the use of the experimental lands which are upgraded under the Project is restricted to agricultural research;

(8) The Grantee shall make a concerted effort to involve the private sector in agricultural research, seed technology, technology transfer and policy analysis formulation activities, in addition to the private sector involvement contemplated under the Project; and

(9) The Grantee shall annually increase its cash contributions in support of the Project's recurrent costs so that by the PACD and beyond, the implementing agencies', the Agricultural Research Center and the Undersecretariat for Agricultural Economics and Statistics, Chapter II (BAB II) allotments from the GOE including funds from the Special Account will meet all Project recurrent cost needs."

510

g. A new paragraph 3(H) is added as follows:

(H) Conditions Precedent to Disbursement for Technology Transfer, Seed Technology, Policy Analysis and New Initiatives/Project Management Components

Prior to any disbursement or the issuance by AID of any documentation pursuant to which any disbursement will be made for the technology transfer, seed technology, policy analysis or new initiatives/project management components, the GOE shall, except as the parties may otherwise agree in writing, furnish to AID, in form and substance satisfactory to AID:

(1) a statement of the names of the individuals who will be responsible for implementation of each of the four components, together with a statement regarding their designated duties and authorities; and

(2) evidence that the Grantee has appointed a counterpart for each long-term technical assistance advisor."

h. Based on the justification provided in the Project Paper, I hereby waive the requirement of full and open competition to permit an increase in the scope of work and the value of the host country technical assistance contract between the Consortium for International Development and the Ministry of Agriculture, and to extend said contract to September 30, 1994.

511

i. Based on the justification provided in the Project Paper, I hereby approve a waiver from AID Geographic Code 000 to Code 935 to permit local procurement of imported shelf items in an amount not to exceed $10,000,000 and to increase the per unit imported shelf item price limit to $10,000. By my signature below, I certify that exclusion of procurement from Free World countries other than Egypt and countries included in Code 941 would seriously impede attainment of U.S. foreign policy objectives and objectives of the foreign assistance program.

2. The authorization cited above remains in force except as amended hereby.

Marshall D. Brown
Director, USAID/Egypt

Date

Clearances:

OD/AGR/ACE, SHaynes (draft)
AD/AGR, EStains (draft)
(A)AD/PDS, VMolldrem (draft)
FM/FA, HPangan
PDS/PS, PDowns (draft)

DRAFTED: MSWard:mf:7/21/88:NARPAUTH

# TECHNICAL ANALYSIS

The purpose of this analysis is to determine whether the proposed project design is technically consistent with the known professional body of knowledge about solutions to the fundamental problem: the lack of productivity-increasing technologies generated by research and used by farmers. Since the nature of the proposed project's research, technology transfer, and policy analysis components is significantly different, though interrelated, these components will be analyzed separately.

The component analyses focus on the options, their strengths and weaknesses, and why the selection was made. These analyses conclude that the options selected are technically the most suitable and that, based on AID experience, it is possible to implement the project in the form proposed.

## A. Research

The research component of NARP has been operational since its approval in September 1985. For purposes of this Amendment, the Project Committee discussed three basic options, recognizing that option 3 below is being implemented, to generate more Egypt-specific technology:

(1) to strengthen only Egyptian research institutions;
(2) to strengthen only U.S. and international research institutions; and
(3) to strengthen Egytian institutions while encouraging linkages with non-Egyptian research institutions.

Like its predecessor, the Project designers recognized that increasing agricultural productivity in Egypt requires a continuous flow of improved technologies which are appropriate for the various agroclimatic zones and farming systems. Moreover, it has been AID's experience around the world that the desired flow of improved technology can best be achieved by indigenous national agricultural research systems at the host country level and that international research institutions can provide very useful assistance to national research systems. USAID/Cairo's support for agricultural research has been to strengthen the national research system while at the same time encouraging linkages with international research entities such as the International Agricultural Research Centers (IARCs). This was based on the realization that no research institution can be fully self-sufficient and that international agricultural research organizations have had a positive impact on investment in national research programs for various crops. The latter has been documented in CGIAR Study Paper #22. This, plus the lessons learned from AID's program evaluation ("Strengthening the Agricultural Research Capacity of LDC's: Lessons from AID Experience" - AID

# TECHNICAL ANALYSIS

The purpose of this analysis is to determine whether the proposed project design is technically consistent with the known professional body of knowledge about solutions to the fundamental problem: the lack of productivity-increasing technologies generated by research and used by farmers. Since the nature of the proposed project's research, technology transfer, and policy analysis components is significantly different, though interrelated, these components will be analyzed separately.

The component analyses focus on the options, their strengths and weaknesses, and why the selection was made. These analyses conclude that the options selected are technically the most suitable and that, based on AID experience, it is possible to implement the project in the form proposed.

## A. Research

The research component of NARP has been operational since its approval in September 1985. For purposes of this Amendment, the Project Committee discussed three basic options, recognizing that option 3 below is being implemented, to generate more Egypt-specific technology:

(1) to strengthen only Egyptian research institutions;
(2) to strengthen only U.S. and international research institutions; and
(3) to strengthen Egytian institutions while encouraging linkages with non-Egyptian research institutions.

Like its predecessor, the Project designers recognized that increasing agricultural productivity in Egypt requires a continuous flow of improved technologies which are appropriate for the various agroclimatic zones and farming systems. Moreover, it has been AID's experience around the world that the desired flow of improved technology can best be achieved by indigenous national agricultural research systems at the host country level and that international research institutions can provide very useful assistance to national research systems. USAID/Cairo's support for agricultural research has been to strengthen the national research system while at the same time encouraging linkages with international research entities such as the International Agricultural Research Centers (IARCs). This was based on the realization that no research institution can be fully self-sufficient and that international agricultural research organizations have had a positive impact on investment in national research programs for various crops. The latter has been documented in CGIAR Study Paper #22. This, plus the lessons learned from AID's program evaluation ("Strengthening the Agricultural Research Capacity of LDC's: Lessons from AID Experience" - AID

Program Evaluation Report #10) made the choice of where to focus strengthening efforts clearly on option 3 above. Options 1 and 2 were dropped because they were in conflict with lessons learned and Egyptian experience.

The last 10 years of USAID agricultural research experience in Egypt suggests that the ARC should continue to focus on adaptive research to ensure that scarce financial and capital resources are utilized as effectively and efficiently as possible in overcoming problems facing farmers and in achieving national food production and other agricultural sector goals. Experience further suggests that agricultural research in Egypt will benefit greatly from on-farm research trials which afford close association with the farmer and his knowledge of his problems. Research planned and carried out exclusively at experiment stations without contact with farmers was found often to be inappropriate.

The challenge facing the ARC, its 13 institutes, and 31 research stations is how to ensure that their research is relevant and useful to farmers and will be adopted by them. Crop yields obtained at research stations are, in general, much higher than those obtained by farmers growing the same crops in the same general agroclimatic zones. This indicates that information is not reaching farmers, or if it does, that some deficiency exists in the research process for meeting the specific needs of farmers.

By the very nature of interdisciplinary/on-farm testing and feedback mechanisms which characterize the research approach being funded under this component, there is greater assurance of a pay-off from resources allocated to agricultural research carried out within this project. In short, using the on-farm/interdisciplinary approach raises research scientists productivity in terms of the relevancy of the findings he or she generates.

This approach to increasing agricultural productivity is also a valuable tool for advancing the equity concerns of agricultural development. Unless there is broad, equitable participation in the process of increasing agricultural production, food self-sufficiency must include small farmers in the process so that their outputs and incomes are both increased.

One way to enhance the opportunities for small farmer participation is to organize the research system so that it generates new production technologies that fit the farmers resource base, e.g. high-yielding, low-cost minimum use of inputs and minimum risk. The agricultural research approaches used within the ARC will help focus agricultural research in directions such as these which offer the greatest opportunity for small farmer adoption.



515

On the institutional side, the GOE has given the ARC the legal responsiblity for agricultural research, provided staff and other resources to ARC and has solicited assistance from a wide range of donors, including USAID, to help strengthen the ARC. The only other significant body conducting agricultural research in Egypt is in the agricultural universities. They will be involved in the project and in technology creation and transfer in a number of ways. There are private sector firms that do some research as it relates to their commercial interests. And there are other research institutes that have limited involvement in agricultural research (see Administrative Analysis, Annex k). These institutes and private firms resources devoted to agricultural research are very limited in scope but will be involved in the overall research effort to the extent of their interests.

In summary, analysis concludes that the research components's focus on institution building; coordination, and support services in combination with existing and proposed research facilities, equipment, better trained manpower, and financial resources will foster an environment conducive to cultivating directly linked farmer research in Egypt. The prudent use of project funds to mobilize local physical and human research resources to address farmers production constraints will enhance the chances of a good yield of relevant and timely research findings easily transferable to the target farmers. Hence, the conclusion is that the component is technically feasible.

B. Technology Transfer

If the results of research are to be adopted by farmers, two-way communications between researchers and farmers must be established and maintained. Farmers in Egypt will find and use appropriate, new technology from whoever is offering it including the public extension service. Given past shortcoming in performance, doubt has been raised about whether or not the Egyptian public sector extension service can be relied upon to deliver research results to farmers and whether an alternative extension vehicle should be sought and or developed by the project.

In developing the technology transfer component, the Project designers followed the Executive Committee guidance which called for a two-prong technology transfer approach (strengthening both the public and non-public extension services). The intent was to identify complimentary efforts that show promise in promoting technology transfer in agiculture. The two-prong approach involves increased use of non-public extension services institutions (universities, other public sector agencies, mass-media, PVO's, private sector channels, cooperatives, etc.) and selective interventions to improve the effectiveness of the public extension service. To improve the delivery of new technologies, the Project Committee considered three options:

1. Commodity/Program Specific Extension

USAID has experience in Egypt with this approach through the Small Farmer Production, Major Cereals, Rice, Agricultural Mechanization, and other vertical projects. The advantage of this approach is that it can show impressive results for the specific commodity or program, at least over the short run or project duration. However, this approach does not build and internalize the extension function into an infrastructure which is to serve a broad range of farmers' needs or even to continue serving the specific commodity/program after the project is completed. The rice project in Egypt is a good example of this happening. Since these types of projects often pull resources from the extension infrastructure (as was done in Egypt) to focus on their specific programs with special incentives and resources available, the overall result can be a disintegration of the overall extension function. There is clear evidence this happened in Egypt.

2. Focusing on Selected Elements of the Technology Transfer System

This involves identifying a specific element or elements of the system—such as communication support units, private sector organizations, universities, public extension service, or research experiment stations—and only strengthening the capability of selected elements - not the whole system. The advantage of this approach is that it is focused, the institutional framework is easy to cope with, and the inputs/outpus can be fairly easily measured and monitored. Through the years, USAID and other donors have concentrated on this approach. The Gerald Britain, AID/PPC/CDIE review ("Innovative Approaches to Agricultural Extension: An Overview of AID Experience") and many others have shown this piecemeal approach has not been cost effective nor has it produced effective technology transfer over the long term. The results, for the most part, have been to fragment the technology process which at best has resulted in ineffective technology transfer programs and at worst retarded the adoption of new practices by farmers. A common example of what this approach produces is a situation where radio broadcasts (supported through USAID) recommend fertilizer blend A; the extension service (supported by the World Bank) is recommending fertilizer blend B; and the private sector dealers have for sale blend C.

3. Support for the Total Technology Transfer System

The purpose of the extension function is to establish effective links between researchers and farmers. Information dissemination and utilization research world-wide has clearly shown that technology transfer is a complex process involving many activities by many groups. Effective technology transfer occurs through a complex system. Information flows two ways through this system between farmers and reserachers. Studies have shown that information flows through intermediary groups whose primary responsibility is not extension. Examples include seed corn dealers



517

answering farmers' questions related to planting rates, loan officers at the cooperative bank discussing with farmers farm management questions and cropping alternatives, etc.

Looking at the extension function, in systems terms, reflects what is happening in countries that have successful technology transfer—United States, Taiwan, Australia, etc. These countries have found the means to encourage a wide range of organizations to become involved in the total technology transfer system and established the means (communication support, training, research field days, etc.) to use this system to facilitate the transfer of information and increase the impact of their research and extension organizations on farmers adopting new technology. For example, an analysis of how a successful county extension agent in the U.S. does his work reveals a significant amount of his time is spent working with agribusinesses, banks, farmers' organizations, marketing cooperatives, local service groups, mass media, and many others in addition to direct contact with farmers—these other groups help him get information to farmers.

The disadvantages of this approach are: (1) the system is not easily understood by both donors and government officials who are not familiar with the research findings (or how to put them into practice) of diffusion and other technology transfer studies; (2) this approach is not the normal way government bureaucrats build empires; (3) the institutional framework required for this approach is complex and difficult to administer, and it takes a long time to get into place before it can become fully effective; (4) the approach is difficult to evaluate in terms of impact on farmers; and (5) it involves a combination of changing thinking/attitudes of the major actors (such as the willingness of private sector companies or PVOs to work with government officials), and building institutional capabilities in widely varying types of orgainzations (physical and social science research institutes, educational, companies, PVOs, communications units, etc.).

The goal is to build an effective extension function within the Egyptian agricultural sector. The analysis concludes, over the long term, the only viable extension approach that will work is the systems approach. This has been confirmed and supported in the AID Administer's cable of 11 June 1985. This component identifies several complimentary activities that include various combinations of (1) non-public extension services agencies and (2) selective intervention to increase the effectiveness of the public extension. Moreover, it believes this component is technically sound and feasible.

C. <u>Policy Analysis</u>

The Agricultural Policy Analysis Component of NARP is to assist the MALR in strengthening its capabilities in performing

policy analysis, developing alternative strategies and evaluate the impacts of the current agricultural reforms being implemented by the GOE. For the purpose of this amendment the project committee recognized that there where two basic options to strengthening policy analysis in the MALR:

1. to strengthen the Agricultural Economics Research Institute which is a semi-autonomous agency, and;
2. to strengthen the Undersecretariat of Agricultural Economics and Statistics (U/AES).

The second option was chosen because the U/AES is the official undersecretary responsible for: (1) responding officially to ministerial request concerning policy issues, (2) the monitoring and evaluation of policies and programs for the agricultural sector, (3) the collection of official statistics for the agricultural sector, and (4) is directly involved in the policy formulation process and policy negotiations with other donors. It has been AID's experience that effective policy formulation is best done by those institutions involved with policy analysis and formulation with the utilization of external resources when needed. Therefore, the U/AES was decided to be the best institution for the implementation of this component.

A team of technical experts from USDA were employed to assist the GOE and Project Committee design this component. In this process it became obvious only 1 option was viable: strengthening the capability of the Ministry of Agriculture to identify, assess, and evaluate policy issues related to the agricultural activities being implemented by the GOE. This option can be best satisfied by implementing the combined set of activities described in the component.

1. Strengthening Economic and Policy Analysis Function

The component element to strengthen the policy analysis capabilities and monitoring of the policy reforms and studies are not expected to encounter technical problems in implementation, since both build on a base of familiar prior activities within the participating organization. Furthermore, an appropriate mix of technical assistance, training and commodity inputs including computers will be provided to insure technical feasibility of the activities.

The methodology being proposed for the monitoring of policy reform indicators, and the policy analysis areas will center on an analytical process of using sample surveys, statistical based supply and demand trend models, crop enterprise budgets and simple mathematical programs to address priority economic and policy issues. None of the expected outputs are based on advanced technical or methodological "state of the arts" which exceed the

U/AES staff capabilities. For example, farm and sectoral level analysis based on the utilization of crop budgets, L.P. models, acreage and yield response equations, and commodity and food balance sheets are being planned which can be utilized on P.C. computers. The data base needs, statistical programs, and analytical and modeling capability being considered are based upon practical considerations of what is manageable and obtainable in the Egyptian context. Furthermore, the type of processes and programs being envisioned have been successfully carried out in a number of other countries with assistance from USAID, USDA, and U.S. Universities and private sector firms. The availability of manpower and other technical resources needed to strengthen the analytical computers of the U/AES policy analysis staff is not expected to create a problem.

2. Policy Studies

The economic and policy studies to be implemented by the U/AES policy steering committee will not be of greater scope than those undertaken through previous projects such as the DCA or ADS. The studies will be better focused and designed to address specific policy questions and information needs by policy decisionmakers. The program is not expected to encounter technical difficulties for the following reasons. First, the technical advisors (both long and short term) provided for under this component will play an active role in assisting the institutions or firms involved to developed methodologies for data analysis and presentation. Second, each study will require a scope of work that will be approved by the policy analysis steering committee and an award base on competitive procedures in which the firm selected will have to demonstrate their capability to carry out and complete the study. Third, the analytical work is to be carried out by a broad range of Egyptian institutions or firms. This approach avoids the technical problems that commonly arise when a single institution is asked to increase its workload rapidly to meet information needs.

3. Statistical Analysis and Data Processing Improvements

The statistical and data processing functions will focus on methodologies and procedures dealing with the establishment of national list sampling frames (LSF), objective yield forcast models, developing surveys for census estimates, and developing surveys to collect data for establishing cost of production estimates. The LSF and objective yield models have been developed and tested on a pilot basis under a previou project DCA and will be expanded to a national level. The LSF are utilized in many countries as a means for establishing a population base for sampling to be used to estimate national figures. The methodology is well developed and has been proven to be completely applicable to developing countries conditions. The objective yield models have been developed on a pilot basis and need to be expanded to the national level. The USDA

team that has assisted in the development of this component examined the availability of information and manpower required to expand and develop national sampling list frames and objective yield forcast models as well as other basic information required to establish and operationalize the sampling methodology for census estimation.

The availability of manpower and other resources required to implement the system is not expected to create a problem since the LSF, objective yield forcast models and cost of production surveys have been started on a pilot basis. The project makes provisions to encourage that the traditional system remains functional while the new system based on sampling procedures is phased in and that adequate training and supervision of personnel will be carried out. The technology proposed for the tabulation, processing and analysis of statistical information will be on the NCR mainframe computer and utilizing standard commercial software packages to process the statistical data. This technology can be easily transferred by the technical assistance team through in-country and short-term training.

The overall conclusion of the technical analysis completed for the Agricultural Policy Analysis Component is that the activities proposed for component funding do not present any serious technical problems and should be fully implementable as planned in the Egyptian context. In each case, this conclusion is based on a thorough analysis of the current situation, including the technical capacity of the proposed implementing agency and an examination of the technical aspects of the activities being proposed by the AGR/ACE office and external technical consultants in the design efforts.

# VEHICLE PROCUREMENT JUSTIFICATION

## Subject:

Justification: Project Funded Vehicle Procurement

## Requirements:

M.O. 5-8 requires that all proposed project-funded vehicle procurements be approved by IS/CMT in the project planning stage.

The National Agricultural Research Project (NARP) USAID Project No. 263-0152 requires procurement from U.S. sources of the following vehicles:

## Quantity, Type and Price by Project Component:

### 1. Research Component:

A "Vehicle by Location and Type" matrix is attached. The plan calls for the purchase of fifty one (51) mini-vans, twenty three (23) regular vans, twenty two (22) buses, thirty four (34) utility vehicles (2WD), fifty eight (58) utility vehicles (4WD), sixteen (16) small pickup trucks, forty four (44) regular pickup trucks, twenty six (26)-one (1) ton trucks, twenty five (25)-two and half (2.5) ton trucks, and three hundred and six (306) motorcycles. The total

estimated cost plus twenty five percent (25%) spare parts and shipping equals $7.2 million.

On-Farm Research:

This activity calls for eighteen (18) double cabin pickup trucks and two hundred and thirty eight (238) motorcycles for a total of $0.7 million including spare parts and shipping.

2. Technology Transfer Component

This component calls for sixty five (65) utility type vehicles budgeted at an average cost of $23,000 and two thousand five hundred and sixty five (2565) motorcycles budgeted at $1,600 each. The total dollar value including shipping and spare parts is $5.6 million.

3. Policy Analysis Component:

This component calls for ten (10) pickup trucks, thirty (30) vans and one hundred and seventy (170) motorcycles with side car. The total dollar value including shipping and spare parts is $1.2 million.

4. Seeds Technology:

No vehicles required for this component.

5. New Initiatives Component:

No vehicles required for this component.

Vehicle Type Justification:

The type of vehicles to be procured and utilized in NARP are as follows:

| | | | | | |
|---|---|---|---|---|---|
| 1. | Vans | Mini | 6-8 | Passenger | |
| | Vans | Regular | 12-15 | Passenger | |
| 2. | Bus | School | 30-40 | Passenger | |
| 3. | Utility | 2WD | 5 | Passenger | 4-door |
| | Utility | 4WD | 5 | Passenger | 4-door |
| 4. | Truck | Small | Pickup, | Regular Bed | |
| | Truck | Sm. Club Cab | Pickup, | Regular Bed | |
| | Truck | Regular | Pickup, | Regular Bed | |
| | Truck | 1 Ton | Pickup, | Regular Bed | |
| | Truck | 2.5 Ton | Pickup, | Regular Bed | |
| 5. | Motorcycle | | 125cc minimum | | |
| | Motorcycle | | with side car | | |

No sedans are being requested for this project. All vehicles being requested will be large enough to carry passengers as required need. Vehicles specifications require heavy duty options be included for each vehicle requested. Vehicles requested will be sturdy enough to operate on poorly paved and maintained roads in urban areas and unpaved or rough roads in the rural areas of Egypt, where researchers, extension personnel and data collection activities are conducted and physically located.

Proposed Use - By Project Component

Vehicle procurement for all components is based on need assessments prepared in cooperation with personnel from the MALR, members of the CID technical assistance team in the case of the research and technology transfer components, members of a design team composed of USDA, USAID, and U/AES staff in the case of policy analysis component. The needs assessments are based on future work disposition. The assessment included:

1. A review of the MALR five year plan and operating unit plans as a basis to determine present and future work requirements;

2. A review of perceived needs for vehicles in relation to future needs was done by interviewing management and research managers at all levels; and

3. An inventory of vehicles for all ARC and other operating units by location, use, and disposition was utilized. This inventory is being updated, and will be computerized. This inventory will be maintained and kept on record at the ARC for review upon request.

Research Component:

Vehicles are required for the Central Administration, all fourteen (14) institutes, three (3) central labs, and thirty one (31) research stations within the Agriculture Research Center (ARC). The utility vehicles, vans, motorcycles, and trucks will be utilized by the ARC to transport research and administrative staff and materials back and forth to the research fields, the thirty one (31) research centers and the MALR headquarters as required to accomplish research

objectives. The buses will be used by the ARC to transport research staff and visitors back and forth to the research centers, training sites and demonstration fields as required.

Technology Transfer Component:

Vehicles are required by the major operating units of the ARC/EAD and the twenty (20) governorates who will have major implementation responsibility for this component of NARP. The offices within the ARC/EAD are: CAAES, CASE, AND AERDRI. The vehicles will be utilized by ARC/EAD staff and the governorate staff and councils to perform project and ARC related technology transfer and administrative functions. This will include travelling back and forth to the field to work with farmers, extension and ARC research staff.

Policy Analysis Component:

Vehicles are required by the U/AES and its department to collect agricultural data necessary to perform policy analysis and related statistical and economic services. This will include travelling back and forth to the field operations to collect the required data and also perform the necessary administrative functions for this component.

Seed Technology:

No vehicles required.

New Initiatatives:

No vehicles required.

Maintenance:

The ARC/AMRI is proposing the establishment of a Central Service Unit (CSU) as part of NARP at its headquarters. The

five existing ARC machinery repair, shops, established under the EMCIP project, at Sakha, Gemmiza, Shandaweel, and one in Dokki will be placed under CSU control.

The plan calls for the CSU to utilize sound business practices in its operations, hence it is proposed that ARC enter into specific period contracts with selected well qualified private firms to manage and provide day to day repair and maintenance service at each of the five CSU service shop locations. Under the CSU plan, CSU staff will be supervising the contractors operations and work being inventory at Dokki and the four sub-service locations to provide parts to service contractors.

$5.5 million dollars has been budgeted for this maintenance activity. Two/three months after the plan is approved a team of maintenance experts (local and/or expatriate) will assist AMRI in developing a detailed proposal for the CSU. This proposal will be reviewed by the MALR and USAID and a course of action determined. The ARC maintenance facilities currently in place are sufficient to handle maintenance in the short run. Lack of adequately trained and experienced staff continues to be a chronic problem with the ARC's operation and hence the quality of service is not entirely satisfactory. The proposed maintenance plan hopes to address this problem.

Disk No. 33, Doc. ANNEXG, SK

# ADMINISTRATIVE ANALYSIS

The National Agricultural Research Project (NARP) Paper Amendment proposes to create more, productivity-increasing technologies and farmer adoption of these technologies. The amended project will increase the present, limited quality and quantity of institutional capabilities for Agricultural Research, Technology Transfer, and Policy Analysis. This Administrative Analysis is designed to assess the capacity of the implementing agencies with regard to functions considered critical to successful implementation of the Project. It is also intended to assess the adequacy of proposed implementation arrangements, given the relative administrative constraints of the involved Government of Egypt (GOE) agencies.

## I. Project Implementing Agencies

Research: The only Egyptian institution whose research is exclusively devoted to agriculture is the Agricultural Research Center (ARC). Agricultural Research is also conducted by Egyptian universities, Academy of Scientific Research and Technology, National Research Center, Desert Development Center, Water Irrigation Research Center, and a few agribusinesses. Since the ARC is Egypt's largest and primary agricultural research institution, the implementing agency for the research project component will be the ARC.

Technology Transfer: Presently in Egypt, agricultural technology is transferred from researchers to farmers primarily by public sector entities including banks, cooperatives, agricultural university faculties, and the MALR extension service, and secondarily by the private sector (e.g. processing and input distribution firms, mass media, PVOs, and organized farmer groups and their leaders). The private sector has no organized institutional structure which is devoted exclusively to private sector technology transfer. The public sector's institutional structure for technology transfer primarily involves two organizations within the MALR. The ARC has the Extension Affairs Division (EAD), and under the supervision of the Minister, there is the Central Administration for Agricultural Extension Services (CAAES) which is the public extension service. These organizations assist other public and private agencies in conducting technology transfer in Egypt.

It is the intent of the MALR to put the CAAES under the supervision of the ARC. This transfer is expected momentarily. This will put Egypt's primary technology transfer units under the ARC Director who will be in a position to administer integrated public sector research and extension efforts and to coordinate with private sector technology transfer efforts. Therefore, the implementing agency for the technology transfer component will be the ARC.

Policy Analysis: Through the AID Data Collection and Analysis (DCA) Project and the Agricultural Development Systems (ADS) Project, USAID/Cairo has had prior project experience with both the ARC's Agricultural Economic Research Institute (AERI) and the MALR's Undersecretariat for Agricultural Economics and Statistics (U/AES). Both agencies were capable of successfully

implementing these AID projects. Their management, financial, and contracting capabilities were not constraints in implementing AID projects. Since U/AES is the GOE agency responsible for addressing ministerial questions concerning agricultural policy issues, monitoring of policy reforms, developing policy alternatives, and participating in policy negotiations for the GOE, while AERI has only the responsibility of performing medium and long term research studies in the areas of economic assessments, marketing, supply response, and demand analysis, the policy analysis component will be implemented by the MALR's U/AES.

## II. Elements of Analysis

### A. Overview of the Agricultural Research Center (ARC)

#### 1. ARC's Mandate

The ARC, a semi-autonomous organization, is the largest and most important of several Egyptian organizations working in agricultural research and extension. It was established by law as a research and extension institution and has corporate status under the jurisdiction of the Ministry of Agriculture. The objective of ARC is to increase agricultural production in conformity with the national development plan for the agricultural sector. The Center has the following mandated terms of reference:

a. To establish and execute agricultural research and extension programs by conducting research and demonstration tests, studies, and analyses in the areas of crops, livestock, fisheries, soil and water, crop and animal protection, agricultural engineering, and agricultural economics;

b. To establish and implement policies for introducing and multiplying new, improved crop varieties and to produce principal and registered seeds;

c. To supervise management of the Center's research stations and plantations;

d. To maintain close relations with external organizations (both domestic and international) concerned with agricultural production;

e. To publish and circulate agricultural research findings and the Center's quality standards for agricultural inputs;

f. To establish agricultural extension and training programs;

g. To participate in determining general agricultural policies aimed at increasing productions; and

h. To propose new legislation for the implementation of agricultural policies.

The ARC organization consists of a Board of Directors, a Secretary for Administrative and Financial Affairs, and 3 operational affairs divisions in the areas of research, extension, and production farms. (Chart 1 shows the organizational structure of ARC). The Board of Directors includes the Minister of Agriculture (Chairman of Board), the Director of the ARC who is responsible for ARC's overall operations, three Deputy Directors (one each for Research, Extension, and Production Farms), the Directors of

the 13 Research Institutes, a representative of the Academy of Scientific Research and Technology, and five consultants versed in agriculture and selected by the Minister of Agriculture.
This Board is responsible for:

a. Assessing the needs and plan of the 13 Institutes;
b. Monitoring and evaluating the Institutes' research and recommendations;
c. Establishing and monitoring the role of the Institutes' agricultural extension services;
d. Establishing the required research facilities to include a library system;
e. Establishing and implementing a plan for the training and upgrading of the Institutes' personnel;
f. Establishing, coordinating, and regulating the policies of the Institutes' research plans;
g. Adopting rules and regulations governing the Center's technical, administrative, and financial affairs; and
h. Arranging for provision, investment, management and allocation of the Center's funds to include outside grants and donations and endorsing its budget and balance sheet.

2. ARC Research Affairs Division

The ARC research function is comprised of thirteen institutes and two central laboratories as described below. The research staff totals approximately 2,500 researchers and 4,500 research-related staff including 700 PhDs, 1,300 M.S., 3,000 B.S. and 2,000 non-college degree holders.

The research institutes and central laboratories of the ARC are described briefly as follows:

Cotton Research Institute (CRI): This is a large, well-established Institute, heavily oriented to breeding and has developed most cotton varieties grown in Egypt. The Technology Section conducts extensive evaluation tests on hybrids and new lines. Tests include fiber color, strength, and elongation, and various yarn characteristics.

Field Crop Research Institute (FCRI): This Institute conducts research on various field crops including maize, sorghum, wheat, barley, legumes, rice, oil-crops, fiber crops, forages, and onions. It also includes Seed Technology and Plant Physiology sections.

Sugar Research Institute (SRI): SRI concentrates on the breeding and testing of exotic sugar cane varieties with some agronomic research being conducted in Upper Egypt. SRI also conducts research on sugarbeets.

Horticultural Research Institute (HRI): HRI has the largest staff at ARC (over 3,000 persons). It has research sections working on citrus, grapes, tropical fruits, mineral nutrition, olives, cucurbits,

tomatoes, forestry, ornamental plants, potatoes, fruit handling, etc. Additionally, there are large Seed and Vegetable Seed Production sections.

Plant Pathology Research Institute (PPRI): This Institute consists of two main divisions, Field Crops Research and Horticultural and General Research. The former Division covers various diseases of field crops, cotton, and sugar-cane. The latter Division covers the broad groups of horticultural crops diseases and discipline oriented research, e.g., virus diseases, bacterial diseases, nematology, post-harvest diseases, mycology, disease survey, biological control, fungicides and seed pathology.

Plant Protection Research Institute (PPRI): This Institute is concerned with insect and weed control as well as bee and silkworm culture. The Institute consists of 20 sections. Some relate to specific problems such as cotton leafworm while other sections, such as the field crops and vegetable crops insect sections, are broad in scope.

Soil and Water Research Institute (SWRI): SWRI has two major divisions, Soil Research and Soil Technology, which address problems in soil physics, chemistry, soil survey and classification, microbiology, soil fertility, plant nutrition and water requirements, and saline and alkaline soils.

Animal Production Research Institute (APRI): APRI has 10 sections concerned with animal chemistry, microbiology, and nutrition for such animals as sheep, cattle, buffalo, rabbits, and poultry. The cattle and buffalo programs emphasize milk production and dairy technology rather than meat production.

Animal Reproduction Research Institute (ARRI): The ARRI has sections concerned with interfertility field investigations, e.g., biology of reproduction, pathology of reproduction, reproductive diseases, etc.

Animal Health Research Institute (AHRI): This Institute is primarily concerned with disease diagnosis and animal research with particular emphasis on vaccination for disease control.

Serums and Vaccines Research Institute (SVRI): While this Institute conducts some research, most of its activities involve the production of animal serums and vaccines for use in Egypt and other Arab countries.

Agricultural Economics Research Institute (AERI): This Institute is primarily responsible for long-term economic and policy-related studies, but also provides enumerators in the governorates for the national crop reporting surveys carried out by the MALR's Undersecretariat for Agricultural Economics.

Agricultural Mechanization Research Institute (AMRI): This institute develops farming equipment and methods for small Egyptian farms. It participates in land improvement and the design of farm machinery.

Central Pesticides Laboratory (CPL): This Laboratory analyzes pesticides, fertilizers and herbicides for purity and the efficiency of various materials. CPL coordinates its activities with both the Plant Protection and Plant Pathology Research Institutes.

Central Statistical Laboratory (CSL): The functions of CSL are experimental design, statistical analysis, development of arithmetic models for statistical analysis, and research in applied statistics.

In addition to the various institutes whose headquarters are located mostly in Cairo, the ARC has responsibility for 31 research stations located throughout Egypt. Twelve are animal production stations, six horticulture stations, and thirteen general agricultural research stations.

3. ARC Extension Affairs Division

The institutional structure for ARC Extension Affairs, as it is expected to be in the near future, involves the Agricultural Extension and Rural Development Research Institute (AERDRI), the Central Administration for Specialized Extension (CASE), and the Central Administration for Agricultural Extension Service (CAAES). The AERDRI conducts research on extension methods and farmer technology adoption practices, and collaborates with the Ministry of Public Works and Water Resources (PWWR) on irrigation technology transfer. The CASE has the responsibility of developing technical packages for farmers and for providing subject matter specialist to the CAAES's extension programs. These responsibilities will be carried out primarily at the ten research/extension centers. The CAAES is responsible for the decentralized governorate extension staff and programs, i.e., the CAAES is the public extension service. These three units are the primary organizations responsible for technology transfer in Egypt.

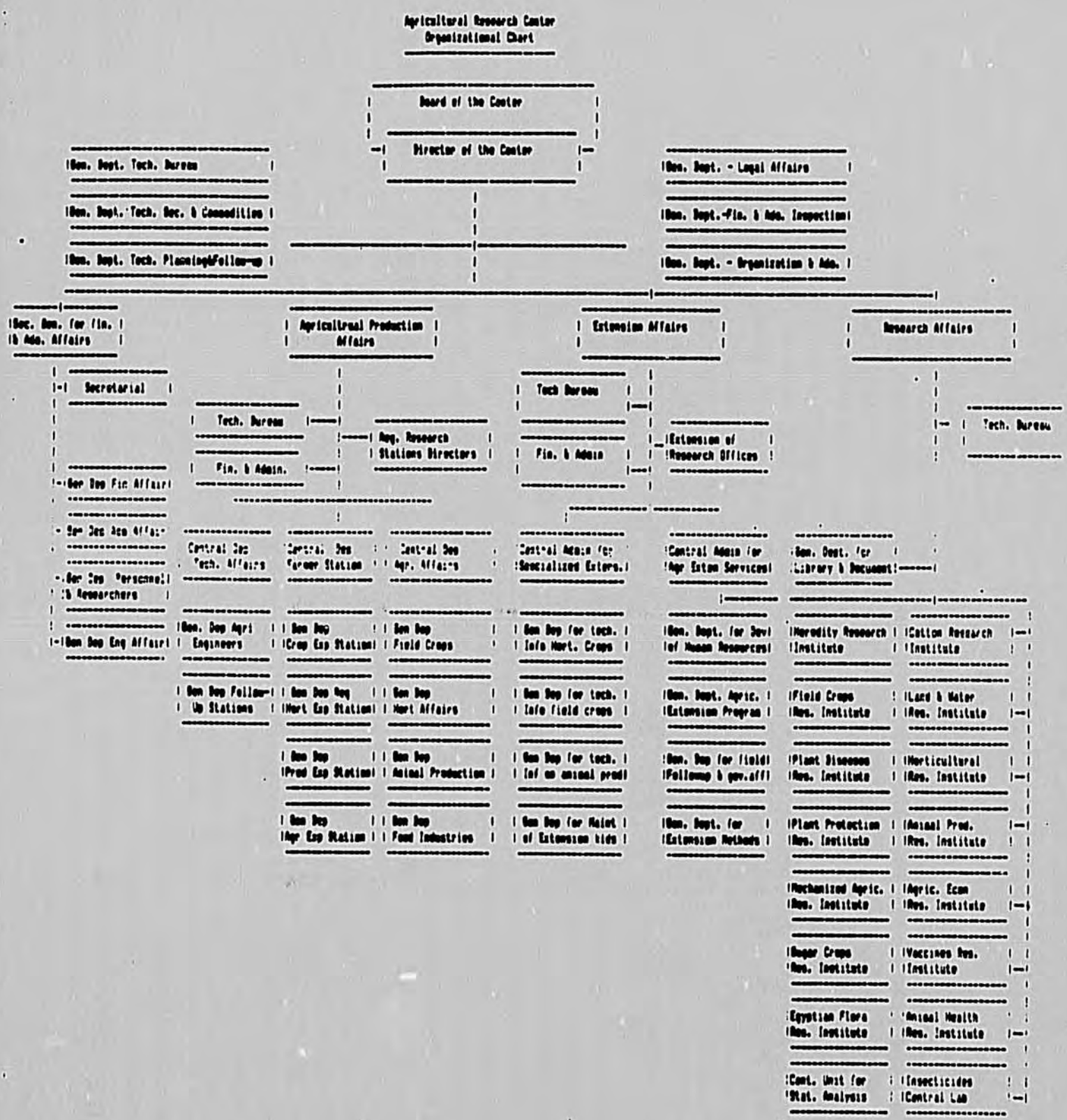
The mandate of ARC is described above. Its legal charter requires no amendment to accommodate the transfer of supervision of the CAAES from the Minister of Agriculture to the Director of ARC. The current legal status of the CAAES is as a general directorate within the Minister's Office of the Ministry of Agriculture.

4. ARC Organizational Structure

Chart 1 shows the organizational structure of ARC including the Extension Affairs Division as it was in 1983 (when CAAES's supervision was located there) and as it is expected to be again in the near future. When the CAAES is again under ARC leadership, then a Deputy Director for Extension will be appointed in each of the 13 research institutes and three central laboratories. In addition, ARC's ten research/extension centers will have deputies for extension. This staff, under the leadership of the ARC's Deputy Director for Extension Affairs, will implement the ARC regulation which requires each researcher to spend at least two days per week on extension activities. This should give substantial impetus to the involvement of

Chart I

Agricultural Research Center
Organizational Chart



subject matter specialists (SMSs) and other researchers in the public extension service.

Chart 2 shows the organizational structure of the CAAES. The CAAES organizational units listed under the Applied Extension Directorate are paralleled in each governorate headquarters and at each district headquarters. These governorate and district level staff are included in Table 1.

B. ARC Project Implementation Capabilities

1. Organization

Under the provisions of GOE Law No. 69 of 1973, the ARC was given corporate status under the jurisdiction of the Ministry of Agriculture. As a semi-autonomous organization, the ARC has its own budget and deals directly with the Ministry of Finance in the budgetary process. However, to commit funds, ARC needs the approval of the MALR's Undersecretariat for Finance and Administrative Affairs. ARC can disburse fund without MALR approval.

ARC's legal and financial status and its pattern of organization within the GOE/MALR have allowed ARC to successfully implement prior AID-financed projects, i.e., the Rice Research and Training Project (263-0027), the Agricultural Mechanization Project (263-0031), and the Major Cereals Improvement Systems (263-0070). In addition, ARC has successfully implemented projects financed by other donors, primarily the Canadian, German, Japanese, and Danish governments.

2. Contracting and Reporting

In May 1985, USAID/FM conducted a preliminary assessment of the ARC's contracting capability which is on file in the Agriculture Office. The assessment team reviewed the ARC's contracting capability from preparation of tender documents through negotiation of contracts. The results indicated that ARC contracts are negotiated with the advice and approval of a MALR/ARC committee chaired by an ARC representative. Moreover, the USAID's assessment team concluded that ARC, through its procurement and foreign affairs offices, has the capability for the preparation and negotiation of foreign contracts.

However, to perform a more in depth and up-to-date assessment and to include the MALR's contract management and reporting capabilities, USAID/FM has recently requested and received ARC approval to use project funds to establish an AID-direct contract with an Egyptian firm to appraise the ability of NARP's implementing agencies both the ARC and the U/AES to: a) advertise, negotiate and award contracts; b) monitor contract implementation; c) examine invoices; d) audit contractor records and reports; and e) budget, account, disburse and report on the use of AID funds advanced.

For the complete statement of work for this appraisal, please see Attachment 1 to this Analysis. If weaknesses are reported by this appraisal,

CHART 2

THE CENTRAL ADMINISTRATION FOR AGRICULTURAL EXTENSION SERVICES

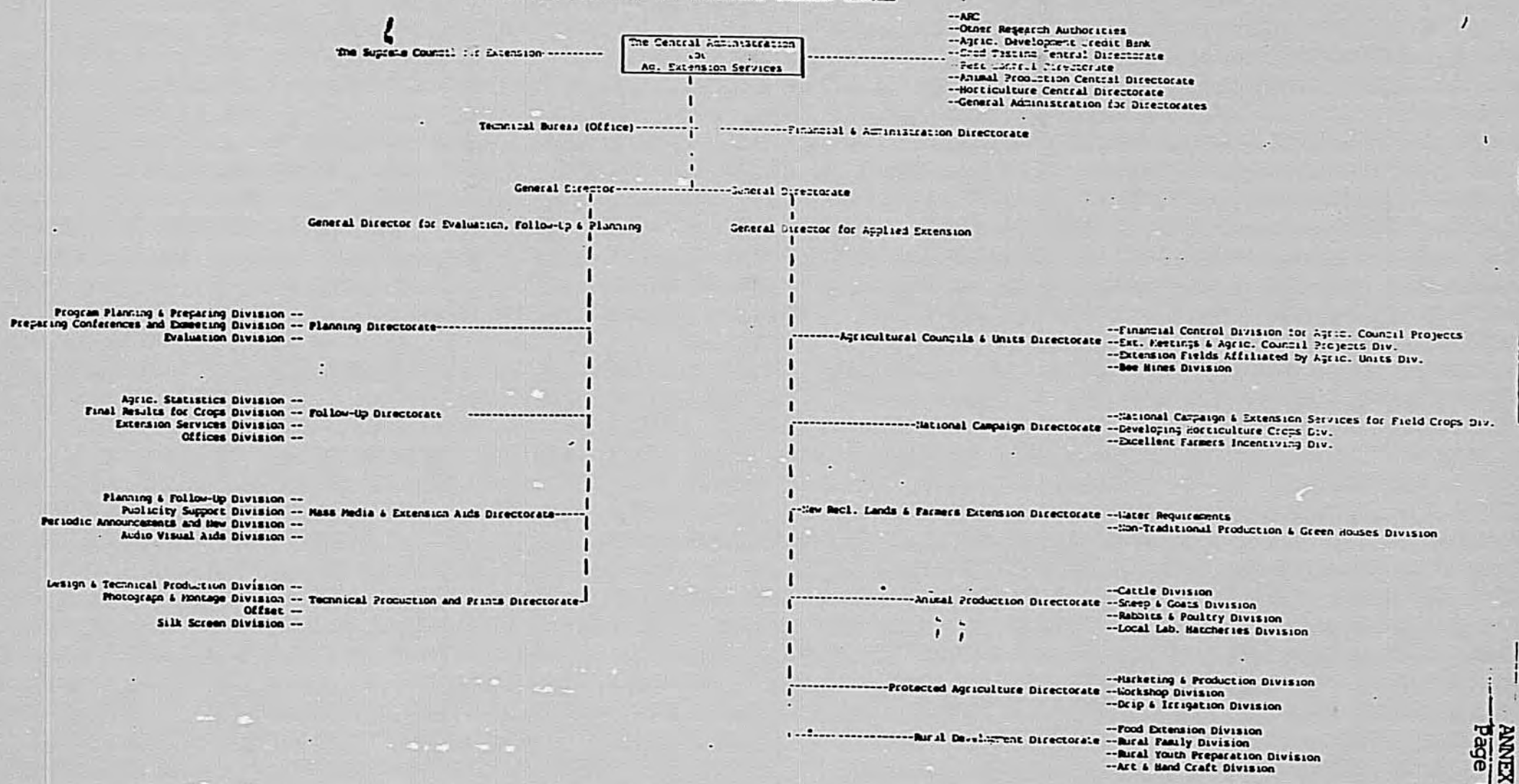


TABLE 1.

# AGRICULTURAL EXTENSION ADMINISTRATION FIELD STAFF, 1987

| No | Governorates | Governorate Level | | | | | | District Level | | | | | Village | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | DIR | SUP | DEP | AGM | AGF | SUP | SUP | DEP | AGM | AGF | SUP | AGT | |
| 1 | Cairo | 1 | 1 | 6 | 4 | 2 | 4 | 2 | 0 | 0 | 0 | 0 | 6 | 26 |
| 2 | Qualubia | 1 | 5 | 3 | 2 | 1 | 10 | 7 | 38 | 24 | 7 | 28 | 182 | 308 |
| 3 | Menoufia | 1 | 6 | 16 | 7 | 9 | 15 | 8 | 43 | 40 | 1 | 60 | 322 | 528 |
| 4 | Gharbia | 1 | 6 | 9 | 3 | 6 | 12 | 8 | 36 | 35 | 10 | 40 | 280 | 446 |
| 5 | Kafr El Shiek | 1 | 5 | 3 | 2 | 1 | 10 | 9 | 42 | 42 | 0 | 18 | 242 | 375 |
| 6 | Dakahlia | 1 | 6 | 14 | 6 | 8 | 30 | 12 | 57 | 50 | 0 | 60 | 360 | 604 |
| 7 | Sharkia | 1 | 6 | 22 | 11 | 11 | 25 | 14 | 67 | 58 | 2 | 40 | 450 | 707 |
| 8 | Ismailia | 1 | 6 | 12 | 8 | 4 | 30 | 5 | 6 | 6 | 0 | 36 | 41 | 175 |
| 9 | Port Said | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 14 | 17 |
| 10 | Suez | 1 | 1 | 1 | 1 | 0 | 5 | 1 | 1 | 1 | 0 | 5 | 7 | 24 |
| 11 | Damietta | 1 | 4 | 0 | 0 | 0 | 3 | 4 | 9 | 9 | 0 | 14 | 87 | 131 |
| 12 | El-Bhehira | 1 | 6 | 6 | 3 | 3 | 6 | 14 | 51 | 51 | 0 | 50 | 490 | 681 |
| 13 | Alexandria | 1 | 4 | 4 | 3 | 1 | 8 | 3 | 11 | 6 | 5 | 2 | 48 | 96 |
| 14 | Matrouh | 1 | 1 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 8 | 15 |
| 15 | New Valley | 1 | 2 | 2 | 1 | 1 | 2 | 5 | 2 | 2 | 0 | 0 | 28 | 46 |
| 16 | Giza | 1 | 6 | 14 | 6 | 8 | 17 | 7 | 0 | 0 | 0 | 6 | 52 | 117 |
| 17 | Fayoum | 1 | 6 | 4 | 3 | 1 | 20 | 5 | 24 | 20 | 0 | 20 | 160 | 264 |
| 18 | Beni Suef | 1 | 3 | 7 | 3 | 4 | 4 | 7 | 32 | 21 | 11 | 16 | 200 | 309 |
| 19 | El-Minia | 1 | 6 | 19 | 12 | 7 | 21 | 9 | 85 | 58 | 27 | 61 | 394 | 700 |
| 20 | Assuit | 1 | 6 | 25 | 12 | 13 | 22 | 11 | 60 | 60 | 0 | 42 | 600 | 852 |
| 21 | Sohag | 1 | 5 | 0 | 0 | 0 | 6 | 11 | 18 | 18 | 0 | 0 | 255 | 314 |
| 22 | Quena | 1 | 5 | 8 | 0 | 8 | 11 | 11 | 0 | 0 | 0 | 11 | 89 | 144 |
| 23 | Aswan | 1 | 2 | 1 | 0 | 1 | 7 | 4 | 7 | 7 | 0 | 10 | 73 | 113 |
| 24 | North Sinai | 1 | 2 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 6 | 13 |
| 25 | South Sinai | 1 | 1 | 1 | 0 | 1 | 8 | 4 | 0 | 0 | 0 | 8 | 4 | 28 |
| 26 | Red Sea | 1 | 2 | 1 | 0 | 1 | 2 | 4 | 0 | 0 | 0 | 4 | 5 | 20 |
| | Total | 26 | 104 | 178 | 87 | 91 | 298 | 175 | 589 | 508 | 63 | 531 | 4403 | 7053 |

KEY

DIR - Director
SUP - Supervisor
DEP - Deputy
AGM - Male Extension Workers
AGF - Female Extension Workers
SUP - Support Staff
AGT - Agent

coordination between USAID, MALR, and technical assistance teams will be made to remedy these weaknesses.

3. Management

a. Delegation of Authority

The delegation of responsibility to middle-level management is crucial for a rapid and effective response to continuously emerging organizational bottlenecks. This is especially required in an agricultural technology organization where particular actions are dictated by seasonal requirements, and the lack of a timely response delays implementation. The decentralization of decision-making authority can be partially effected by training and technical assistance, but it also requires a management decision to delegate more responsibilities to those closest to the source of the need. This characteristic of the Egyptian administrative system has the potential for causing delays in project implementation.

b. Experience and Capability of Managers

The ARC has emphasized the hiring and training of scientist and technical personnel. Most of the upper echelon staff reached their present positions via the technician route, i.e., via training as a plant breeder, soil scientist, etc. with promotions within ARC based largely on service time. Donor assistance, including USAID, has also stressed technical training instead of management training. Since ARC personnel are promoted largely on the basis of seniority, all ARC managers are older, with experience. The quality of that experience is uneven. The managerial expertise of the ARC at intermediate levels is often inadequate.

4. Staffing

The overall quantity of staff (24,000 employees) in the ARC is more than adequate for any conceivable level of program activity. However, people are not always assigned to the right places in the right numbers, and the level of technical competence required of ARC staff to carry out assignments is often uneven.

An extensive in- and out-of-country training programs are proposed in NARP to meet ARC's management and technical training needs which are identified in detail in Annexes O and Q.1. In addition to training in

necessary technical fields, emphasis will be given to courses in organization management with formal coursework in business and public administration. For training in the U.S., English language capability is expected to be a problem. A special English language program is being implemented under NARP and will be used to bring involved staff to the appropriate level of English competence.

5. Weakness

Most of the decision-making authority in ARC rests with its Director General who until very recently was not the NARP Project Director.

Since the signing of the NARP Grant Agreement in late 1985, implementation has been relatively slow in terms of project disbursements. A major reason for this slowness is that 14 months lapsed before the prime TA contract was signed. An added reason was a reluctance on the part of both ARC and USAID to spend money on inputs, e.g., training and commodities, until the technical assistance team had helped to develop work plans for the project's activities.

Experience with past AID-financed projects which were implemented by ARC has shown a need for establishing a project specific implementation unit for day-to-day project implementation and a high level steering committee for overall guidance and coordination.

6. Proposed Remedies

The NARP Project Director who is now the Director General of ARC has established an implementation unit called the NARP Executive Office. Under the amended project, this unit will prepare the annual financial and implementation plans for the research and technology transfer components. These plans will include (1) all activities to be funded during the year along with the required budgets and (2) annual objectives with indicators to measure progress towards meeting those objectives during the course of the year. To operate this unit, the Project Director is assisted by a resident advisor and qualified ARC personnel. The resident advisor serves as the Project Coordinator and is responsible for the design and implementation of a computer-based project monitoring system as well as preparing a plan for the introduction of micro computers into project operations. To assist the NARP Executive Office, the project has financed needed office equipment, e.g., micro computers and photocopiers. This Executive Office brings a focus to the implementation process and makes an identifiable group accountable for delays and other unresolved difficulties.

Since the Executive Office is no guarantee that the implementation will proceed without difficulties, the Ministry of Agriculture has established a NARP Steering or Coordinating Committee (CC) which is responsible for the following: (1) providing overall policy guidance, leadership,

and coordination; (2) approving annual work plans and budgets prepared and defended by each GOE Deputy or Component Director; and (3) reviewing progress of the individual components and assuring that the project is kept on schedule. The CC meets no less than quarterly to discuss NARP issues and to address implementation problems as reported by the Project Director who is the head of the NARP Executive Office.

The Committee membership currently includes: the Governor of Menufia (Chairman); the Director General of the ARC (the NARP Project Director); the Undersecretary for Financial and Administration Affairs; the Administrator of the Foreign Relations Department; and the Undersecretary for Economics and Statistics. This Committee meets as needed, but no less than monthly.

The Project Coordinating Committee mechanism assures high level GOE participation/control. The institutional development aspects of the project should receive adequate high-level attention. In the process, ARC officials will gain useful experience in the implementation of large projects.

ARC personnel will benefit greatly from those project components involving technical assistance and training. NARP was designed with ARC's institutional and human resource development in mind and includes specific inputs intended to relieve constraints inherent in ARC's current structure.

The research component's long-term and short-term TA needs are being met through two host country contracts and one AID-direct contract. These three contracts exclude procurement of commodities or the administration of training. These exclusions have proven burdensome for the project's managers. Therefore, it is proposed in the implementation of the technology transfer component to use a single host country contractor to provide the long- and short-term technical assistance, placement and administration of the out-of-country training, and procurement of off-shore commodities. Also, a short-term AID direct contractor will be used to help ARC in preparing the specifications and tender documents for the technology transfer component's single contractor.

7. Conclusion

Given the existing status of ARC, as discussed above, the establishment of the NARP Executive Office and the NARP Coordinating Committee, the research component's two-years of implementation experience, and the proposed use of a single contractor for the technology transfer component's TA, training, and commodities, the implementation of NARP by ARC is most likely to proceed as proposed in the implementation plan. In summary, it can be concluded that the organizational and implementation arrangements proposed for the amended project are reasonable and that the project is administratively feasible.

C. Overview of the Undersecretariat for Agricultural Economics and Statistics (U/AES)

1. U/AES Structure and Functions

The U/AES is a line agency of the Ministry of Agriculture and is responsible for agricultural statistics, macro-economic analysis, and it is concerned with agricultural sector and multisector issues. It has responsibility for design of policies and alternative strategies, monitoring and evaluating the impact of policy changes. The U/AES can perform this analysis itself or contract the analysis out to another institution, such as local universities, AERI or private firms. The U/AES is responsible for the official collection of agricultural statistics, and its processing and tabulation. There are 1,438 persons in the U/AES including its 37 field offices, including 1 Ph.D., 8 M.S., 25 Diploma, and 839 B.Sc. degree holders in Agriculture. Table 2 shows the staffing pattern of U/AES. The U/AES organization consists of six general departments plus a Technical Office, a Central Statistics Department, and a Financial and Administrative Affairs Department. (Chart 3 shows the organization structure of U/AES).

The following is a brief description of U/AES departments:

a. General Department for Agricultural Census is responsible for: (1) collecting data and periodical agricultural statistics in order to obtain precise data about all elements of the agricultural production, and (2) preparing necessary programs to implement the agricultural census, arranging and reviewing the census data, and making and evaluating studies related to these data. It consists of the following:

- Technical Affairs and Training Department.
- Field Survey and Classification Department.
- Editing, Analyses, and Publishing Department.
- Administrative Affair Section.

b. General Department for Agricultural Statistics is primarily responsible for producing data by observing and measuring a target area or subsector and for the upgrading of data by performing statistical analyses as part of the data interpretation and analysis process. This department includes: (1) the Agricultural Production Statistics Department, (2) the Cost of Production, Prices, and Wages Department, and (3) Administrative Affairs Section.

c. General Department for Statistical Estimation by Sampling is responsible for: (1) using data sampling techniques to determine the planting area and the production median for major field crops, fruits, and animal production estimates; (2) using sampling techniques to identify statistical relations and indications; (3) coordination between the Governorates Sampling Units and the General Department for Agricultural Statistics; (4) forecasting agricultural production using sampling techniques; and (5) using sampling techniques in estimating agricultural production inputs.

Table 2
Staffing Pattern of U/AES

| Description | Number |
|---|---|
| PhD (Director | 1 |
| MS Ag. Economists | 8 |
| Diploma Ag. and other | 25 |
| Ag. Engineer | 839 |
| Ass't Ag. Eng. | 244 |
| Admin and Finance | 49 |
| Clerks | 158 |
| Technicians | 11 |
| Laborers | 65 |
| Drivers | 48 |
| Total | 1,448 |

Source: AGR/A

CHART 3
UNDERSECRETARIAT FOR AGRICULTURAL ECONOMICS AND STATISTICS

**Undersecretary for Agricultural Economics and Statistics**

- Technical Office
- General Statistics Department
- Financial & Administrative Affairs Department

**General Dept. for Data Processing**

1. System Analyses Dept.
2. Programming Dept.
3. Training Dept.
4. Computer Operating Dept.
   a. Main Frame Operating Dept.
   b. Mini Computer Sectic
   c. Gov. Computers Operating Section
5. System Eng. Dept.
6. Administrative Affairs Section

**General Dept. for Economic Studies**

1. Dept. for Prod. Economics Studies
   a. Crop Structure Studies Section
   b. Field Crops and Horticulture Studies Section
   c. Animal Prod. and Aquaculture Studies Section
2. AGR Marketing Studies Dept.
   a. AGR Marketing Section
   b. Foreign Trade Section
3. AGR Policy Studies
   a. Current Status Studies Section
   b. Future Status Studies Section
   c. Special Studies Section
4. Resources Economics Studies Section
   a. Soil Economics Section
   b. Water Economics Section
5. Administrative Affairs Section

**General Dept. for Marketing Data**

1. Dept. of Demand Estimation for Production Inputs
2. Dept. of Marketing Data
3. Cooperative Marketing Dept.
4. Administrative Affairs Section

**General Dept. for Statistical Estimation by Sampling**

1. Statistical Design and Monitoring Dept.
   a. Statistical Design Section
   b. Experiment Implementation and Monitoring Section
2. Dept. of Statistics for Delta Governorates
3. Dept. of Statistics for Mid Egypt
4. Dept. of Statistics for Upper Egypt
5. Administrative Affairs Section

**General Dept. for Agricultural Statistics**

1. Agriculture Production Statistics Dept
   a. Vegetable and Fruits Statistics Section
   b. Field Crops Statistics Section
   c. Animal Production Statistics Section
   d. Meteorological Statistics Section
2. Cost of Production Prices and Wages Dept.
   a. Production Costs Statistics Section
   b. Price Statistics Section
   c. Labor Force and Wages Statistics Section
3. Administrative Affairs Section

**General Dept. for Agricultural Census**

1. Technical Affairs Training Dept.
   a. Technical Affairs Section
   b. Training Section
2. Field Survey and Classification Dept.
   a. Field Survey Section
   b. Classification Section
3. Editing, Analyses and Publishing Dept.
   a. Editing Section
   b. Analyses Section
   c. Publishing Section
3. Administrative Affairs Section

The General Department for Statistical Estimation by Sampling supervises the following departments:

- Statistical Design and Monitoring Department.
- Department of Statistics for Delta Governorates.
- Department of Statistics for Middle Egypt.
- Department of Statistics for Upper Egypt.
- Administrative Affairs Section.

d. General Department for Marketing collects data related to internal and external agricultural marketing, prepares financial budgets and monitors implementation of GOE agricultural marketing, and directs the specialized marketing cooperatives which market agricultural field crops, fruits, and vegetables. It has the following departments:

- Department of Demand Estimation of Production Inputs.
- Department of Marketing Data.
- Cooperative Marketing Department.
- Administrative Affairs Section.

e. General Department for Economic Studies is responsible for preparing the economic studies in the fields of resources and production economics, agricultural marketing and agricultural policies. This General Department consists of:

- Department for Production Economics Studies.
- Agricultural Marketing Studies Department.
- Agricultural Policy Studies Department.
- Resources Economics Studies Section.
- Administrative Affairs Section.

f. General Department for Data Processing is responsible for: (1) expanding the agricultural sector's data base; (2) transferring sampling information to a data base which can be used in economic studies. These economic studies will in turn become the indicators for decision making in the agricultural sector; (3) programing the preliminary data of the agricultural census into classified tables in order to facilitate decision making; (4) maintaining a nation-wide computer system to obtain timely and precise data; and (5) cooperating in the design of GOE development plans and supervising their implementation.

The General Department for Data Processing includes: (1) System Analyses Department, (2) transfer Programing Department, (3) Training Department, (4) Computer Operating Department, (5) System Engineering Department, and (6) Administrative Affairs Section.

In addition to the above six general departments, the U/AES has a Technical Office which provides secretarial support and an Administrative and Financial Affairs Department. It also has a Central Statistics Department which is considered a link between the MALR and the Central Agency for Popular Mobilization and Statistics and is responsible for implementing the statistic programs planned by the Central Agency for the Agriculture Sector. It also provides the Central Agency with requested data

and statistics.

Currently, the Undersecretary of AES is considering a reorganization of the above mentioned organizational structure. A survey will be made by an assessment team in the near future to study the possibility of having three coordinators under the AES Undersecretary to: (1) coordinate all statistical activities which are conducted by the General Department of Census, Statistics, and Statistics Estimation by Sampling; (2) coordinate and supervise the data processing which is conducted by the General Department for Data Processing and a new general department for data processing which may be established on the governorate level; and (3) coordinate policy and economic activities which are conducted by the General Department for Marketing and the General Department for Economic Studies.

The Undersecretary of AES is planning to delegate authority for implementing the policy analysis component's approved annual work plans to the three coordinators. The assessment team will submit to U/AES a report which should includes recommendations to improve the U/AES organization structure and management capability. Chart 4 is the proposed organizational structure to be reviewed by the assessment team.

D. U/AES Project Implementation Capabilities

1. Management

While the administration of the Data Collection and Analysis Project (DCA) changed from being managed by the present U/AES Director only in the past twelve months, this has provided a partial test of the U/AES ability to administer a USAID project. Indeed, the DCA Project's expenditure rate and use of technical assistance have accelerated markedly during the past year.

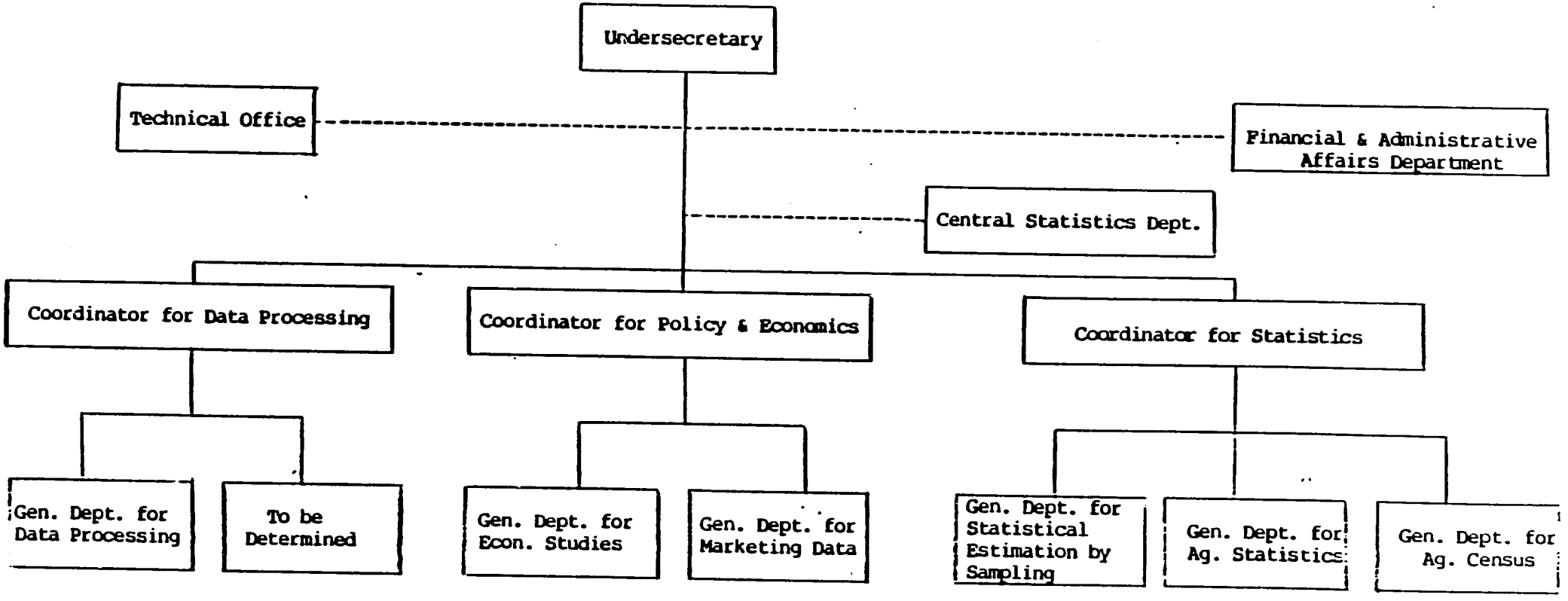
Because of the proposed levels of inputs for the policy analysis component, it is apparent that the component's GOE Director will need to delegate authority and responsibilities to the various U/AES Department Directors and Coordinators in order to produce the planned outputs. This process has been considered by the Undersecretary of AES who is planning to request an external assessment team to survey the U/AES organizational structure, including recommending areas for improving the management structure. The Undersecretary is prepared to delegate authority based on the assessment team's recommendations.

2. Contracting and Reporting

The U/AES contracting and reporting capabilities will be assessed shortly by USAID (as mentioned above, under the section on ARC's Contracting and Reporting). U/AES has experience with host country contracting under the AID-financed DCA Project. All anticipated long-term contracting needs of the policy analysis component will be under a single host country contract with the exeption of a two-year resident USDA PASA. If the results of the USAID/FM

CHART 4

PROPOSED ORGANIZATION CHART FOR THE
UNDERSECRETARIAT FOR AGRICULTURAL ECONOMICS AND STATISTICS






54

assessment indicate weaknesses in the U/AES contracting and reporting capacity (including ability to manage host country contracts), then the component implementation plans may be revised as appropriate.

3. Financial Status

The U/AES works directly with the MALR Undersecretary for Finance and Administrative Affairs regarding budget matters. The U/AES Administrative and Financial Affairs Department is successfully handling the financial and administrative matters of the current DCA Project and will be responsible for the same under the policy analysis component. Therefore, U/AES financial status, as such, does not appear to be a factor in how promptly project implementation decisions can be made.

4. Staffing

The U/AES has approximately 1,500 staff with 900 professionals holding university degrees. One has a PhD, eight have Master's degrees, twenty five have Diplomas, and most have received post university technical training. The pool from which participants for training abroad will be selected is sufficient. However, English language capabilities need to be strengthen for the majority of the U/AES professional staff.

The Office of Undersecretariat for Agricultural Economics and Statistics is an on-going concern and the management of project resources will not require a basic change in its functions or a need for major restructuring of the organization although a possible re-organization will be determined by an external assessment team. However, the first year's efforts will require a special effort in policy reform monitoring which will impact on its routine activities. This will, therefore, require careful distribution of the work for the in-house staff and contracting out work as appropriate. The policy monitoring unit will be a new unit in the General Department for Economic Studies. As a result, this Department will have to shift its focus to policy analysis.

5. Weaknesses

Because the proposed resources for the policy analysis components proposed resources represents a significant increase over the GOE's low levels of financing for the U/AES, it is apparent that the Component Director will need to delegate more authority to the various U/AES Director Generals and to strengthen the coordination between the general areas for policy analyses, statistics, and data processing.

The U/AES includes a number of competent, motivated individuals. However, they lack experience and technical expertise in policy analysis, sampling and survey design, and computer programing. The U/AES is suffering from inadequate training available to staff.

Until recently, their operating environment was not totally conducive to policy analysis or assessment of policy alternatives. Thus, past opportunities to acquire the requisite skills or experience were lacking. The future capability of the U/AES to perform policy analysis functions depends critically on: (1) the adequacy and appropriateness of training proposed by this project, (2) salaries and other incentives that will be offered to retain key individuals, and (3) the ability to generate and stimulate demand for policy analysis from decisionmakers.

6. Proposed Remedies

As mentioned above, an assessment team will shortly survey and review the U/AES organizational structure and managerial capabilities. The Component Director will request the team to study the feasibility of having three coordinators directly reporting to him in the areas of policy analysis, statistics, and data processing. He will also request the team to submit ideas and recommendations which will strengthen coordination between these three areas. The Component Director is expected to establish a NARP implementation or executive office within the U/AES and to delegate authority and responsibilities to each coordinator in their respective area of duty.

The current USDA long-term Data Processing Advisor will provide technical assistance to the data processing directorate. His terms of reference include performing a management role until such time as his counterpart is fully capable of managing the data processing operation. The other long-term advisors which are proposed by this component will assume a more traditional role of providing technical advice and jointly participating in economic analyses and developing statistical programs and activities. Nevertheless, they will also provide managerial advice to their counterparts. These advisors will undoubtly have a positive influence on the administration of the component as has proven to be the case with the predecessor project, the DCA. The policy analysis component will allow sufficient funding for training the U/AES technical staff as well as the managers and the administrative staff.

The U/AES may use short-term technical assistance consultants to be provided under the USDA PASA to help in developing the specifications and tender documents for the component's primary contractor.

As a lesson learned from the early stages of NARP implementation, the smaller the number of contracts involved, the less is the burden on the host country and USAID in managing the project. Therefore, it is envisioned in the implementing of the policy analysis component to have a single primary technical assistance contractor responsible for providing long-term and short-term technical assistance, placement and administration of the out-of-country training, and procurement of off-shore commodities.

E. Conclusion

It is concluded that with the policy analysis component's proposed technical assistance, training, commodities, and other support services, as discussed above, the policy analysis component is administratively feasible and its implementation plan is workable.

ANNEX H
ATTACHMENT 1

# STATEMENT OF WORK

## 1. Background

### 1.1 What is the Contract Purpose?

The purpose of this contract is to strengthen safeguards over the use of AID funds and to improve the implementation of AID projects in Egypt by realistically appraising the ability of Govt. of Egypt implementing agencies to:

a) advertise, negotiate and award contracts
b) monitor contract implementation
c) examine invoices
d) audit contractor records & reports
e) budget, account, disburse and report on the use of AID funds advanced

### 1.2 Relevant Studies, Data, Reports

a) Payment Verification Policy Implementation Guidance, (PVPIG) Dec 30, 1983, especially Payment Policy Statements numbered 5 & 6 & 8?
b) FM Statement # 05, May 13 1987 (Att. 1.A)
c) FM Bulletin No. 02/87 (Att. 1.B)
d) AID Handbook 11, Host Country Contracting
e) HBK 3 Suppl B, especially App. B. (Att. 1.C)

### 1.3 How do we know that the need for this contract exists?

The need to perform appraisals results from requirements imposed by PVPIG. The large number of host country implementing agencies to be assessed, the limited number of direct hire Financial Analysts available, and the need for Arabic fluency require the use of contractor assistance.

### 1.4 How does this contract relate to other mission tasks?

The assessments performed under this contract will be used in the following ways:

a) summaries of the assessments will be used in project papers as required by PVPIG Statement 5.B.2.(C)
b) The assessments may influence the selection of contracting and financing methods proposed for AID projects in the Project Papers.

c) The assessments may identify host country implementing agency weaknesses and give suggestions for strengthening those agencies before other project activities begin.
d) Taken as a group, the assessments may bring to light weaknesses which occur so frequently as to deserve major bi-lateral attention.
e) The assessments as a group will provide useful information for the Mission General assessment described in PVPIG 1, 8.D., and 9

2. Objective

The intended outcome of this contract is the preparation of 20 Report(s) appraising 20 assessable unit(s) (A.U.):

An assessable unit (A.U.) is a Government of Egypt (GOE) Ministry, for example Ministry of Agriculture, named as the implementing agency on one AID project. One GOE ministry implementing two AID projects equals two A.U's which would lead to two separate appraisal reports.

3. Tasks

3.1 Pre-Assessment Survey

a) For each A.U. named in section 2, above, the contractor shall carry out a pre-assessment survey. He shall consult with appropriate AID personnel to identify major contact points in the A.U. and draft an introductory letter which the contract project officer (CPO) will send to the A.U. describing reasons for the assessment and the cooperation required from the A.U.

b) The contract project officer (CPO) (see Section 6.1.) shall give the contractor a Chart of Implementation and Financing Methods (see sample in FM Statement No. 05, Att. 1.A) which shall identify the host country administered implementing activities. For each such activity the contractor shall produce a process flow chart showing the responsible offices within the A.U. and the administrative functions they will perform. A sample format for this Chart is given as ATT 1.A.

This flow chart shall identify the A.U. offices responsible for the following functions, as appropriate:

- performing feasibility studies
- developing tenders
- advertising tenders
- reviewing bids
- making awards
- executing contracts
- receiving performance guarantees
- supervising the contractor
- monitoring contract performance
- examining contractor invoices
- auditing contracts
- paying the contractor/vendor
- accounting for costs
- controlling inventory
- processing insurance claims
- clearing equipment through customs
- other administrative functions as appropriate.

c) The contractor shall identify the GOE laws and procedures which regulate the A.U. and its offices in performing their administrative functions.

d) After completing the pre-assessment survey the contractor shall give a written report in acceptable form to the CPO which shall consist of:

1. a system flow chart for each HC administered implementing activity in the format shown in Att. 1.D
2. a preliminary list of relevant GOE laws & procedures regulating the activity
3. a list of A.U. offices to be assessed
4. a brief written report stating what obstacles if any were encountered in performing the pre assessment survey, and which are expected to impede the assessment itself.
5. a work plan and schedule for the assessment.
6. an assessment program detailing the specific procedures to be followed in accomplishing the objectives of the assessment.
7. the contractor shall brief the CPO on the pre-assessment and on his work plan schedule and program for the assessment. The two shall agree on these before beginning the assessment.

3.2 Assessment: Two Major Categories

The assessment of each AU will comprise a number of sub-assessments which will be related to the various types of implementing methods to be undertaken by the various implementation units within the AU. An implementing method is a method of procuring a set of goods and/or services. An implementing unit is an organizational unit with primary responsibility for managing an implementation action or actions.

For purposes of conducting assessments, there are two major categories of implementing methods: first, those in which the implementing unit receives funds from AID and subsequently makes direct payments to the suppliers; second, those in which AID makes direct payments to the suppliers.

Agreements in the first category usually take the form of Project Implementation Letters, between AID and the GOE implementing unit. Funds flow from AID to the GOE implementing unit to the supplier. In these cases the contractor must assess, in addition to the implementing unit's ability to carry out its implementing responsibilities, the implementing unit's ability to control and report on its use of AID funds.

Agreements in the second category usually take the form of Letters of Commitment, between AID and the supplier or the supplier's bank. Funds flow from AID to the supplier, or from AID to a U.S. bank to the supplier. In these cases the contractor need not assess the implementing unit's ability to control and report on its use of AID funds since it does not receive AID funds. The contractor shall only assess the implementing unit's ability to carry out its implementing responsibilities.

3.3 Category One Assessments

a) For category one activities the contractor shall assess the implementing unit's ability to control and report on its use of AID funds in accordance with the guidelines and program included as Attachment 1.E.

b) The contractor shall draft introductory letters as he deems necessary. Aid shall type the letters on AID letterhead, sign them, and give them to the contractor.

Attachment 2 includes a program for a limited audit of accounting and internal controls of an ongoing PIL agreement. In new or proposed projects there may be no such ongoing agreement. In this case the contractor will develop its own program to make its assessment based on the inherent capability and procedures of the implementing unit, and upon its past performance in managing similar agreements.

c) The contractor shall assess the implementing unit's ability to carry out its other implementing responsibilities as required in Section 3.4, below.

3.4 Category Two Assessments

a) the contractor shall draft introductory letters as he deems necessary. AID shall type the letters on AID letterhead, sign them, and give them to the contractor.

b) the contractor shall assess the A.U. in order to answer the following questions:

- Where AID has had prior experience with the Contracting Agency, i.e., the A.U.:

- Was the performance of the Contracting Agency considered satisfactory enough to warrant continued contracting under AID standards? If not, were the deficiencies noted susceptible of remedy or correction through further Mission assistance which, if provided would justify additional contracting by the same Agency? What USAID Mission resources would likely be required to provide such additional assistance.

- For all A.U's assessed, whether or not AID has had prior experience with the AU:

- Is contracting for services or commodities a regular and continuing function of the Contracting Agency? If not, is the procurement to be undertaken likely to be a limited or isolated experience with little or no institutional benefit warranting use of the host country contracting mode?

- Does the Agency have a technically qualified procurement staff capable of soliciting competition, evaluating and selecting contractors? Capable of negotiating, awarding, administering, and monitoring contracts?

- Are the Agency's bidding, evaluation, and award systems fair and defensible?

- Is the Agency experienced in international competitive bidding? Is it familiar with cost reimbursement and time-rate contracts? Contracting for professional and technical services? Does it have sound procedures for dealing with bid protests?

- Is the Agency's general reputation favorable? Does its record indicate that it functions with reasonable efficiency and responsiveness to schedules and deadlines?

- Does the Agency have a disputes and claims settlement process which is considered fair and equitable? Does it have adequate legal counsel available to it?

- Does the Agency have adequate authority to negotiate and award contracts, approve contractor vouchers, pay contractors promptly, amend contracts, etc. without requiring the approval of other host country entities? If not, are such external approval requirements likely to delay or complicate the contracting process excessively?

- Are there local laws, regulations, or practices governing host country procurement which are significantly inconsistent with AID rules or which are likely to hamper seriously the procurement process? If so, how specifically can these be reconciled or dealt with?

- Are there any impediments -- legal, cultural, administrative, or other -- which may make it difficult for U.S. firms to compete?

- Are qualified audit facilities available to the Contracting Agency to assure that contracts are properly audited as required?

- What demands are likely to be made on AID Mission staff to instruct Contracting Agency concerning AID procurement rules and procedures, and to provide guidance and assistance to it during the contracting process?

c) The contractor shall familiarize himself with the applicable AID regulations, principally AID HB 11, and AID HB 3, Supplement B. (see Att. 1.C).

d) The contractor shall assess the capability of each of the offices in the A.U. to successfully perform their job as required by the project and in accordance with applicable AID regulations. The offices assessed will be those contained in section 3.1.d.3., above.

e) For each such office the contractor shall prepare an organization chart.

f) The contractor shall secure copies of laws, regulations and procedures governing the operation of that office, assess their adequacy, and describe the extent to which they are followed.

i) The contractor shall assess whether the procedures governing the operation of the office are appropriate to accomplish the tasks required by the project.

g) The contractor shall assess whether the training and experience of the office's staff is adequate to do the type of work required.

h) The contractor shall assess whether the office contains sufficient staff to accomplish the expected volume of work required by the project.

j) The contractor shall highlight any deficiencies found in the written report.

k) The contractor shall recommend specific minimally required corrective measures to improve the capability of the office to perform its function whenever the assessment shows that the office is not minimally capable of achieving the tasks required by the AID project.

l) The contractor shall recommend additional actions to improve the capability of the office beyond minimal requirements whenever the contractor feels he has some useful suggestions to make.

m) The contractor shall prepare a written report communicating the results of the assessments required. The report shall contain an executive summary. Copies of laws, regulations and procedures obtained by contractor shall be attached to the report. Copies may be in Arabic, but the contractor shall prepare English summaries of these documents. If copies are unavailable the contractor shall describe the documents' most important functions.

4. Reports and Deliverables

4.1 The contractor shall prepare an original and 10 copies of the pre-assessment report as described in 3.2.d , above. The report shall be in English. The contractor shall deliver the report to the CPO, after the pre-assessment survey and before the assessment.

4.2 The contractor shall likewise prepare an assessment report as described in 3.2.6 , above, original & 10 copies, however only one set of GOE laws, regulations, procedures, decrees, sample GOE forms, accounting forms and other sample documents supporting the assessment shall be supplied to AID along with the assessment report.

5. Personnel

5.1 Assessment team members must be experienced in Public Administration Systems, Accounting Internal Control Review, Management Assessment, Procurement Systems and Organizational Studies.

5.2 All team members doing the assessment must speak and read Arabic at the equivalent of FSI grade 5 (no certificate required). Team members writing the reports will require an equivalent English capability

5.3 The length of time for each assessment team member is to be determined by the pre-assessment survey.

6. Roles & Responsibilities - AID

6.1 The contractor shall report to the AID contract project officer (CPO) who will be a USDH or FSN member of the Controller's Office.
AID's role is to:

a) provide the contractor with the Chart on Methods of implementation and Financing, which will identify the activities to be assessed.

b) brief the contractor on the aims of the project by providing him with copies of relevant, PID's, project papers and agreements, explaining them as necessary.

c) explain to the contractor, as necessary, AID contracting and financing procedures, and the objectives of the PVPIG as they apply to the assessments.

d) AID, acting primarily through the AID project technical office, shall introduce the contractor to the principal GOE officials, and intervene as necessary to maintain a productive working relationship between the contractor and the AU.

e) discuss with contractor the results of the pre-assessment survey and approve the assessment work plan, schedule and program.

f) review for acceptance the final assessment report.

g) pay the contractor.

.2 the role of the Host Country is to:

a) make available to the contractor managerial and operational personnel whom the contractor may interview, as required, to perform the assessment.

b) make available to the contractor documents required for the assessment. "Make available" means either provide copies at the host country's expense or lend documents to be copied at the contractor's expense and chargeable to the contract:

.3 Donors other than the U.S. government have no role in these assessments.

. Logistics

.1 AID will type introductory letters on AID letterhead as required. Draft letters will be prepared by the contractor.

.2 all other logistic support shall be supplied by the contractor.

.3 all work will be performed in Egypt. Some work may be performed outside of the Cairo metropolitan area.

. Level of Effort

A very rough estimate of the level of effort required would be 30 man/days per assessment.

As a guess, I would say that at least 20 assessments would be completed over the next two years.

558

Assessments would be funded either out of the projects themselves, for ongoing projects, or out of project 263-0102 for new projects.

9. Evaluation Criteria

9.1 What are the team leader's qualifications?

9.2 What is the organization's capability in the areas of management assessment, Public Administration systems, organizational studies, and Internal Control Reviews?

9.3 What is the firm's ability to assign qualified personnel?

9.4 What is the quality of the firm's proposal?

ECONOMIC AND FINANCIAL ANALYSIS

Agricultural Research and Technology Transfer under the major cereals (EMCIP), rice (RRT) and agriculture mechanization (AMP) projects have proven profitable on the fields of the farmers participating in the demonstration projects. This amendment of the original NARP project addresses the fundamental need for an effective diffusion system and a supportive policy environment by adding Technology Transfer and Policy components.

Table 1 shows the current financial and economic returns of a feddan of land for the principal Egyptian crops. On the basis of the experience under the EMCIP and other research projects in Egypt which achieved increased yields of 30 to 80 percent in demonstrations plots, we assume that research and effective technology transfer under this amendment will replicate these performances. We, therefore, conservatively postulate an average increase in yields of 30 percent for each of the crops included in this analysis. Given expected efforts to economize in the use of inputs within an integrated farm management system, we assume that in the absence of input price changes adoption of new technology will not lead to significant increases in costs. This scenario leads us to expect significant increases in income per feddan of all crops. As is shown below, the assumption of the basic scenario that by the end of the project new technology will be adopted in only twenty percent of the land allocated to each crop makes the return to the project significantly more moderate than one would anticipate by assuming a yield increase in the absence of an increase in costs. Previous adoption rates make this assumption credible but somewhat conservative. If however the project is justified under this scenario we feel confident of its economic and financial viability. Note that these assumptions on yields and adoption rates would result in a six percent increase in the total output to Egyptian agriculture by the fifth year of the project.

The economic returns of the crops reviewed in Table 1 follow from the same assumptions used for the financial analysis, but the inputs and outputs are valued at their economic costs. Note that the ranking of the crops on economic grounds is significantly different from their financial ranking. Looking at the "with project" situation, the most profitable crops, on economic grounds are cotton, rice and tomatoes as opposed to long berseem, rice and tomatoes on financial criteria. This change in ranking shows the potential importance of the policy component. The success of this component will have to be measured not only by an improved and more functional data collection and dissemination system but more importantly by its contribution to a shift to an incentive system more in tune with Egypt's integration into the world market according to its international comparative advantage.

The relevance of this shift to a less distorted environment is captured in Table 2. This table aggregates the costs and benefits of the individual crops with and without the NARP to the national level. In order to capture the benefits of an improved policy environment, this analysis disaggregates the project into (1) Research, Technology Transfer Seed and New Initiatives (RTT), and RTT plus Policy. The aggregation from the one feddan single crop into the total project at the national level assumes that in the absence of a change in the policy environment, the different crops will continue to claim the same share of land as they do currently. In the scenario which includes the policy component, the area allocated to the different field crops (excluding vegetables, which are expected to continue to expand as per historical trend) is assumed to shift gradually toward the crop pattern which existed in 1972. (1972 is the first year in which we have complete data on the allocation of the different crops). In the absence of information needed to determine an optimal sectorwide crop allocation, we believe this alternative allocation to be a reasonable assumption about the potential change in crop areas due to an improved policy environment. This choice is made on the belief that the agricultural policy environment has deteriorated as the relevant parameters such the official exchange rates got further and further apart from international parity.

On the basis of these assumptions, the financial internal rate of return (FIRR) for the RTT components under the basic scenario is 41 percent. The addition of the policy component leads to an FIRR of 45 percent. Recall that the difference between these two scenarios is a different allocation of land and a relatively small increase in project costs due to the costs of the policy component. The importance of the policy component becomes evident in the analysis summarized Table 3. This Table is analogous to Table 2, but the prices are more in tune with Egypt's international comparative advantage. In this case, the addition of the policy component leads to significant improvement in the economic internal rate of return (EIRR). Specifically, the EIRR with the RTT components is .63 but rises to 3.08 when the Policy component and the resultant expected change in the distribution of land among the different crops is taken into consideration. Table 3 shows the crucial importance of the project and especially of an improved policy environment for Egyptian agriculture.

Table 4 shows the results of changes in key assumptions on the benefit/cost calculations for the project. A change in the project target area from 4.5 million feddans to 3 million with all other variables remaining as in the basic case, lowers the FIRR to 22 percent in the scenario that excludes the policy component. As in the basic case, the difference between the "with policy" and "without policy" scenario does not make a very significant

difference in financial returns. The economic analysis of alternative I also shows that the reduction of the target area lowers the returns to the project significant but the project still remain extremely attractive with EIRR of .38 in the "without policy" case and 2.0 in the "with policy scenario". The simulation summarized in Alternative II shows the project to be extremely sensitive to assumption on yield changes. In this scenario the expected yield increase for all crops was raised to 50 percent. The financial internal rates of return increased to 72 percent and 75 percent in the "without policy" and the with policy respectively. This simulation underscores the need to ascertain actual generation and adoption of the research. As in all the simulations, the economic returns of the project continue to point to its feasibility and once again the importance of effective policy changes is underscored. The EIRR for this scenario are 110 percent in the absence of the changes in the policy environment but rise significantly to 3.68 in the "with policy scenario".

Alternative III raises the maximum adoption rate to 30 percent (from the basic maximal adoption rate of 20 percent) while keeping to other assumptions as in the basic case. Table 4 shows a moderate improvement compared with the basic case but shows the project to be only moderately sensitive to returns occurring after the fifth year of the project. This shows the need to implement the project as fast as it is technically feasible.

In summary we find this project to have significant payoff and fully justified on economic and financial calculations. Financial profitability is the calculation the farmer is expected to make. On the other hand, economic profitability is the relevant economic variable from the national point of view. It is this variable therefore which is of fundamental importance. The same choice on the use of resources is made on the basis of this variable.This analysis has shown, therefore, that this project is fully justified if it leads to an environment close to what is assumed for the calculations of the EIRR inclusive of the Policy component. It is less, but still amply, justified on strictly financial calculations if the extension component is effective enough to result in the moderate adoption rates we assume and if the Research component continues to maintain or improve the yields obtained under the previously mentioned EMCIP and Rice projects. Tables 1A through 1I present the crop budgets used in this analysis while Table 5 presents the project costs.

Doc.: NARPECOZ
PDS/E, 8/01/88

TABLE 1. SUMMARY OF CROP RETURNS PER FEDDAN

| | Cotton | Rice | Maize | Sorghum | Wheat | Catch Berseem | Long Berseem | Broad-Beans | Tomatoes |
|---|---|---|---|---|---|---|---|---|---|
| **FINANCIAL ANALYSIS** | | | | | | | | | |
| WITHOUT PROJECT | | | | | | | | | |
| Benefit | 864.00 | 670.50 | 585.15 | 362.94 | 632.19 | 400.00 | 800.00 | 511.94 | 1000.00 |
| Cost | 618.55 | 485.26 | 428.89 | 307.64 | 400.71 | 202.08 | 292.17 | 316.90 | 541.12 |
| Net benefit | 245.46 | 185.24 | 156.26 | 55.30 | 231.48 | 197.92 | 507.83 | 194.94 | 458.88 |
| WITH RESEARCH + TECH | | | | | | | | | |
| Benefit | 1116.00 | 1084.30 | 750.17 | 468.15 | 740.00 | 520.00 | 1040.00 | 635.15 | 1300.00 |
| Cost | 618.55 | 485.26 | 428.89 | 307.64 | 400.71 | 202.08 | 292.17 | 316.90 | 541.12 |
| Net benefit | 497.46 | 599.04 | 321.28 | 160.51 | 339.29 | 317.92 | 747.83 | 318.25 | 758.88 |
| WITH RES + TECH + POL | | | | | | | | | |
| Benefit | 1116.00 | 1084.30 | 750.17 | 468.15 | 740.00 | 520.00 | 1040.00 | 635.15 | 1300.00 |
| Cost | 618.55 | 485.26 | 428.89 | 307.64 | 400.71 | 202.08 | 292.17 | 316.90 | 541.12 |
| Net benefit | 497.46 | 599.04 | 321.28 | 160.51 | 339.29 | 317.92 | 747.83 | 318.25 | 758.88 |
| **ECONOMIC ANALYSIS** | | | | | | | | | |
| WITHOUT PROJECT | | | | | | | | | |
| Benefit | 3024.00 | 1980.00 | 644.98 | 359.88 | 829.41 | 200.00 | 400.00 | 660.80 | 1000.00 |
| Cost | 1357.36 | 1070.34 | 745.68 | 564.92 | 726.74 | 404.09 | 630.85 | 571.64 | 837.53 |
| Net benefit | 1666.64 | 909.66 | -100.70 | -205.04 | 102.66 | -204.09 | -230.85 | 89.16 | 162.47 |
| WITH RESEARCH + TECH | | | | | | | | | |
| Benefit | 3924.00 | 2604.00 | 827.94 | 465.09 | 1037.31 | 260.00 | 520.00 | 828.80 | 1300.00 |
| Cost | 1357.36 | 1070.34 | 745.68 | 564.92 | 726.74 | 404.09 | 630.85 | 571.64 | 837.53 |
| Net benefit | 2566.64 | 1533.66 | 82.27 | -99.83 | 310.56 | -144.09 | -110.85 | 257.17 | 462.47 |
| WITH RES + TECH + POL | | | | | | | | | |
| Benefit | 3924.00 | 2604.00 | 827.94 | 465.09 | 1037.31 | 260.00 | 520.00 | 828.80 | 1300.00 |
| Cost | 1357.36 | 1070.34 | 745.68 | 564.92 | 726.74 | 404.09 | 630.85 | 571.64 | 837.53 |
| Net benefit | 2566.64 | 1533.66 | 82.27 | -99.83 | 310.56 | -144.09 | -110.85 | 257.17 | 462.47 |

TABLE 1A. WITHOUT PROJECT

ONE FEDDAN SINGLE CROP BUDGET FOR COTTON

| | Unit | QUANTITY Total | QUANTITY Official | QUANTITY Market | FINANCIAL PRICES Average | FINANCIAL PRICES Official | FINANCIAL PRICES Market | ECONOMIC PRICE | Financial Value | Economic Value |
|---|---|---|---|---|---|---|---|---|---|---|
| BENEFIT | | | | | | | | | 964 | 7024 |
| Fiber | Ton | 0.4 | 0.4 | 0 | 2100 | 2100 | | 7500 | 840 | 3000 |
| Fodder | Ton | 8 | | 8 | 3 | | 3 | 3 | 24 | 24 |
| COSTS | | | | | | | | | 619 | 1357 |
| Seeds | Kg | 80 | 80 | | 0.03 | 0.03 | | 0.3 | 2 | 24 |
| Labor | Man-day | 64 | | 64 | 4.85 | | 4.85 | 4.85 | 310 | 310 |
| Water | m3 | 7800 | 7800 | | 0 | | | 0.05 | 0 | 390 |
| Fuel(l/hr)= 1 | Litre | 52 | | 52 | 0.028 | | 0.028 | 0.16 | 1 | 9 |
| Electricity | Kwh | | | | | | | | 0 | 0 |
| Fertilizers | | | | | | | | | | |
| Nitrogen(100%) | Kg | 96 | 78 | 8 | 0.374 | 0.31 | 1 | 0.615 | 32 | 53 |
| Potassium(100%) | Kg | 0 | 0 | | | 0.13 | 0.47 | 0.657 | 0 | 0 |
| Phosphate(100%) | Kg | 15 | 15 | | 0.23 | 0.23 | 0.44 | 0.77 | 3 | 12 |
| Foliar | Kg | 2 | 2 | | 3 | 3 | | 3 | 6 | 6 |
| Manure | m3 | 16.5 | | 16.5 | 2.5 | | 2.5 | 2.5 | 41 | 41 |
| Chemicals | | | | | | | | | | |
| Fungicides | Litre | | | | | | | | 18 | 250 |
| Insecticides | Litre | | | | | | | | 0 | 0 |
| Herbicides | Litre | 0 | | | | | | | | 0 |
| Other | Litre | 0 | | 0 | | | | | | 0 |
| Machinery | | | | | | | | | | |
| Tractor | Hour | 5.638 | | 5.638 | 10 | | 10 | 19 | 56 | 107 |
| Pumpset m3 150 | Hour | 52 | | 52 | 2 | | 2 | 2 | 103 | 103 |
| Transportation | Hour | 1 | | 1 | 10.2 | | 10.2 | 19 | 10 | 19 |
| Planting Drill | Hour | 0 | | | | | | | 0 | 0 |
| Sprayer | Hour | 0 | | | | | | | 0 | 0 |
| Other Aplicator | Hour | 0 | | | | | 0 | | 0 | 0 |
| Animals | | | | | | | | | | |
| Cultivation | Hour | 7.5 | | 7.5 | 0.75 | | 0.75 | 0.75 | 6 | 6 |
| Transport | Hour | 2 | | 2 | 0.95 | | 0.95 | 0.95 | 2 | 2 |
| Bags and Other | LE | | | | | | | | 27 | 27 |
| Short Term Finance | LE | | | | | | | | | |
| NET BENEFITS | | | | | | | | | 245 | 1667 |

TABLE 13. WITHOUT PROJECT
ONE FEDDAN SINGLE CROP BUDGET FOR PADDY RICE

| | Unit | QUANTITY Total | QUANTITY Official | QUANTITY Market | FINANCIAL PRICES Average | FINANCIAL PRICES Official | FINANCIAL PRICES Market | ECONOMIC PRICE | Financial Value | Economic Value |
|---|---|---|---|---|---|---|---|---|---|---|
| BENEFIT | | | | | | | | | 670.5 | 1980 |
| Grain/Fruit/Fiber | Ton | 3.5 | 1.5 | 2 | 191.5714 | 165 | 211.5 | 520 | 670.5 | 1920 |
| Fodder | Ton | 4 | 0 | 4 | | | 40 | 40 | 0 | 160 |
| COSTS | | | | | | | | | 485 | 1070 |
| Seeds | Kg | 60 | 60 | 0 | 0.4 | 0.4 | | 0.4 | 24 | 24 |
| Labor | Man-day | 33 | 0 | 33 | 4.85 | 0 | 4.85 | 4.85 | 160 | 160 |
| Water | m3 | 10000 | 10000 | | | | | 0.05 | 0 | 500 |
| Fuel | Litre | 66.667 | | 66.667 | 0.028 | 0 | 0.028 | 0.16 | 2 | 11 |
| Electricity | Kwh | | | | | | | | 0 | 0 |
| Fertilizers | | | | | | | | | | |
| Nitrogen(100%) | Kg | 76 | 76 | 0 | 0.31 | 0.31 | 1 | 0.615 | 24 | 47 |
| Potassium(100%) | Kg | 0 | 0 | 0 | 0 | 0.13 | 0.47 | 0.657 | 0 | 0 |
| Phosphate(100%) | Kg | 15 | 15 | 0 | 0.23 | 0.23 | 0.44 | 0.77 | 3 | 12 |
| Foliar | Kg | 1 | 1 | 0 | 3 | 3 | 5 | 3 | 3 | 3 |
| Manure | m3 | 3.4 | 0 | 3.4 | 2.5 | 0 | 2.5 | 2.5 | 9 | 9 |
| Chemicals | | | | | | | | | 20 | 20 |
| Fungicides | Litre | 20 | 20 | | 0.9985 | 0.9985 | 0 | 0 | 0 | 0 |
| Insecticides | Litre | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 |
| Herbicides | Litre | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Other | Litre | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Machinery | | | | | | | | | | |
| Tractor | Hour | 9 | | 9 | 5.5 | | 5.5 | 9 | 50 | 81 |
| Pumpset | Hour | 66.667 | 0 | 66.667 | 2 | | 2 | 2 | 131 | 131 |
| Transportation | Hour | 3 | 0 | 3 | 5 | | 5 | 9.5 | 15 | 29 |
| Planting Drill | Hour | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 |
| Sprayer | Hour | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 |
| Other Aplicator | Hour | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| Animals | | | | | | | | | | |
| Cultivation | Hour | 13 | 0 | 13 | 0.75 | 0 | 0.75 | 0.75 | 10 | 10 |
| Transport | Hour | 16 | 0 | 16 | 0.95 | 0 | 0.95 | 0.95 | 15 | 15 |
| Bags and Other | LE | | | | | | | | | |
| Short Term Finance | LE | | | | | | | | 20 | 20 |
| NET BENEFITS | | | | | | | | | 185 | 910 |

TABLE 1C. WITHOUT PROJECT

ONE FEDDAN SINGLE CROP BUDGET FOR MAIZE

| | Unit | QUANTITY Total | QUANTITY Official | QUANTITY Market | FINANCIAL PRICES Average | FINANCIAL PRICES Official | FINANCIAL PRICES Market | ECONOMIC PRICE | Financial Value | Economic Value |
|---|---|---|---|---|---|---|---|---|---|---|
| BENEFIT | | | | | | | | | | |
| Grain/Fruit/Fiber | Ton | 1.93 | 0 | 1.93 | 285 | | 285 | 316 | 585.15 | 644.98 |
| Fodder | Ton | 1.35 | | 1.35 | 26 | | 26 | 26 | 35.1 | 35.1 |
| | | | | | | | | | | |
| COSTS | | | | | | | | | 429 | 746 |
| Seeds | Kg | 25 | 25 | 0 | 0.49 | 0.49 | 0 | 0.49 | 12 | 12 |
| Labor | Man-day | 25 | | 25 | 4.85 | 0 | 4.85 | 4.85 | 121 | 121 |
| Water | m3 | 5100 | 5100 | | 0 | 0 | | 0.05 | 0 | 255 |
| Fuel | Litre | 34 | | 34 | 0.028 | | 0.028 | 0.16 | 1 | 5 |
| Electricity | Kwh | | | | | | | | 0 | 0 |
| Fertilizers | | | | | | | | | | |
| Nitrogen(100%) | Kg | 50 | 50 | | 0.31 | 0.31 | 1 | 0.615 | 16 | 31 |
| Potassium(100%) | Kg | 0 | 0 | | 0 | 0.13 | 0.47 | 0.657 | 0 | 0 |
| Phosphate(100%) | Kg | 15 | 15 | | 0.23 | 0.23 | 0.44 | 0.77 | 3 | 12 |
| Foliar | Kg | 0 | 0 | | 0 | 3 | 0 | 3 | 0 | 0 |
| Manure | m3 | 48 | | 48 | 2.5 | 0 | 2.5 | 2.5 | 120 | 120 |
| Chemicals | | | | | | | | | | |
| Fungicides | Litre | 4.375 | 4.375 | | 0 | 0 | 0 | 0 | 4 | 4 |
| Insecticides | Litre | | | | | | | 0 | 0 | 0 |
| Herbicides | Litre | | | | | | | 0 | 0 | 0 |
| Other | Litre | | | | | | | 0 | 0 | 0 |
| Machinery | | | | | | | | | | |
| Tractor | Hour | 5.2 | | 5.2 | 5.5 | | 5.5 | 9 | 29 | 47 |
| Pumpset | Hour | 34 | | 34 | 2 | | 2 | 2 | 67 | 67 |
| Transportation | Hour | 3.5 | | 3.5 | 5 | | 5 | 9.5 | 18 | 33 |
| Planting Drill | Hour | 0 | | | | | | 0 | 0 | 0 |
| Sprayer | Hour | 0 | | | | | | 0 | 0 | 0 |
| Other Applicator | Hour | 0 | | | | | | 0 | 0 | 0 |
| Other Aplicator | | | | | | | | | | |
| Animals | | | | | | | | | | |
| Cultivation | Hour | 12 | 0 | 12 | 0.75 | 0 | 0.75 | 0.75 | 9 | 9 |
| Transport | Hour | 12 | 0 | 12 | 0.95 | 0 | 0.95 | 0.95 | 11 | 11 |
| Bags and Other | LE | | | | | | | | 18 | 18 |
| Short Term Finance | LE | | | | | | | | | |
| NET BENEFITS | | | | | | | | | 156 | -101 |

TABLE 1C. WITHOUT PROJECT

ONE FEDDAN SINGLE CROP BUDGET FOR MAIZE

| | Unit | QUANTITY Total | QUANTITY Official | QUANTITY Market | FINANCIAL PRICES Average | FINANCIAL PRICES Official | FINANCIAL PRICES Market | ECONOMIC PRICE | Financial Value | Economic Value |
|---|---|---|---|---|---|---|---|---|---|---|
| ENEFIT | | | | | | | | | 585.15 | 644.98 |
| Grain/Fruit/Fiber | Ton | 1.93 | 0 | 1.93 | 285 | | 295 | 316 | 550.05 | 609.98 |
| Fodder | Ton | 1.35 | | 1.35 | 26 | | 26 | 26 | 35.1 | 35.1 |
| OSTS | | | | | | | | | 429 | 746 |
| Seeds | Kg | 25 | 25 | 0 | 0.49 | 0.49 | 0 | 0.49 | 12 | 12 |
| Labor | Man-day | 25 | | 25 | 4.85 | 0 | 4.85 | 4.85 | 121 | 121 |
| Water | m3 | 5100 | 5100 | | 0 | 0 | | 0.05 | 0 | 255 |
| Fuel | Litre | 34 | | 34 | 0.028 | | 0.028 | 0.16 | 1 | 5 |
| Electricity | Kwh | | | | | | | | 0 | 0 |
| Fertilizers | | | | | | | | | | |
| Nitrogen(100%) | Kg | 50 | 50 | | 0.31 | 0.31 | 1 | 0.615 | 16 | 31 |
| Potassium(100%) | Kg | 0 | 0 | | 0 | 0.13 | 0.47 | 0.657 | 0 | 0 |
| Phosphate(100%) | Kg | 15 | 15 | | 0.23 | 0.23 | 0.44 | 0.77 | 3 | 12 |
| Foliar | Kg | 0 | 0 | | 0 | 3 | 0 | 3 | 0 | 0 |
| Manure | m3 | 48 | | 48 | 2.5 | 0 | 2.5 | 2.5 | 120 | 120 |
| Chemicals | | | | | | | | | 4 | 4 |
| Fungicides | Litre | 4.375 | 4.375 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Insecticides | Litre | | | | | | | 0 | 0 | 0 |
| Herbicides | Litre | | | | | | | 0 | 0 | 0 |
| Other | Litre | | | | | | | 0 | 0 | 0 |
| Machinery | | | | | | | | | | |
| Tractor | Hour | 5.2 | | 5.2 | 5.5 | | 5.5 | 9 | 29 | 47 |
| Pumpset | Hour | 34 | | 34 | 2 | | 2 | 2 | 67 | 67 |
| Transportation | Hour | 3.5 | | 3.5 | 5 | | 5 | 9.5 | 18 | 33 |
| Planting Drill | Hour | 0 | | | | | | 0 | 0 | 0 |
| Sprayer | Hour | 0 | | | | | | 0 | 0 | 0 |
| Otrer Applicator | Hour | 0 | | | | | | 0 | 0 | 0 |
| Other Aplicator | | | | | | | | | | |
| Animals | | | | | | | | | | |
| Cultivation | Hour | 12 | 0 | 12 | 0.75 | 0 | 0.75 | 0.75 | 9 | 9 |
| Transport | Hour | 12 | 0 | 12 | 0.95 | 0 | 0.95 | 0.95 | 11 | 11 |
| Bags and Other | LE | | | | | | | | 18 | 18 |
| Short Term Finance | LE | | | | | | | | | |
| NET BENEFITS | | | | | | | | | 156 | -101 |

TABLE 1D. WITHOUT PROJECT

ONE FEDDAONE FEDDAN SINGLE CROP BUDGET FOR SORGHUM

| | Unit | QUANTITY Total | QUANTITY Official | QUANTITY Market | FINANCIAL PRICES Average | FINANCIAL PRICES Official | FINANCIAL PRICES Market | ECONOMIC PRICE | Financial Value | Economic Value |
|---|---|---|---|---|---|---|---|---|---|---|
| BENEFIT | | | | | | | | | 362.94 | 359.99 |
| Grain/Fruit/Fiber | Ton | 1.67 | | 1.67 | 210 | | 210 | 210 | 350.7 | 350.7 |
| Fodder | Ton | 1.02 | | 1.02 | 12 | | 12 | 9 | 12.24 | 9.19 |
| COSTS | | | | | | | | 45 | 308 | 565 |
| Seeds | Kg | 7.4 | 7.4 | 0 | 0.8 | 0.8 | 0 | 0.8 | 6 | 6 |
| Labor | Man-day | 20 | | 20 | 4.85 | 0 | 4.85 | 4.85 | 97 | 97 |
| Water | m3 | 4000 | 4000 | | 0 | | 0 | 0.05 | 0 | 200 |
| Fuel | Litre | 26.66666 | | 26.66666 | 0.028 | | 0.028 | 0.16 | 1 | 4 |
| Electricity | Kwh | | | | | | | | | |
| Fertilizers | | | | | | | | | | |
| Nitrogen(100%) | Kg | 20 | 20 | 0 | 0.31 | 0.31 | 1 | 0.615 | 6 | 12 |
| Potassium(100%) | Kg | 0 | 0 | | 0 | 0.13 | 0.47 | 0.657 | 0 | 0 |
| Phosphate(100%) | Kg | 4 | 4 | | 0.23 | 0.23 | 0.44 | 0.77 | 1 | 3 |
| Foliar | Kg | 0 | 0 | | 0 | 3 | 5 | 3 | 0 | 0 |
| Manure | m3 | 30 | 0 | 30 | 2.5 | 0 | 2.5 | 2.5 | 75 | 75 |
| Chemicals | | | | | | | | | | |
| Fungicides | Litre | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 4 |
| Insecticides | Litre | 0 | | | | | | | | |
| Herbicides | Litre | 0 | | | | | | | | |
| Other | Litre | 0 | | | | | | | | |
| Machinery | Man-day | | | | | | | | | |
| Tractor | Hour | 5 | | 5 | 5.5 | 0 | 5.5 | 9 | 28 | 45 |
| Pumpset | Hour | 26.66666 | | 26.66666 | 2 | | 2 | 2 | 53 | 53 |
| Transportation | Hour | 2 | | 2 | 5 | | 5 | 19 | 10 | 38 |
| Planting Drill | Hour | 0 | | | | | | 0 | 0 | 0 |
| Sprayer | Hour | 0 | | | | | | 0 | 0 | 0 |
| Otrer Applicator | Hour | 0 | | | | | | 0 | 0 | 0 |
| Other Aplicator | | | | | | | | | | |
| Animals | | | | | | | | | | |
| Cultivation | Hour | 8 | 0 | 8 | 0.75 | | 0.75 | 0.75 | 6 | 6 |
| Transport | Hour | 8 | 0 | 8 | 0.95 | | 0.95 | 0.95 | 8 | 8 |
| Bags and Other | LE | | | | | | | | 14 | 14 |
| Short Term Finance | LE | | | | | | | | | |
| NET BENEFITS | | | | | | | | 45.102 | 55 | -205 |

TABLE 1E. WITHOUT PROJECT

ONE FEDDAN SINGLE CROP BUDGET FOR WHEAT

| | Unit | QUANTITY Total | QUANTITY Official | QUANTITY Market | FINANCIAL PRICES Average | FINANCIAL PRICES Official | FINANCIAL PRICES Market | ECONOMIC PRICE | Financial Value | Economic Value |
|---|---|---|---|---|---|---|---|---|---|---|
| BENEFIT | | | | | | | | | 632 | 829 |
| Grain/Fruit/Fiber | Ton | 2.1 | | 2.1 | 171.13 | 233 | 171.13 | 330 | 359 | 693 |
| Fodder | Ton | 2.25 | | 2.25 | 121.25 | | 121.25 | 60.625 | 273 | 136 |
| COSTS | | | | | | | | | 401 | 727 |
| Seeds | Kg | 70 | 70 | 0 | 0.25 | 0.25 | 0 | 0.5 | 18 | 35 |
| Labor | Man-day | 30 | | 30 | 5 | 0 | 5 | 4.85 | 150 | 146 |
| Water | m3 | 4200 | 4200 | | 0 | | 0 | 0.05 | 0 | 210 |
| Fuel | Litre | 28 | | 28 | 0.028 | | 0.028 | 0.16 | 1 | 4 |
| Electricity | Kwh | | | | | | | | | |
| Fertilizers | | | | | | | | | | |
| Nitrogen(100%) | Kg | 90 | 90 | | 0.31 | 0.31 | 1 | 0.615 | 28 | 55 |
| Potassium(100%) | Kg | 24 | 24 | | 0.13 | 0.13 | 0.47 | 0.657 | 3 | 16 |
| Phosphate(100%) | Kg | 31 | 31 | | 0.23 | 0.23 | 0.44 | 0.77 | 7 | 24 |
| Foliar | Kg | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 0 |
| Manure | m3 | 15 | | 15 | 2.5 | 0 | 2.5 | 2.5 | 38 | 38 |
| Chemicals | | | | | | | | | 1 | 1 |
| Fungicides | Litre | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Insecticides | Litre | | | | | | | | | |
| Herbicides | Litre | | | | | | | | | |
| Other | Litre | | | | | | | 0 | 0 | 0 |
| Machinery | | | | | | | | | | |
| Tractor | Hour | 7 | | 7 | 5.5 | | 5.5 | 9 | 39 | 63 |
| Pumpset | Hour | 28 | | 28 | 2 | | 2 | 2 | 55 | 55 |
| Transportation | Hour | 4 | | 4 | 5 | | 5 | 9.5 | 20 | 38 |
| Planting Drill | Hour | 0 | | | | | | | | |
| Sprayer | Hour | 0 | | | | | | | | |
| Otrer Applicator | Hour | 0 | | | | | | | | |
| Other Aplicator | Hour | 0 | | | | | | | | |
| | | 0 | | | | | | | | |
| Animals | | | | | | | | | | |
| Cultivation | Hour | 15 | | 15 | 0.75 | | 0.75 | 0.75 | 11 | 11 |
| Transport | Hour | 15 | | 15 | 0.95 | | 0.95 | 0.95 | 14 | 14 |
| Bags and Other | LE | | | | | | | | 16 | 16 |
| Short Term Finance | LE | | | | | | | | | |
| NET BENEFITS | | | | | | | | | 231 | 103 |

TABLE 1F. WITHOUT PROJECT
ONE FEDDAN SINGLE CROP BUDGET FOR CATCH BERSEEM

| | Unit | QUANTITY Total | QUANTITY Official | QUANTITY Market | FINANCIAL PRICES Average | FINANCIAL PRICES Official | FINANCIAL PRICES Market | ECONOMIC PRICE | Financial Value | Economic Value |
|---|---|---|---|---|---|---|---|---|---|---|
| BENEFIT | | | | | | | | | 400 | 200 |
| Grain/Fruit/Fiber | Ton | | | | | | | | | |
| Fodder | Ton | 2 | 0 | 2 | 200 | | 200 | 100 | 400 | 200 |
| COSTS | | | | | | | | | 202 | 404 |
| Seeds | Kg | 15 | | 15 | 1.5 | | 1.5 | 1.5 | 23 | 23 |
| Labor | Man-day | 15 | | 15 | 4.85 | 0 | 4.85 | 4.85 | 73 | 73 |
| Water | m3 | 3700 | 3700 | | 0 | | 0 | 0.05 | 0 | 185 |
| Fuel | Litre | 24.66666 | | 24.66666 | 0.028 | | 0.028 | 0.16 | 1 | 4 |
| Electricity | Kwh | | | | | | | | | |
| Fertilizers | | | | | | | | | | |
| Nitrogen(100%) | Kg | 0 | | | | 0.31 | 1 | 0.615 | 0 | 0 |
| Potassium(100%) | Kg | | | | | 0.13 | 0.47 | 0.657 | 0 | 0 |
| Phosphate(100%) | Kg | | | | | 0.23 | 0.44 | 0.77 | 0 | 0 |
| Foliar | Kg | 0 | | | | 3 | 0 | 3 | 0 | 0 |
| Manure | m3 | 0 | | | | 0 | 2.5 | 2.5 | 0 | 0 |
| | | | | | | 0 | 0 | 0 | 0 | 0 |
| Chemicals | | | | | | 0 | 0 | 0 | 0 | 0 |
| Fungicides | Litre | 0 | | | | | | | | |
| Insecticides | Litre | 0 | | | | | | | | |
| Herbicides | Litre | 0 | | | | | | | | |
| Other | Litre | 0 | | | | | | | | |
| Machinery | | | | | | | | | | |
| Tractor | Hour | 2 | | 2 | 5.5 | | 5.5 | 9 | 11 | 18 |
| Pumpset | Hour | 24.66666 | | 24.66666 | 2 | | 2 | 2 | 49 | 49 |
| Transportation | Hour | 1.5 | | 1.5 | 5 | | 5 | 9.5 | 8 | 14 |
| Planting Drill | Hour | | | | | | | | | |
| Sprayer | Hour | | | | | | | | | |
| Otrer Applicator | Hour | | | | | | | | | |
| Other Aplicator | | | | | | | | | | |
| Animals | | | | | | | | | | |
| Cultivation | Hour | 20 | | 20 | 0.75 | | 0.75 | 0.75 | 15 | 15 |
| Transport | Hour | 0 | | 0 | 0 | | 0.95 | 0.95 | 0 | 0 |
| Bags and Other | LE | | | | | | | | 24 | 24 |
| Short Term Finance | LE | | | | | | | | | |
| NET BENEFITS | | | | | | | | | 198 | -204 |

TABLE 16. WITHOUT PROJECT
ONE FEDDAN SINGLE CROP BUDGET FOR LONG BERSEEM

| | Unit | QUANTITY Total | QUANTITY Official | QUANTITY Market | FINANCIAL PRICES Average | FINANCIAL PRICES Official | FINANCIAL PRICES Market | ECONOMIC PRICE | Financial Value | Economic Value |
|---|---|---|---|---|---|---|---|---|---|---|
| BENEFIT | | | | | | | | | 800 | 400 |
| Grain/Fruit/Fiber | Ton | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| Fodder | Ton | 4 | 0 | 4 | 200 | 0 | 200 | 100 | 800 | 400 |
| COSTS | | | | | | | | | 292 | 631 |
| Seeds | Kg | 15 | | 15 | 1.54 | 0.03 | 1.54 | 1.54 | 23 | 23 |
| Labor | Man-day | 25 | | 25 | 4.85 | 0 | 4.85 | 4.85 | 121 | 121 |
| Water | m3 | 6000 | 6000 | | 0 | 0 | 0 | 0.05 | 0 | 300 |
| Fuel | Litre | 40 | | 40 | 0.028 | 0 | 0.028 | 0.16 | 1 | 6 |
| Electricity | Kwh | | | | | | | | | |
| Fertilizers | | | | | | | | | | |
| Nitrogen(100%) | Kg | 0 | | | | 0.31 | 1 | 0.615 | 0 | 0 |
| Potassium(100%) | Kg | | | | | | | | | 0 |
| Phosphate(100%) | Kg | | | | | | | | | 0 |
| Foliar | Kg | 0 | | | | 3 | 5 | 3 | 0 | 0 |
| Manure | m3 | 0 | | | | 0 | 2.5 | 2.5 | 0 | 0 |
| | | | | | | 0 | 0 | 0 | 0 | 0 |
| Chemicals | | | | | | 0 | 0 | 0 | 0 | 0 |
| Fungicides | Litre | 0 | | | | 0 | 0 | 0 | 0 | 0 |
| Insecticides | Litre | 0 | | | | 0 | 0 | 0 | 0 | 0 |
| Herbicides | Litre | 0 | | | | 0 | 0 | 0 | 0 | 0 |
| Other | Litre | 0 | | | | 0 | 0 | 0 | 0 | 0 |
| Machinery | | | | | | | | | | |
| Tractor | Hour | 2 | | 2 | 5.5 | | 5.5 | 9 | 11 | 18 |
| Pumpset | Hour | 40 | | 40 | 2 | | 2 | 2 | 79 | 79 |
| Transportation | Hour | 3 | | 3 | 10.2 | | 10.2 | 19 | 31 | 57 |
| Planting Drill | Hour | 0 | | | | 0 | 0 | 0 | 0 | 0 |
| Sprayer | Hour | 0 | | | | 8 | 0 | 0 | 0 | 0 |
| Otrer Applicator | Hour | 0 | | | | 0 | 0 | 0 | 0 | 0 |
| Other Aplicator | | | | | | | | | | |
| Animals | | | | | | | | | | |
| Cultivation | Hour | 20 | 0 | 20 | 0.75 | 0 | 0.75 | 0.75 | 15 | 15 |
| Transport | Hour | 0 | 0 | | 0 | 0 | 0.95 | 0.95 | 0 | 0 |
| Bags and Other | LE | | | | | | | | 11 | 11 |
| Short Term Finance | LE | | | | | | | | | |
| NET BENEFITS | | | | | | | | | 508 | -231 |

TABLE 1H. WITHOUT PROJECT
ONE FEDDAN SINGLE CROP BUDGET FOR BROADBEANS

| | Unit | QUANTITY Total | QUANTITY Official | QUANTITY Market | FINANCIAL PRICES Average | FINANCIAL PRICES Quota | FINANCIAL PRICES Market | ECONOMIC PRICE | Financial Value | Economic Value |
|---|---|---|---|---|---|---|---|---|---|---|
| BENEFIT | | | | | | | | | 512 | 661 |
| Grain/Fruit/Fiber | Ton | 1.12 | 0 | 1.12 | 367 | 0 | 367 | 500 | 411 | 560 |
| Fodder | Ton | 1.26 | 0 | 1.26 | 80 | | 80 | 80 | 101 | 101 |
| COSTS | | | | | | | | | 317 | 572 |
| Seeds | Kg | 8.5 | 7.5 | 1 | 4.852941 | 3.5 | 15 | 0.3 | 41 | 3 |
| Labor | Man-day | 30 | | 30 | 4 | 0 | 4 | 4.85 | 120 | 146 |
| Water | m3 | 4500 | 4500 | | 0 | 0 | 0 | 0.05 | 0 | 225 |
| Fuel | Litre | 30 | | 30 | 0.028 | 0 | 0.028 | 0.16 | 1 | 5 |
| Electricity | Kwh | | | | | | | | | |
| Fertilizers | | | | | | | | | | |
| Nitrogen(100%) | Kg | 15 | 15 | | 0.31 | 0.31 | 1 | 0.615 | 5 | 9 |
| Potassium(100%) | Kg | | 24 | | ERR | 0.13 | 0.47 | 0.657 | 0 | 0 |
| Phosphate(100%) | Kg | | 30 | | ERR | 0.23 | 0.44 | 0.77 | 0 | 0 |
| Foliar | Kg | 1 | 1 | | 3 | 3 | 5 | 3 | 3 | 3 |
| Manure | Load | | | | | | | | | |
| Chemicals | | | | | | | | | | |
| Fungicides | Litre | 0 | | | | | | | | |
| Insecticides | Litre | 0 | | | | | | | | |
| Herbicides | Litre | 0 | | | | | | | | |
| Other | Litre | 0 | | | | | | | | |
| Machinery | | | | | | | | | | |
| Tractor | Hour | 7 | | 7 | 5.5 | | 5.5 | 9 | 39 | 63 |
| Pumpset | Hour | 30 | | 30 | 2 | | 2 | 2 | 59 | 59 |
| Transportation | Hour | 2.2 | | 2.2 | 5 | | 5 | 9.5 | 11 | 21 |
| Planting Drill | Hour | | | | | | | | | |
| Sprayer | Hour | | | | | | | | | |
| Other Applicator | Hour | 0 | | | | | | | | |
| Other Aplicator | | | | | | | | | | |
| Animals | | | | | | | | | | |
| Cultivation | Hour | 15 | | 15 | 0.75 | | 0.75 | 0.75 | 11 | 11 |
| Transport | Hour | 15 | | 15 | 0.95 | | 0.95 | 0.95 | 14 | 14 |
| Bags and Other | LE | | | | | | | | 13 | 13 |
| Short Term Finance | LE | | | | | | | | | |
| NET BENEFITS | | | | | | | | | 195 | 89 |

TABLE 2. FINANCIAL ANALYSIS OF THE NARP PROJECT
(ALL FIGURES IN THOUSANDS LE)

EXPECTED AREA COVERED BY THE PROJECT 4500 FEDDANS

| | YEAR1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **WITHOUT PROJECT** | | | | | | | | | | |
| BENEFITS | 4770872 | 4770872 | 4770872 | 4770872 | 4770872 | 4770872 | 4770872 | 4770872 | 4770872 | 4770872 |
| TOTAL COSTS | 2851062 | 2851062 | 2851062 | 2851062 | 2851062 | 2851062 | 2851062 | 2851062 | 2851062 | 2851062 |
| Farm Costs | 2851062 | 2851062 | 2851062 | 2851062 | 2851062 | 2851062 | 2851062 | 2851062 | 2851062 | 2851062 |
| Project costs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| USAID | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| GOE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NET BENEFITS | 1919810 | 1919810 | 1919810 | 1919810 | 1919810 | 1919810 | 1919810 | 1919810 | 1919810 | 1919810 |
| INCREMENTAL NB | | | | | | | | | | |
| **WITH REASEARCH, TECH, SEED AND INI.** | | | | | | | | | | |
| SHARE OF LAND WITH NEW TECH | 0.00 | 0.05 | 0.10 | 0.15 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 |
| SHARE OF LAND WITH OLD TECH | 1.00 | 0.95 | 0.90 | 0.85 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 |
| BENEFITS | 4770872 | 4844990 | 4919107 | 4993225 | 5067342 | 5067342 | 5067342 | 5067342 | 5067342 | 5067342 |
| TOTAL COSTS | 2983995 | 3066907 | 2997164 | 2963606 | 2935056 | 2926133 | 2851062 | 2851062 | 2851062 | 2851062 |
| Farm Costs | 2851062 | 2851062 | 2851062 | 2851062 | 2851062 | 2851062 | 2851062 | 2851062 | 2851062 | 2851062 |
| Project costs | 132933 | 215844 | 146102 | 112543 | 83994 | 75071 | | | | |
| USAID | 99222 | 146857 | 95088 | 66867 | 48354 | 38512 | | | | |
| GOE | 18704 | 14355 | 16071 | 20500 | 24860 | 26510 | | | | |
| NET BENEFITS | 1786877 | 1778083 | 1921943 | 2029619 | 2132286 | 2141209 | 2216280 | 2216280 | 2216280 | 2216280 |
| INCREMENTAL NB | -132933 | -141727 | 2133 | 109809 | 212476 | 221399 | 296470 | 296470 | 296470 | 296470 |
| **WITH REASEARCH, TECH, SEED, INI.AND POL.** | | | | | | | | | | |
| SHARE OF LAND WITH NEW TECH | 0.00 | 0.05 | 0.10 | 0.15 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 |
| SHARE OF LAND WITH OLD TECH | 1.00 | 0.95 | 0.90 | 0.85 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 |
| BENEFITS | 4770872 | 4873218 | 4975564 | 5077910 | 5180256 | 5180256 | 5180256 | 5180256 | 5180256 | 5180256 |
| TOTAL COSTS | 2994835 | 3099608 | 3041196 | 3022045 | 3069762 | 2997742 | 2917908 | 2917908 | 2917908 | 2917908 |
| Farm Costs | 2851062 | 2867774 | 2884485 | 2901197 | 2917908 | 2917908 | 2917908 | 2917908 | 2917908 | 2917908 |
| Project costs | 143772 | 231834 | 156710 | 120848 | 91854 | 79834 | | | | |
| USAID | 107613 | 161313 | 104113 | 73564 | 54452 | 41463 | | | | |
| GOE | 21153 | 15888 | 17655 | 22108 | 26622 | 28422 | | | | |
| NET BENEFITS | 1776038 | 1773611 | 1934369 | 2055865 | 2170494 | 2182515 | 2262348 | 2262348 | 2262348 | 2262348 |
| INCREMENTAL NB | -143772 | -146199 | 14559 | 136055 | 250684 | 262705 | 342538 | 342538 | 342538 | 342538 |

SUMMARY OF FINANCIAL ANALYSIS

| | | WITH REASEARCH, TECH, SEED AND INI. | | WITH REASEARCH, TECH, SEED, INITISTIVES AND POLICY |
|---|---|---|---|---|
| NET PRESENT VALUE W/r= | 0.12 | 528575 | 0.12 | 654353 |
| TOTAL BENEFITS | | 49932246 | | 50779101 |
| TOTAL COSTS | | 29277110 | | 29836818 |
| BENEFIT/COST | | 1.71 | | 1.70 |
| IRR WITH GUESS= | 1.00 | 0.406507 | 0.50 | 0.445595 |

Notes: Exchange rate LE 2.2 per US dollar

NET BENEFI

TABLE 3. ECONOMIC ANALYSIS OF THE HARP PROJECT
(ALL FIGURES IN THOUSANDS LEI

AG. LAND AREA EXPECTED AREA COVERED BY THE PROJECT 4500 FEDDANS

| YEAR: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **WITHOUT PROJECT** | | | | | | | | | | |
| BENEFITS | 7241913 | 7241913 | 7241913 | 7241913 | 7241913 | 7241913 | 7241913 | 7241913 | 7241913 | 7241913 |
| TOTAL COSTS | 5647709 | 5647709 | 5647709 | 5647709 | 5647709 | 5647709 | 5647709 | 5647709 | 5647709 | 5647709 |
| Farm Costs | 5647709 | 5647709 | 5647709 | 5647709 | 5647709 | 5647709 | 5647709 | 5647709 | 5647709 | 5647709 |
| Project costs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| USAID | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| GOE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NET BENEFITS | 1594204 | 1594204 | 1594204 | 1594204 | 1594204 | 1594204 | 1594204 | 1594204 | 1594204 | 1594204 |
| INCREMENTAL NB | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **WITH REASEARCH, TECH, SEED AND INI.** | | | | | | | | | | |
| SHARE OF LAND WITH NEW TECH | 0.00 | 0.05 | 0.10 | 0.15 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 |
| SHARE OF LAND WITH OLD TECH | 1.00 | 0.95 | 0.90 | 0.85 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 |
| BENEFITS | 7241913 | 7348127 | 7454341 | 7560555 | 7666769 | 7666769 | 7666769 | 7666769 | 7666769 | 7666769 |
| TOTAL COSTS | 5780642 | 5863554 | 5793811 | 5760253 | 5731703 | 5722780 | 5647709 | 5647709 | 5647709 | 5647709 |
| Farm Costs | 5647709 | 5647709 | 5647709 | 5647709 | 5647709 | 5647709 | 5647709 | 5647709 | 5647709 | 5647709 |
| Project costs | 132933 | 215844 | 146102 | 112543 | 83994 | 75071 | 0 | 0 | 0 | 0 |
| USAID | 99222 | 144857 | 95000 | 66867 | 48354 | 38612 | 0 | 0 | 0 | 0 |
| GOE | 18704 | 14355 | 16071 | 20500 | 24860 | 26510 | 0 | 0 | 0 | 0 |
| NET BENEFITS | 1461271 | 1484573 | 1660530 | 1800302 | 1935066 | 1943989 | 2019060 | 2019060 | 2019060 | 2019060 |
| INCREMENTAL NB | -132933 | -109630 | 66326 | 206099 | 340862 | 349785 | 424856 | 424856 | 424856 | 424856 |
| **WITH REASEARCH, TECH, SEED, INI.AND POL.** | | | | | | | | | | |
| SHARE OF LAND WITH NEW TECH | 0.00 | 0.05 | 0.10 | 0.15 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 |
| SHARE OF LAND WITH OLD TECH | 1.00 | 0.95 | 0.90 | 0.85 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 |
| BENEFITS | 7241913 | 7454399 | 7666886 | 7879372 | 8091858 | 8091858 | 8091858 | 8091858 | 8091858 | 8091858 |
| TOTAL COSTS | 5791482 | 5597158 | 5239649 | 4921401 | 4610022 | 4590001 | 4518168 | 4518168 | 4518168 | 4518168 |
| Farm Costs | 5647709 | 5345324 | 5082938 | 4800553 | 4518168 | 4518168 | 4518168 | 4518168 | 4518168 | 4518168 |
| Project costs | 143772 | 231834 | 156710 | 120848 | 91854 | 79834 | 0 | 0 | 0 | 0 |
| USAID | 107613 | 161313 | 104113 | 73564 | 54452 | 41463 | 0 | 0 | 0 | 0 |
| GOE | 21153 | 15000 | 17655 | 22108 | 26622 | 28422 | 0 | 0 | 0 | 0 |
| NET BENEFITS | 1450432 | 1857242 | 2427237 | 2957971 | 3481836 | 3493857 | 3573690 | 3573690 | 3573690 | 3573690 |
| INCREMENTAL NB | -143772 | 263038 | 833033 | 1363767 | 1887632 | 1899653 | 1979487 | 1979487 | 1979487 | 1979487 |

SUMMARY OF ECONOMIC ANALYSIS

| | | WITH REAS | H, TECH, SEED AND INI. | | WITH REASEARCH, TECH, SEED, INITIATIVES AND POLICY |
|---|---|---|---|---|---|
| NET PRESENT VALUE N/r= | 0.12 | 996504 | | 0.12 | 6620541 |
| TOTAL BENEFITS | | 75405550 | | | 78793717 |
| TOTAL COSTS | | 57243500 | | | 48830382 |
| BENEFIT/COST | | 1.32 | | | 1.61 |
| IRR WITH GUESS= | 1.00 | 0.63271 | | 3.50 | 3.07813 |

514

TABLE 4. SIMULATIONS WITH ALTERNATIVE ASSUMPTIONS FOR THE KEY VARIABLES
(NPV IN 000)

| | FINANCIAL ANALYSIS | ECONOMIC ANALYSIS | ASSUMPTIONS | |
|---|---|---|---|---|
| **BASIC CASE** | | | | |
| With Res, Tech, Seed & Ini | | | BASIC CASE | |
| NPV w/r=.12 | 520,574.51 | 996,503.61 | Project Area(000) | 4500 Feddans |
| Benefit/Cost | 1.71 | 1.32 | Max Adoption rate | 0.2 |
| IRR | 0.41 | 0.63 | Increase in Yield | 0.3 |
| Inclusive of Policy | | | | |
| NPV w/r=.12 | 654,353.26 | 4,620,540.92 | | |
| Benefit/Cost | 1.70 | 1.61 | | |
| IRR | 0.45 | 3.08 | | |
| **ALTERNATIVE I** | | | ASSUMPTIONS | |
| With Res, Tech, Seed & Ini | | | ALTERNATIVE I | |
| NPV w/r=.12 | 168,393.38 | 480,346.12 | Project Area(000) | 3000 Feddans |
| Benefit/Cost | 1.68 | 1.31 | Max Adoption rate | 0.2 |
| IRR | 0.22 | 0.38 | Increase in Yield | 0.3 |
| Inclusive of Policy | | | | |
| NPV w/r=.12 | 283,203.53 | 4,215,661.96 | | |
| Benefit/Cost | 1.68 | 1.60 | | |
| IRR | 0.25 | 2.00 | | |
| **ALTERNATIVE II** | | | ASSUMPTIONS | |
| With Res, Tech, Seed & Ini | | | ALTERNATIVE II | |
| NPV w/r=.12 | 1,189,462.73 | 2,020,810.59 | Project Area(000) | 4500 Feddans |
| Benefit/Cost | 1.75 | 1.36 | Max Adoption rate | 0.2 |
| IRR | 0.72 | 1.11 | Increase in Yield | 0.5 |
| Inclusive of Policy | | | | |
| NPV w/r=.12 | 1,373,503.24 | 7,890,971.18 | | |
| Benefit/Cost | 1.75 | 1.67 | | |
| IRR | 0.75 | 3.66 | | |
| **ALTERNATIVE III** | | | ASSUMPTIONS | |
| With Res, Tech, Seed & Ini | | | ALTERNATIVE III | |
| NPV w/r=.12 | 931,781.01 | 1,431,013.64 | Project Area(000) | 4500 Feddans |
| Benefit/Cost | 1.73 | 1.34 | Max Adoption rate | 0.3 |
| IRR | 0.49 | 0.71 | Increase in Yield | 0.3 |
| Inclusive of Policy | | | | |
| NPV w/r=.12 | 1,004,675.08 | 8,645,000.32 | | |
| Benefit/Cost | 1.73 | 1.76 | | |
| IRR | 0.53 | 3.10 | | |

TABLE5. PROJECT COSTS IN 000
(Dollars or Egyptian Pounds as Specified)

| | YEAR1 | 2 | 3 | 4 | 5 | 6 | LIFE OF TOTAL |
|---|---|---|---|---|---|---|---|
| RESEARCH | | | | | | | |
| USAID | | | | | | | |
| Dollar Expenditures | 16821 | 34721 | 21153 | 12026 | 11141 | 7224 | 103,086 |
| Dollars for LE Exp. | 17553 | 16100 | 14323 | 12542 | 5492 | 4905 | 70,915 |
| GOE Dol. Contribution | 7284 | 5514 | 5920 | 7508 | 9085 | 9689 | 45,000 |
| TOTAL RESEARCH IN LE | 91648 | 123937 | 91071 | 70567 | 56580 | 48000 | 481,802 |
| TECHNOLOGY TRANSFER | | | | | | | |
| USAID | | | | | | | |
| Dollar Expenditures | 3639 | 8739 | 3343 | 1482 | 1049 | 808 | 19,060 |
| Dollars for LE Exp. | 7088 | 7193 | 4403 | 4344 | 4297 | 4614 | 31,939 |
| GOE Dol. Contribution | 1218 | 1011 | 1385 | 1810 | 2215 | 2361 | 10,000 |
| TOTAL TECH TRANS IN LE | 21279 | 37275 | 20088 | 16799 | 16634 | 17123 | 134,198 |
| SEED AND NEW INITIATIVES | | | | | | | |
| USAID | | | | | | | |
| Dollar Expenditures | 3054 | 19776 | 13155 | 8362 | 1736 | 1144 | 47,227 |
| Dollars for LE Exp. | 1279 | 3079 | 541 | 592 | 335 | 350 | 6,176 |
| GOE Dol. Contribution | 2488 | 1978 | 2187 | 2490 | 2829 | 3028 | 15,000 |
| TOTAL IN LE | 15006 | 54633 | 34943 | 25177 | 10780 | 9948 | 150,487 |
| RESR+TECH+SEED IN LE | 132933 | 215844 | 146102 | 112543 | 83994 | 75071 | 766,487 |
| POLICY ANALYSIS | | | | | | | |
| USAID | | | | | | | |
| Dollar Expenditures | 2367 | 5081 | 2775 | 1816 | 1435 | 467 | 13,941 |
| dollars for LE Exp. | 1447 | 1490 | 1327 | 1228 | 1337 | 829 | 7,658 |
| GOE Dol. Contribution | 1113 | 697 | 720 | 731 | 801 | 869 | 4,931 |
| TOT POL ANALYSIS IN LE | 10839 | 15990 | 10608 | 8305 | 7861 | 4763 | 58,366 |
| TOT OF 3 COMP IN LE | 143772 | 231834 | 156710 | 120848 | 91854 | 79834 | 824,853 |

# SOCIAL SOUNDNESS ANALYSIS

## NARP PROJECT PAPER AMENDMENT NO. 2/(263-0152)

## I. INTRODUCTION

This analysis draws on a set of interviews held during 1986 with EMCIP/CID contract staff regarding problems of extension and technology transfer to women and an interview in Menofiyia with the Chairman of PBDC in the fall of 1987. It also draws rather substantively on the World Bank's 1985 evaluation of its experience with support to research and extension in Africa and Asia as well as on the 1987 AID/W assessment of its experience with agricultural extension. It also benefits from use of USAID/AGR generated documents and discussions with AGR project officers.

## II. PURPOSE

The purpose of this analysis is to focus attention on potential beneficiary targets and on the anticipated impact of USAID support to a research and extension process over the next five years.

The technology transfer service performs such functions as informing farmers of the existence of improved technological components and processes; making these available to potential users; and assisting them in learning how to take advantage of improved production practices.

Technology transfer is a process with multiple functions. These include information, teaching, technology supply and technology service. These functions can be performed by the same organization, or by separate organizations, as long as their complementarity is preserved, their separate objectives are understood.

Agricultural extension is primarily concerned with the information and teaching functions of technology transfer. It is the communication link between farmers and all those involved in developing and improving technological packages.

Existing weaknesses in the GOE's research and extension institutions are acknowledged in the project description. Constraints such as weak dissemination of technologies to farmers and lack of mechanisms for linkages with other service delivery entities are pointed out. Consequently, it might be realistic to adopt a phased approach to support for extension in the face of existing weak institutions. This issue seems particularly important in light of the fact that the GOE (according to the Five Year Plan) plans to continue working through centrally directed research and extension institutions while USAID would like to introduce a more decentralized approach.

Once extension has been transferred into the ARC, the new role and functions of extension will have to be determined. Agricultural extension has historically been perceived as a function of low status performed by poorly qualified and poorly equipped persons who deal with poor and, frequently, illiterate farmers in remote rural areas. This perception is, more often than not, grounded in reality. Salaries are low, job descriptions are unclear, quality of performance is poor, and supervision of that performance is often non-existent.

## III. SOCIOCULTURAL FEASIBILITY

### A. Compatibility of Project Objectives

The sociocultural feasibility of this project concerns the compatibility of project objectives with the existing research and extension environment into which it will be introduced. The environment in which research is currently conducted and disseminated in Egypt is fragile. It is characterized by weak research institutions and limited technology to extend. For example, the project description makes the point that "ARC conducted research activities experience a series of management, programming, and financial management problems. Much of the funding for ARC research is not prioritized nor allocated based on highest national development goals."

Consequently, trying to fold 10 existing ARC experiment stations (it will take time for each station to go through the process of being "converted into research/extension centers") and 20 governorates into the project's technology transfer process by 1993 will tax the existing research apparatus beyond its capacity to realistically achieve this objective. Proceeding at a more modest implementation pace of say, one research station per year, beginning in 1989, in order to come up with a model that works and can be replicated in other governorates, will provide a better opportunity to determine the impact of USAID's investment.

An attempt to spread a technology process over 20 governorates before we know whether or not it will work in one governorate would not be practical. This means that by the PACD, implementation would have taken place in perhaps 10 rather than in 20 governorates.

## B. ARC and Extension Employees as a Target Group

The original ARC mandate included the extension function. Currently this function is under an Undersecretary of Agriculture. Under a Ministerial Decree, 7,000 extension employees are to be officially transferred back to the ARC. Although this is slated to be a paper move, not a physical move, transferring such a massive number of employees will require a lot of planning, and numerous changes in institutional relationships. For example, what will be the status of the Undersecretary who now has authority for the extension function? How will job descriptions change for all these employees? Will subject matter specialists be selected from among these employees or from among research employees? Will the salary and incentive structure for these employees change at all?

In the World Bank's experience, subject matter specialists may be the most difficult group within the research and extension system to train and keep in place. First, these specialists need a strong technical background, including some research experience, to enable them to fully understand research findings and output. Second, they need to be experienced production specialists who can grow a crop and understand the problems faced by farmers.

Although these specialists need this combination of valuable skills, in the past they have generally been assigned to an extension organization that more than likely had a lower status and a lower salary schedule than research.

These specialists will require attention. The Bank found, for example, that subject matter specialists in Thailand and Indonesia were overburdened -- with administering extension programs and training field-level agents -- to the point where they could not perform their functions as the link between research and extension. This led several project leaders in Indonesia and Thailand to question the need for large numbers of field-level extension workers. They suggested that well-trained, highly motivated, well-equipped, and mobile subject matter specialists could assume full responsibility for extension and do a much better job.

Problems faced by farmers, especially the most advanced among them, were often too complex for a poorly trained field-level extension worker to analyze, dissect, comprehend, and transmit to researchers. This extension worker would have difficulty understanding complex technological innovations and teaching farmers how to use them.

The 7,000 extension employees represent a key beneficiary target under this project. Exactly how or if such a number of people will be reached should be addressed within the start-up phase of the research and extension component.

USAID and the ARC Director should work out a plan to determine how USAID's investment will selectively target and strengthen certain categories of extension employees for training and upgrading of skills and certain categories of extension functions for resource inputs.

## C. Motivation and the Incentive System

This project can improve the human resources of research and extension only on the margin. The deeper systems problem of an overstaffed, undertrained, and poorly focused extension system out of touch with farmers and researchers cannot be dealt with in this phase. This project cannot turn around a long entrenched institution over the next five years. This project cannot address the underutilization of over 7,000 government employees. Nor can this project tackle the long-run incentives problem. Salary scale and allowances are set by the civil service. The provision for improving salaries across the board or on the basis of performance will be limited to short-run project funding unless the Ministry of Agriculture is in the process of programming a budget that will cover this type of recurrent cost. Consequently, sustainability of any improvements in performance beyond the LOP seems problematic.

The current investment period of this project is not long enough to determine that sustainability will have occurred at the PACD. However, it will be possible to identify some indicators of potential for sustainability. For example, two indicators that the GOE is committed to research and extension would be demonstrated by (1) a shift from USAID funds to local funds to continue the strengthening of research and extension; and (2) continued diffusion of the technology transfer process into all governorates.

Measures for these indicators could be incorporated in the monitoring and evaluation plan.

## IV. SPREAD EFFECTS: THE DIFFUSION OF INNOVATION

The "Supreme Council for Agricultural Extension and the Governorate Extension Councils, with representation of farmers and other non-public extension entities" will be the primary catalyst for diffusion of the technology transfer process into the governorates. Project management will need to determine how the different interests of these groups will work toward or against diffusion. For example, are farmers really being drawn into the process? And what farmers? The wealthier and more influential ones? Or a cross-representation of farmers?

In the Bank's experience, attempts at improving top-down extension were concentrated on encouraging the establishment of internal feedback channels within extension services. This was accomplished through regular contacts between extension workers and farmers. This mechanism, although an important step in the right direction, still left farmers at the mercy of the extension agent's willingness, motivation, and capability to comprehend the problems of farmers and transmit them to the research units. One way that farmers could respond would be through more active attempts to look after their own interests. For example, water users organizations might provide a vehicle for farmers to lobby for their own interests.

### Leadership and Influence in Extension Delivery

The most commonly used extension delivery programs favor large, wealthy, and politically powerful farmers whose influence guarantees them access to the extension service, and whose resources enable them to undertake innovations in agricultural production. Observations made during the Bank evaluation indicated that small farmers, in general, and women, in particular, had the least say on either the form or the substance of extension.

#### A. Large Farmers/Small Farmers and Diffusion

Although the project should make a concerted effort to facilitate access to technology by small farmers, farmers with medium to large feddan holdings generally have some leadership role and influence in their communities. They are listened to by small farmers who generally have little or no influence or privileged access to information and other resources. Large farmers are not only listened to but their production practices are imitated by small farmers -- more to the point, once new practices have been shown to work for the large farmer, the small farmer is willing to adopt the practice. The small farmer is more vulnerable to risk than the large farmer who can better afford to take the risk of adopting a new or different production practice.

Consequently, large farmers represent one of the most effective indigenous channels for diffusion of any innovation in a technology transfer process.

Project management should selectively seek out farmers who are influential leaders in their communities. They can be among the most effective communications agents in diffusing a new technology.

### B. Women and Extension

An impressive thrust of this project is the commitment of the GOE to improving the access that women have to extension. A statement of this commitment comes from the level of the Minister of Agriculture's office, which has insisted that the work begun in the Egyptian Major Cereals Improvement Program (EMCIP) on the role of women in agriculture will continue in the NARP.

There are two sets of target groups -- female extension workers and female farmers. This project should continue the direct involvement with women in extension in Gharbiya and Minya governorates. These are the governorates in which EMCIP has already made inroads.

Women extension agents should be selected for project assistance out of the 7,000 extension employees who will be transferred to the ARC. Women farmers should be involved in on-farm trials and demonstrations where they can obtain new agricultural technology through a direct approach.

Women's participation in and benefits from the project should be among the indicators measured in the project evaluation plan.

## V. SOCIAL CONSEQUENCES AND BENEFIT INCIDENCE

Project management should develop a set of criteria to measure the differential social impact of USAID's investment over the remaining five years of this project. Key target groups will be affected in very different ways. One of the first tasks of project staff will be to identify who these key target groups will be. For example, which categories in the research units and the extension service will be designated for special training? What will be the basis for their selection? How will existing farmer groups such as water user associations be integrated into the governorate planning process? What will be the mechanism for improving coordination between the MOI and MALR regarding water use practices?

A. Differential Social Impact

Differential social impact should be measured during implementation for each of the key target groups. This tool for getting at impact should be incorporated into the overall project monitoring and evaluation plan.

Project management will be called upon at various points to provide both quantitative and qualitative data and information on which groups, including women, are benefiting from specific project inputs -- training, improved research facilities, etc. Project staff should systematically collect the kind of data that will provide both USAID and GOE management with information indicating impact.

B. Changes in Institutional Relationships and Participation

This project assumes numerous changes in institutional relationships. For example, a reorientation of ARC, including the transfer of 7,000 employees, will result in many changes in long standing relationships. The extent to which these changes might stall implementation at critical points should be examined by project management. Issues regarding new or revised roles and functions should be identified and cleared up. For example, how will extension be incorporated into the existing authority structure of the ARC?

This project also assumes numerous linkages within the government as well as with private sector entities. "A wide variety of intermediary groups outside the public extension service will be involved in this project. These include mass media organizations, cooperatives, village banks, farmers associations, schools, companies, and PVOs." Many of these linkages are at present non-existent. Making sure that these linkages are first of all established and then maintained will require a great deal of communications and group dynamics skills.

Consequently, the project should enlist staff with the time and skills required to establish and nurture these linkages.

Along these same lines the participation of representatives of farmer groups should be actively sought. This might also require the help of staff skilled in communications aside from the extension officers or subject matter specialists.

## Bibliography

Berger, Marguerite, et al. "Bridging the Gender Gap in Agricultural Extension," AID/PPC/WID, September 1984.
1984

Bremer, Jennifer. "Comparative AID Vantage," Foreign Service Journal, July/August 1986.
1986

Britan, Gerald. "Innovative Approaches to Agricultural Extension." An Overview of AID Experience, AID/PPC/CDIE, May 1987.
1987

World Bank. "Agricultural Research and Extension." An Evaluation of the World Bank's Experience.
1985

AGENCY FOR INTERNATIONAL DEVELOPMENT

Washington, D. C. 20523

004220

PROJECT PAPER
AMENDMENT #2
ANNEX M

EGYPT: National Agricultural
Research (263-0152)

August 22, 1988

# Component II

## Table of Contents

## Agricultural Policy and Statistical Component


| | Page |
|---|---|
| I. COMPONENT BACKGROUND, PROBLEM STATEMENT, RATIONALE AND STRATEGY | 4 |
| A. Background | 4 |
| B. Problem Statement | 6 |
| C. Component Rationale | 8 |
| D. Component Strategy | |
| E. Lessons Learned | 10 |
| F. Relationship to USAID Development Assistance Strategy | 12 |
| G. Institutional Setting | 13 |
| H. Prior Project Experience | 16 |
| II. COMPONENT DESCRIPTION | 17 |
| A. General Statement, Goal and Purpose | 17 |
| 1. Goal | 18 |
| 2. Component's Purpose | 18 |
| B. Description of Component Elements | 19 |
| 1. Background | 19 |
| 2. Strengthening Ag. Economic and Policy Analysis Function | 20 |
| 3. Strengthening Linkages to Facilitate Policy Dialogue | 25 |

4. Statistical Analysis and Data Processing Services 27
5. Information Support Center 38
6. End of Project Status - Agr. Policy Analysis Component 41

IV. IMPLEMENTATION, CONTRACTING, FINANCIAL, EVALUATION & TRAINING PLAN 41

A. Implementation Plan and Schedule 41
B. Contracting Plan 47

1. Contracting Methods 47
2. USDA PASA 48
3. Generic PASA 49
4. Host Country Personal Service Contracts 49
5. Other U.S. Contracts 49
6. Commodities 49
7. In-country Seminar 50

C. Cost Estimates and Financial Plan 50

1. Chart on Methods of Implementation and Financing 57
2. Local Cost Financing and the Annual Work and Financial Plan 57
3. Recurrent Cost Issues 57

D. Monitoring and Evaluation Plan 60

1. First Evaluation, Oct-Nov 1990 62
2. Final Evaluation, 1993 63
3. Implementation of Evaluations 64

VI. TRAINING PLAN 64

A. In-Country Technical Training Activities 65
B. Specialized Short-term Training 66
C. Long-term External Degree Training 66

2. The Economic and Policy Analysis Services

   (a) Sectorlicy Monitoring System
   (b) Economic and Policy Studies
   (c) Quick Response Decision Support

3. Information Dissemination Services

   (a) Statistical Information and Data Services
   (b) Economic Information

## II. INPUTS, COST ESTIMATE AND FINANCIAL PLAN

A. Overall Cost Estimate and Financial Plan
B. Major Inputs
C. Methods of Implementation and Finance
D. Recured Cost Issues

## III. IMPLEMENTATION PLAN

A. Major Responsibilities
B. Contracting Modes and Contractor Responsibilities
C. Local Cost Financing (Services) and the Role of the Annual Work and Financial Plan
D. Implementation Schedule

## IV. MONITORING AND EVALUATION PLAN

## V. SUMMARY OF ANALYSIS

A. Technical Consideration
B. Economic Consideration
C. Administrative Assessment

AGRICULTURAL POLICY ANALYSIS COMPONENT

## I. COMPONENT BACKGROUND, PROBLEM STATEMENT, RATIONALE AND STRATEGY

Egypt's policy level officials are presently and will be for several years to come under constant pressure to make critical policy decisions on an urgent basis. Some of the most urgent economic and socio-political issues are within the agricultural sector. Too frequently these issues and problems need almost immediate response and too frequently little if any precedents, based on Egyptian experience, are available to provide guidance. To add to this problem there is meager policy analysis capability to staff out, evaluate, and prepare policy briefing papers for those who must make the decisions. Technical staff are not generally available to add important information, make objective recommendations or to assist top level officials to fully consider alternatives and consequences. This component addresses this deficiency in the Ministry of Agriculture and Land Reclamation and provides the means to rectify it.

### A. Background

Agriculture is a primary production sector of the Egyptian economy. It accounts for more than 20 percent of Egypt's total GDP. Over 36 percent of the labor force is employed in the sector. Unfortunately, average incomes in the agriculture sector are substantially lower than in the rest of Egypt's economy therefore not providing equal incentives to increase work efforts. Continued high population growth increasingly strains limited arable land and water resources. Trade-offs between domestic food and export production are becoming critical and have only recently gained attention at the policy level.

Prior to the land and political reforms of the 1950s, Egypt's agricultural economy was largely private. Large and small producers made farming and marketing decisions based on economic opportunities and their individual profit calculations. Following the land reforms of the 1950s, state-dominated cooperatives assumed the large-landowner role on formerly tenanted land. The policy objectives of the government's decision for change and reforms were two-fold: (1) to gain revenues and supplies of raw materials for industrialization of the economy, and (2) to attempt to achieve more equity in social and economic benefits. This resulted in mandatory cropping patterns being laid down by the central government, even for small land holders not directly affected by the land reforms. A complex system of area controls, output quotas, administered prices, and subsidized state distribution of inputs evolved.

The mandatory cropping patterns and rotations facilitated the adoption of improved plant protection and irrigation practices but the system also took many of the farm management decisions away from farmers and gave them to cooperative officials and other civil bureaucrats. In addition to

the mandatory cropping pattern, the associated type of inputs to use and levels of application were determined by government officials. These more frequently than not were at levels not consistent with economic optimums.

The quota system for inputs, requisitioned outputs, and widespread system of administered prices resulted in: (1) a heavy net taxation on agricultural production, (2) reducing the incentive to increase productivity, and (3) development of production patterns which were not in accord with economic reality. This latter is true most certainly where the farmers were concerned. Public sector production and resource allocation policies were frequently based on inappropriate or traditional technological information and the Government of Egypt's (GOE) need for revenue, foreign exchange, and keeping consumer food prices low. Little attention was paid to the distortions in efficiency, growth, and equity effects on the farmers.

Historically, the GOE implemented agricultural production assistance programs aimed primarily at single crops, such as wheat, cotton, rice, and sugarcane. This narrow commodity-focused approach has achieved fairly high per-acre yields under the favorable irrigation that Egypt enjoys. However, those commodity specific programs did not consider the sector in a macro sense and neglected issues of comparative advantage, overall sector income, employment generation, food imports, and maintaining balance of payments deficit.

It is not evident that effective policy analysis and long range planning by and for decision makers, concerning policy adoption consequences, was done during the past. Although agricultural data have been collected in Egypt for centuries, timely and reliable information on the sector for evaluation of policies and their operational input are scarce. Such ad hoc and piecemeal studies that were done in the past did not result in an adequate and continuous supply of relevant policy information for decision makers.

Egypt has now entered a period of extensive and sustained policy reforms. The need for these reforms in agriculture reflect the growing per capita food deficits, very costly government food and agricultural input subsidies, stagnating controls, and burdensome public sector intervention in production and marketing activities. This new posture to support the reform process is generating increased demand by public and private entities for information adequate to assess and evaluate current policies, policy alternatives, and probable impact of alternative courses of action.

B. Problem Statement

As discussed above, the problems that the current GOE administration face to modernize and reform Egypt's agricultural policy development and evaluation methods are complex and in need of immediate attention.

The 1981 report of the Presidential Mission on Agricultural Development in Egypt entitled Strategies for Accelerating Agricultural Development stated: "...agricultural policies have acted to seriously constrain the growth of Egyptian agriculture. Prices for many agricultural commodities are fixed at low levels. This is a serious disincentive to farmers as it gives no encouragement for increasing production and actually promotes the inefficient allocation of resources and the inequitable distribution of sectoral income".

The Agricultural Policy Analysis (APA) component is designed to improve policy formulation, assessment, and evaluation of all government programs and actions affecting food and agricultural development. This starts with upgrading the assessment and decision making process by strengthening the national agriculture information base, and the analytical and process capacity of the Ministry of Agriculture and Land Reclamation (MALR). This will permit the MALR to more readily identify and address key problems, conduct studies, and evaluate and report on policy effectiveness The component design recognizes explicitly that policy formulation, leading to decisions and then implementation, monitoring and evaluation to measure results are interrelated and inter-independent.

The Government is continuing to be involved in assessing policy problems which are constraining the agricultural sector. It has recently announced the removal of all price, acreage, and production controls on all crops. A temporary time limitation excludes cotton, rice and sugarcane. The MALR (specifically the Undersecretariat for Agricultural Economics and Statistics; U/AES) is currently trying to effectively monitor, verify and assess the impact of these and other reforms. The staff, equipment and present methods are severely strained to accomplish this along with other urgent demands being put in U/AES. The MALR has requested assistance from USAID to help strengthen U/AES's policy analysis capability, sector performance monitoring, and to upgrade its overall management abilities. Some of the principal problems needing to be resolved are listed:

- Policy formulation is fragmented among ministries, policy specific committees, autonomous research institutions, universities and other public agencies. A majority of agricultural policy formulation takes place outside the MALR. Policy formulation is done within the Economic Cabinet which unites various ministries and provides a forum where issues of national, and inter-sectoral importance can be discussed. Unfortunately these decision makers are seldom appraised of the inter-related impact of decisions made.



591

- There is a need for improved national recognition of the existing identification and conceptualization of agricultural adjustment problems; more timely identification and analysis, including benefits and costs of policy options; more efficient policy rationalization, justification and evaluation; more expeditious policy decision making; and continuous monitoring and reporting to decision makers in terms of the effectiveness of the policies.

- Technical capability in conducting policy analysis is weak and fragmented within the MALR itself. Most analysis is descriptive and does not provide in-depth assessment or evaluation of policy impacts on various sub-sectors or other important factors within the agricultural sector.

- The national agricultural information base for policy analysis is weak and there is urgent need for improvement in its quality and scope. Data are difficult to assess and use due to poor compilation, organization, filing and recalling.

- There is very little coordination between the various ministries, institutions or even within the MALR and its internal organization with respect to sharing information, resources or participating in coordinated and integrated handling and analyses. There is need to strengthen the information capabilities of the MALR and establish a more cost effective systems for collecting, processing and distributing primary data and analytical results both at the Ministry as well as the governorate level.

- There is a need to strengthen the organizational structure, functional relationships, and management skills of the U/AES to improve over-all administration, supervision, coordination, program planning and implementation of its progress and project activities. The section of the U/AES for sponsoring special studies and workshops, hosting task force work, responding to the need for urgent policy paper preparations and specially requested policy staff work needs training, technical assistance and equipment.

An enhanced agricultural policy analysis capability based on an integrated statistical collection, data processing and information distribution system will make a substantial contribution towards improving performance of Egypt's agricultural sector. A more effective policy formulation process, by identifying and analyzing important issues, and predicting the qualitative and quantitative effects of alternative policies in agriculture are the responsibility of the U/AES. By improving its analytical skills, organizational administration, reporting and policy research capability will vastly improve the GOE's efforts to expand and improve productivity in agriculture.

The APA component of the NARP will support and finance a number of policy studies or task forces each year designed to address critical policy concerns or issues facing the government as well as support the monitoring and evaluation of current policy reforms being implemented by the GOE. In addition, the component will support improvements in the means and methods of the U/AES to strengthen the collection, tabulation, and publication of statistical information needed.

Senior government officials and policy makers will be invited to seminars and participate in workshops to better prepare themselves to consider and debate the various policy options presented by the policy analyst. This will equip them to make informed choices based on economic and social impact, political considerations, cost effectiveness and the policy effect.

C. Component Rationale:

The GOE is committed to redirecting the economy to a greater free market orientation and to a need for policy reforms. This requires sound policy formulation and the means for monitoring desired changes and continuing review and evaluation of expected changes.

The Agricultural Production and Credit (APC) Project, No. 263-0202, has established a number of benchmarks concerning specific policy reforms which the GOE has agreed to implement. Also, the GOE is in negotiation with the World Bank and the International Monetary Fund concerning other special policy reform packages for both the agriculture and other sectors. A number of specific policy studies by special task forces of Egyptians and U.S. specialists will be conducted and financed during the early implementation period of this component to initiate policy reform actions.

These studies will address such topics as, but not necessarily be limited to, livestock import restrictions, input marketing, impact of subsidy removal on cotton, and the removal of input subsidies on the agricultural sector. For example, the current policy reforms which the GOE is implementing include: (a) the removal of price, acreage and production controls on specific crops, (b) the reduction of input subsidies, and (c) raising input prices of the remaining controlled crops toward the world market price.

These actions will have a measurable impact on the the agricultural sector with respect to investments, employment opportunities and productivity. To measure this information on prices, input usage, acreage and production data, timely, accurate information is required by

both public and private entities. The need for information concerning the impact of these policy reforms will also be critical to political interests in order to determine the impact these reforms will have on the economy, and specifically those relating to food and the agricultural sector.

In summary, it is strongly believed that the existing internal capacity of the MALR will not allow it to perform the needed agricultural policy analysis, assessment and monitoring without technical assistance, special commodities, and training. This component comes at an opportune time as Egypt is initiating its new economic and agricultural policy reforms. The component consists of four interrelated elements which address existing constraints to improving policy analysis capabilities and its formulation within the GOE. These are strengthening the policy analytical capacity of the Economic Studies Department, U/AES; supporting the statistical and data processing services; establishment of an information support center; and establishing the way and means to conduct and sponsor related special policy studies and workshops.

D. Component Strategy:

The strategy the Mission has chosen for the design of this component focuses on assisting the MALR in assessing and evaluating the many agricultural policy reforms required to remove existing constraints to create a sound economic environment for technology transfer and expand the role of the private sector in agriculture so that the sector becomes an engine of economic growth for Egypt. This component will assist the MALR to identify and execute agricultural policy reforms through strengthening the Ministry's capability to develop key policy initiatives, to develop an agriculture information base for policy analysis and decision making, and implement the needed reform programs within a reasonable time frame. In order for rational policy development to take place, the U/AES will carry out and/or manage a number of special studies to address the necessary policy issues facing the agricultural sector. In order to carry out these studies, a good national agricultural information data base, routine data collection and processing system for policy analysis, modern state of the art analytical tools, and trained manpower are required. To respond to this challenge, the U/AES will require an organizational structure and trained personnel capable of responding to high level requests and dealing with issues at the highest policy levels.

The policy analysis process is a <u>means of</u> producing information to consider current policies, their effectiveness and deficiencies and to identify alternatives, changes or new policies needed. Policy analysis takes into account a broad spectrum of interests, i.e., social, political, economic, financial, sector impact, equity, etc.

The ultimate value of analysis may be to improve the well being of a selected target group but the proximate objective or end-in-view for the analyst is to provide information to managers and policy decision makers to help them make better decisions in allocating scarce resources within the agricultural sector.

E. Lesson Learned

The design of this component is guided by AID's past lessons learned and experiences in other agricultural policy and planning projects both within the Asia-Near East Region as well as in other regions. These are summarized as follows as well as a statement on how this component will address the lesson:

- "A focus on meeting and expanding the demand for information and policy analysis for agricultural policy decision making". This is addressed through the development of policy briefs, the sponsoring of monthly seminars, annual policy workshops and conferences summarizing the results of specific, well designed and focused policy study findings and results. Also, the demand for information will be satisfied through the establishment of an information center which will distribute and make easily accessible policy related information to both public and private organizations and firms. Furthermore, the GOE's desired change from a centrally controlled economy to a more free market economy will itself stimulate the demand for information by policy decision makers.

- "A preference for simple but rigorous, rather than complex, analytical methods". The analytical methods that will be introduced will be based around a food and commodity balance sheet approach, an agriculture sector L.P. model, farm budgets, simple regressions, and the utilization of mathematical spreadsheets to identify economic/financial and policy impacts The analytical methods will be facilitated by the use of P.C computers.

- "A preference for fast turnaround, highly focused, problem oriented studies rather than the construction of all encompassing analytical frameworks". This will be addressed through the training of a select small policy group of policy analysts in the Economic Studies Department to address, design and respond quickly to MALR policy questions. The training will focus on applied analytical procedures, methods of analysis, report preparation and utilization of secondary information sources in responding to specific and well focused policy related questions. Policy briefs will be developed and circulated to key government officials.

- "Development of a small, critical mass of highly qualified technical personnel in the public sector, to be complemented, as needed, by reliance on analytical expertise in other public institutions and the private sector". This component will encourage the exchange of information and analytical models with other public and private institutions, as well as involve outside analysts. Short- and long-term training will be financed through the consultant's general contractor to upgrade the skills and capabilities of a small group of individuals in various departments such as the Economic Studies Department, and the Statistical and Data Processing Departments. Numerous in-country training seminars for U/AES staff, AERI, University staff and private sector funds will be focused on applied analytical procedures, data analysis, and report preparation.

- "Attach higher priority to analytical work than to activities that are primarily oriented to primary data collection". The component will focus primarily on strengthening analytical process capacity of the U/AES to perform and manage policy analysis. This will include monitoring and evaluating policies currently being implemented by the GOE and the design and review of alternative policy strategies. Furthermore, the component will finance a number of specific policy related studies that will utilize existing data collected by the GOE.

- "Development of an out-reach mechanism to assure that information and results of analysis get fed into the decision making process". To address this concern, workshops, seminars, conferences, the publication of a number of statistical series, and economic papers will be produced and distributed to public and private organizations through an information support center.

- "Developing and strengthening operational linkages with other public organizations and private producers to assure that they are more than a passive appendage in the policy formulation process". This will be addressed in two ways: one, through the involvement of outside analysts and interested individuals participating in the policy studies, special task forces, seminars, workshops and conferences; and secondly, through the commodity-outlook situation program. Commodity specialists working under the commodity outlook program will communicate periodically with private producers and processors related to their respective commodities.

- "Flexibility is a critical ingredient". A special program will be established to finance a number of special policy studies or task forces related to current or newly developed policy issues. The program will be managed by a technical committee under the U/AES. The utilization of external expertise from other institutions in performing specific policy analysis will be utilized by soliciting



546

requests for proposals and funding specific, well-defined policy studies. Also, the component will fund and help sponsor other individuals from other institutions to spend time in the U/AES evaluating special policy issue.

- "A recognition that food policy analysis, formulation and implementation are highly integrated and cannot be independent from one another". There has been a lack of contact between decision makers and analysts. The component will sponsor a number of policy workshops and conferences involving senior government officials which will help bridge the gap between analysts and decision makers. Also, the involvement of the decision makers in the design of studies will be encouraged through the use of advisory or technical committees to guide specific studies or task forces.

This component does not attempt to address all the problems with respect to policy analysis or decision making. The strategy is to focus on major constraints and to establish a coherent and sound policy framework. Focus is on the key role the Undersecretariat of Agricultural Economics and Statistics, of the Ministry of Agriculture and Land Reclamation, plays in policy analysis and its formulation. Since basic micro and macro analysis is a necessary and integral part of policy analysis, other public and private institutions with primary responsibility for conducting such medium-term research analysis will receive some support through short-term technical assistance, training, short-term courses and by participating in special technical workshops and conferences related to policy analysis and data collection.

F. Relationship to USAID Development Assistance Strategy:

This component forms an integral part of the Mission's agricultural sector development strategy and Mission's overall development priorities. This component complements and is integrated with the policy reforms being implemented under the Agricultural Production and Credit Project, which is one of the agency's policy reform centerpieces, and is in conformity with the A.I.D. policy paper "Food and Agricultural Development", dated May 1982.

Furthermore, this component will capitalize on investments and development efforts made in the Data Collection and Analysis Project that was designed to improve the MALR data collection capabilities and strengthen MALR staff capabilities and other public institutions to conduct statistical and specific data analysis.

The GOE is making fundamental economic policy changes by implementing a market-led development strategy. Yet, further changes are needed. These are recognized by the GOE and have been identified within key sub-sectors. An important objective of USAID/Cairo will be to continue

its cross-sectoral policy dialogue with GOE to support policies necessary for sound, broadly-based development and growth in the agricultural sector. The Mission will assist the GOE to implement economic development by enhancing price policies and more effective use of scarce resources. Through the Agricultural Policy Analysis Component, the U/AES staff wi l be strengthened to more effectively respond and advise the Minister of Agriculture and Land Reclamation and other senior governmental officials on key policy issues. Through the U/AES, USAID will maintain a continuous dialogue on agricultural policies both with the MALR and with its dependencies (e.g., PBDAC) and with other ministries or agencies influencing agriculture sector policies. Thus, the Mission clearly perceives the need for this component. It provides an important opportunity for AID to assist the GOE in carrying out critical policy reforms designed to stimulate agriculture production, investments in the sector, and a greater role for the private sector in contributing to agricultural growth.

G. Institutional Setting

The policy analysis within the Ministry of Agriculture comes primarily from the Undersecretariat for Agricultural Economics and Statistics (U/AES). The APA component will be implemented by the U/AES. This institution has responsibility for the national agricultural statistics and sector wide economic analysis services provided generally for the policy decision making community and for the Ministry of Agriculture and Land Reclamation in particular. Formerly the U/AES was primarily a statistical unit, drawing some of its economic analysis from the Agricultural Economics Research Institute (AERI), one of several institutes of the Agricultural Research Center. In the past few years U/AES has been expanding its own economic analysis capacity while still drawing partially on personnel and upon long-term research findings from the AERI. In addition to extensive collaboration with AERI, the U/AES is increasingly building a network of university contacts along with international consultants to improve its agricultural policy analysis response capability. This network of contacts and working arrangements are expected to continue and will become more formalized. Nevertheless, the U/AES needs to develop a much better in-house agricultural agricultural policy analysis capability, one which works from an expanded, higher quality national agricultural information base.

The U/AES is a line agency of the Ministry of Agriculture and Land Reclamation and is responsible for agricultural statistics, macro-economic and policy analysis within the agricultural sector as well as other multisector issues. There are about 1400 persons in the U/AES and 38 field offices. The U/AES has eight departments responsible for: statistics; data collection, processing and storage; economic analysis and administrative matters, see figure 1. The U/AES has over 800 professional staff trained in statistics, data gathering and processing,

economic, and general agriculture disciplines. However, there is a small cadre of trained individuals (above the B.S level) in the areas of Economic, Statistics and Computer Science and Data processing. The institutional improvements required to take place over the next several years are described in the context of the component outputs in the administrative assessment section of the NARP PP. The expectation is that the functional work carried out will serve both the analytical needs for policy decision making and formulation as well as institutional development objectives for the U/AES.

**Figure 1**

UNDERSECRETARIAT FOR AGRICULTURAL ECONOMICS AND STATISTICS

- Undersecretary for Agricultural Economics and Statistics
  - Technical Office
  - General Statistics Department
  - Financial & Administrative Affairs Department
  - General Dept. for Data Processing
    1. System Analyses Dept.
    2. Programming Dept.
    3. Training Dept.
    4. Computer Operating Dept.
       - a. Main Frame Operating Dept.
       - b. Mini Computer Sectic
       - c. Gov. Computers Operating Section
    5. System Eng. Dept.
    6. Administrative Affairs Section
  - General Dept. for Economic Studies
    1. Dept. for Prod. Economics Studies
       - a. Crop Structure Studies Section
       - b. Field Crops and Horticulture Studies Section
       - c. Animal Prod. and Aquaculture Studies Section
    2. AGR Marketing Studies Dept.
       - a. AGR Marketing Section
       - b. Foreign Trade Section
    3. AGR Policy Studies
       - a. Current Status Studies Section
       - b. Future Status Studies Section
       - c. Special Studies Section
    4. Resources Economics Studies Section
       - a. Soil Economics Section
       - b. Water Economics Section
    5. Administrative Affairs Section
  - General Dept. for Marketing Data
    1. Dept. of Demand Estimation for Production Inputs
    2. Dept. of Marketing Data
    3. Cooperative Marketing Dept.
    4. Administrative Affairs Section
  - General Dept. for Statistical Estimation by Sampling
    1. Statistical Design and Monitoring Dept.
       - a. Statistical Design Section
       - b. Experiment Implementation and Monitoring Section
    2. Dept. of Statistics for Delta Governorates
    3. Dept. of Statistics for Mid Egypt
    4. Dept. of Statistics for Upper Egypt
    5. Administrative Affairs Section
  - General Dept. for Agricultural Statistics
    1. Agriculture Production Statistics Dept
       - a. Vegetable and Fruits Statistics Section
       - b. Field Crops Statistics Section
       - c. Animal Production Statistics Section
       - d. Meteorological Statistics Section
    2. Cost of Production Prices and Wages Dept.
       - a. Production Costs Statistics Section
       - b. Price Statistics Section
       - c. Labor Force and Wages Statistics Section
    3. Administrative Affairs Section
  - General Dept. for Agricultural Census
    1. Technical Affairs Training Dept.
       - a. Technical Affairs Section
       - b. Training Section
    2. Field Survey and Classification Dept.
       - a. Field Survey Section
       - b. Classification Section
    3. Editing, Analyses and Publishing Dept.
       - a. Editing Section
       - b. Analyses Section
       - c. Publishing Section
    3. Administrative Affairs Section

600

## H. Prior Project Experience

### Prior Projects

In 1980, the USAID/Cairo, in cooperation with the AERI and the U/AES, initiated a Data Collection and Analysis (DCA) Project No. 263-0142. A grant of $5 million was made available to provide technical assistance, training and commodities. The project will be completed on May 31, 1988.

The DCA project purpose is to strengthen the staff capabilities of AERI and to collect and analyze data on a timely basis. The project shifted its institutional setting in late 1985 when a new Undersecretary of Agricultural Economics and Statistics was appointed since the previous Project Director was the Director of AERI and U/AES. The emphasis of the project was primarily on data collection and statistical analysis. Project implementation involved a six year USDA Participating Agency Service Agreement (PASA) and a contract with the International Agricultural Development Services (IADS). While AERI and U/AES staff capabilities to collect and analyze data were partly strengthened, this project did not fully achieve its purpose. The lack of a system to process data and information in a systematic way and a lack of a strong emphasis on well designed and focused policy studies prevented influence on policy decisions and its formulation within the GOE. In retrospect, it appears that the project was not very result oriented with respect to its expected products, i.e. an operating agricultural statistical system, published economic analysis, and dissemination of results. The project did not have a long-term U.S. resident advisor/project coordinator until the last two years of the project although the need for one was recognized early on. In addition, there were eight USAID project officers during the time period with no strong coherent emphasis on project outputs. Furthermore, the project did not supply sufficient local cost financing to carry out extensive field surveys or data collection and processing activities on a routine basis.

In addition to the DCA project, the long running Agricultural Development Systems Project had a sub-project for Agricultural Economics (ADS/Econ). This sub-project involved the U/AES, AERI and the university community. Cairo University was the project headquarters. This project produced 23 economic policy-related studies co-authored by Egyptians and U.S. Economists. The individuals involved, as well as the users of the studies benefited, but there was apparently a lack of institutional development stemming from the ADS/Econ sub-project as both AERI and U/AES still need considerable amount of technical support. The political and economic environment was not strong enough for the implementation of the study recommendations or changes in policies. Approximately $3.5 million was spent on Economic Assistance by ADS/Econ, 70% on studies, 16% on training and 14% for administration.

Among the lessons learned from the DCA and ADS projects applicable to this component to be financed under the NARP are:

1. Concentrate resources in a few key agencies so that resources are adequate to strongly enhance their institutional development.

2. Organize the project so that results are achieved and delivered to decision makers early in the project period. Emphasize the actual delivery of analytical information to policy decision makers, not just institutional expansion in size and activities per se.

3. Provide adequate long-term technical assistance so that short-term consultants are efficiently used and more enduring impacts on quality of analytical products are achieved.

4. Substantial local cost financing to accompany dollar cost financing is needed. Without local operational budgets, dollar-funded TA, commodities, and training will have limited success.

## II. COMPONENT DESCRIPTION

### A. General Statement, Goal and Purpose

The four principal sub-components of the Agricultural Policy Analysis Component are: strengthening agricultural economic and policy analysis "process" capabilities in the MALR; strengthening linkages to facilitate policy dialogue; supporting statistical analysis and data processing; and establishing an information support service center. Each activity is linked with the others at key stages in implementation.

The Agricultural Policy Analysis Component is a direct response to the need to strengthen the U/AES institution and its staff's technical and management capabilities. This is particularly critical in areas of monitoring and evaluating policies, collecting and processing of data, establishing a policy framework, and integrating these into the decision making process. This component will enable the establishment of a coherent policy framework for agriculture policy analysis and action. It is designed to meet and expand the demand for sound policy decision making, strengthen the MALR capacity to coordinate and conduct policy analysis with other institutions, and improve the agriculture information base for such analysis. To meet the current information demand for policy analysis local and external technical institutions and human resources will be utilized to address priority policy issues. Also, the component will expand the base of professional competency in economic and policy analysis; statistics and data processing; and will strengthen linkages with other public and private institutions in addressing and analyzing policy issues in the agricultural sector.

1. Goal

The goal of NARP is to contribute to increased agricultural productivity by improving the quality of technologies available to farmers within a sound economic environment. This component's contribution to the project goal will be mainly through its ability to establish a sound policy environment which will promote growth and investments in the agricultural sector and enable greater exploitation of opportunities.

2. Component's Purpose

The component's purpose is to establish a viable agricultural information system for policy decision making and an indigenous analytical capacity in the U/AES which will impact on the formulation of policies affecting agriculture.

The policy analysis component's purpose will be achieved through the following activities:

- A strengthened analytical capacity and framework within U/AES to identify, design, and assess the positive and negative impacts of policy alternatives. This will be done through external and internal training activities designed to increase staff's technical skills, introduce new analytical methodologies and procedures for data analysis and collection.

- An efficient system for monitoring and evaluating government policies currently being implemented by GOE.

- A computerized national information data base system for addressing management and policy questions which would be easily accessible to the analyst, management, and decision makers.

- An efficient agricultural data collection system, based on the list sampling frame methodology, providing reliable data on a systematic and continuous basis.

- Linkages with other ministries, and public and private institutions, to be built by jointly participating in workshops, conferences, monthly seminars, sharing data and analytical models, and discussing policy analysis.

- A Quick-Response Capability within the Economic Studies Departments of the U/AES by responding quickly and efficiently to ministerial questions concerning policy issues.

- A strengthened management system and organization for the U/AES which will perform its mandated functions efficiently and effectively. An organizational assessment will be completed in the third quarter of FY 88 to develop a reorganization plan for the U/AES and strengthen administrative mechanism and management responsibilities.

B. Description of Component Elements:

1. Background

The GOE has recently announced significant policy changes which will move Egypt's agricultural sector toward a free market structure. Many of these policy changes will have a significant impact on the agricultural crop and livestock subsectors with respect to producer incentives and efficient resource allocation.

Technical capability in performing and designing policy analysis needs strengthening within the U/AES. Most of the current analysis is descriptive. The U/AES economic staff has little experience in systematically assessing the pros and cons of policy strategies or options. There is no follow-up analysis of prospective problems and possible solutions to actions. Efforts at developing a critical mass of talented persons to perform such policy analysis has been complicated by the splitting of the U/AES and AERI institutions, and the employment policies and salary structure existing within the Ministry. Salaries are generally low, personnel are not rewarded for good performance, and people are not generally assigned to positions that complement their professional background, training or experience. Carefully defined job descriptions, statements of work and clear delineation of functional areas of responsibilities are lacking and need to be developed. Furthermore, administrative officers and department heads need to have more delegated authority to respond to day-to-day management and program problems.

The lack of capability to monitor and evaluate impacts of policy reform, and insufficient framework to assess policy implementation is certain to impede the policy reform process. The current economic reforms will have major impacts on producers and consumers. These are reflected by changes in cropping patterns, labor use, external trade and input use, etc. The pace and degree to which the reforms can be implemented will, to a considerable extent, depend upon analysis of the costs and benefits to various members of the society, and the political conviction of the government to follow through with sound policy reforms.

The U/AES of the MALR, by its mandate, provides the staff support for policy decisions involved with the agricultural sector. However, the U/AES is a weak organization with respect to well trained economists,

statisticians and computer specialists. Even though the U/AES has a large staff there is only a small group of well trained, dedicated staff, addressing policy issues and responding to ministerial request. Part of the U/AES staff has some training and experience in drawing up annual work plans, designing policy studies, and carrying out the analysis. The Undersecretariat has two Ph.Ds in Economics and four being trained in Statistics, and eleven staff who have Master's level training in Economics. The remaining staff in the Economic and Statistic Departments have only undergraduate degrees or diplomas from local universities.

The objective of this component will be to develop in-house technical capabilities in general and specific areas as well as the ability to respond to immediate policy requests. A small, select group of well trained staff will be given the responsibility to perform short-term policy studies and manage medium-term contracted studies with other organizations (which will be monitored by a special technical committee). The assignment of special task forces will be utilized to address policy measures requiring institutional changes or new direction within the subsector. The task force reports and contracted policy studies will expand the capacity of for the MALR to address current policy issues; it will increase the involvement of other organizations in conducting policy analysis. The component will provide a wider participating basis for food and agricultural decision making.

2. Strengthening Agricultural Economic and Policy Analysis Function

This sub-component represents an approach directed toward the development of MALR analytical capacity to conduct more in-depth priority policy analysis. This approach does not entirely rely on the establishment of a self-contained unit in the U/AES but progress toward mobilizing the capacity of other institutions to carry out economic and policy research analyses. This approach may be termed "process capacity building" to differentiate it from the standard approach of building "internal capacity". The process capacity approach is better suited to the needs and constraints of Egypt. Experience with the "internal capacity-building" approach has repeatedly indicated that the challenge is to retain analysts in the system, to direct their skills toward addressing priority economic policy issues, and to establish the capacity to interpret and utilize the results of analysis to achieve actual improvements in agricultural policy. Process capacity-building does not reduce the need to raise the capacity of central government units, but it shifts the focus of attention from actually doing the analysis to "getting it done". Local institutions and resources will be used to concentrate on and complete analysis quickly and efficiently. Therefore, the central unit is freed up to carry out a broader mandate including the definition of priorities, mobilization of analysts in the private and public sectors, coordination and monitoring all researchers and studies, and utilization of the results. The strengthening of the policy analysis function will be centered around the following three programs.

a. Development of a Monitoring and Evaluation System

A major ingredient of effective public sector agricultural policy formulation is monitoring and evaluating policies being implemented and quantifying their impact on the sector's performance. A technical capability is required to track progress, learn from past experience, and determine what policy measures appear to work and under what circumstance. Historically, there has been little, if any, need by the MALR to monitor GOE government controlled policies. But given the new priority that the GOE has placed on a market-led economy, the removal of price controls and the initiation of other reforms, the monitoring and evaluation of these major reforms are critical to senior government officials and policy decision makers.

Given the high priority for verification and evaluation of policy reforms, timely feedback of the results is extremely important to policy decision makers. A policy framework system, geared to identify the extent to which policy measures are having their intended benefit, will be developed. Long and short-term technical assistance will be used to establish an analysis group which will receive specialized training in analytical methods and procedures, establish a monitoring program, and establish a computer center to quickly service their needs. Staff presently assigned to the U/AES and those on loan to the U/AES from other institutions will be trained to perform the monitoring and evaluation task.

The outputs of this activity will be:

- Establishment of an internal management system to monitor the progress being made and completion of ministerial requests and impact studies.

- Establishment of baseline projections to evaluate policy reforms and the impact of government intervention on farms and sector level areas;

- A staff capability to design, manage, and perform policy impact analysis;

- An operational monitoring system which provides feedback from those affected by the GOE policies, including a monitoring and evaluation capability to identify and evaluate impacts of policy reforms being implemented, and an administrative capability to coordinate similar activities with other public and private entities;

- Establish and make operational various analytical tools being utilized by other ministries to evaluate policy programs such as the agricultural sector L.P. model developed by the Ministry of Public Works and Water Resources, budget generator, commodity balance sheets, production and response functions, etc;

b. Establishment of Commodity Specialist Program

A commodity outlook specialist program will be developed to facilitate policy analysis and begin a process of regular reporting as well as strengthening the capacity of the economic department and field offices to respond quickly to specific policy questions. The commodity outlook program will be developed within the economic department using junior staff members with B.S. degrees or diplomas in agriculture. They will become specialists in specific commodities or problem areas. The commodity areas could be, but are not limited to, basic grains, lentils, cotton, peanuts, vegetables, citrus, peanuts, livestock, poultry, natural resources, etc. The basic concept of the program is that each individual becomes a primary information resource for an individual commodity or special topic. The commodity specialist will become a critical resource person for others within the U/AES working on specific policy issues, impact assessments, task forces, or special policy studies.

The commodity specialist will be expected to visit and establish professional linkages with appropriate agencies, organizations, universities, private producers, processors, research specialist and extension workers, etc., and become familiar with pertinent library resources and documents. Information collected would be part of the information base used for policy analysis.

In collaboration with the data collection and processing units, the commodity specialist will review and maintain routine basic data on domestic production, processing, commercialization and consumption - including input and output price, and trade statistics. The commodity specialist will work closely with statistical units in data collection. Such information will also become part of the integrated data base system developed by the data processing unit. The data base accessibility will be extended to analyst and policy decision makers.

During each year of the project, a series of two to three day commodity outlook situation technical workshops will be conducted, (i.e. quarterly). These workshops will concentrate on introducing ways to improve the reporting and collection of information,



101

basic analytical procedures, review specific research and special papers on specific commodities, or related topics, and draw on lessons learned from other activities. These technical workshops will serve as a means to improve commodity specialist skills and knowledge, and as a forum to address problems and propose solutions to strengthen the commodity outlook situation program. Also, during each year a three-day national policy commodity outlook situation conference will be held. This national conference will review each major commodity with respect to projected production levels and consumption, involvement of the private sector, and specific technical or policy issues facing this commodity. The commodity outlook situation conferences will be geared to the needs of Egypt's policy analysts, decision makers, extension personnel, private sector producers and will help to stimulate the demand for policy analysis and general information.

The major output from this activity is: --A Commodity Outlook Program with a trained junior staff (approximately 20 per year) of commodity specialists with responsibility for routine monitoring and reporting of information and problems related to domestic production, processing, utilization, and consumption including price information. Commodity specialists will serve as technical resource individuals (to supply information and assist with analysis) for the policy analyst group and other working groups outside the U/AES.

c. Quick-Response Decision Support:

Food and agricultural policy is constantly under review by the Ministry of Agriculture and other senior government officials who are always in need of current information about the sector. For reasons cited earlier, these needs are increasing. This component will develop a quick-response in-house economic analysis and reporting capability.

The quick-response analysis capability means the ability of a staff to generate policy briefs that summarize, in appropriate executive format, a large amount of economic intelligence, results of historical and recently completed policy studies, internal working papers, survey results and recent observation on Egyptian agriculture. It means the analysis staff must be able to correctly interpret agricultural policy problems of an economic nature from the top down or bottom-up, correctly apply results of completed studies or conduct new summary analysis, and identify alternative strategies to be evaluated. Such capability must utilize microcomputer-based technology and programs to perform, in a very short timeframe, economic analysis in a quantitative as well as graphic and other visual formats.



68

The development of such a capability will require the integration and utilization of a small set of appropriate analytical tools such as a commodity enterprise costs and returns budget generator, commodity food balance sheets, regression models, policy analysis matrix, L.P. model, acreage and yield response models, and a report writer, all accessible to an on-line data bank. Mid-level staff will be trained to utilize P.C. computers and appropriate software programs linked to the on line data bank. Also, staff will be trained (through in country workshops) in the selection of appropriate analytical tools and report preparation with the utilization of appropriate graphic and visual aids. The development of policy guidelines will help the analyst logically progress from the identification of a policy oriented problem to the review of completed research, select appropriate data for pivotal analysis and present results with explicit attention to policy goals, instruments, and indicators with reasonable goal directed program targets. Policy briefs will serve as a means to inform senior level officials on policy issues and the agricultural sector's performance. Policy briefs will be distributed to government officials and private sector leaders.

The primary output from this activity would be a series of ministerial memorandums, policy guidelines and briefs designed to address specific policy questions on short notice. This information could be produced in a few hours or days. The long-term technical advisor will be responsible for assisting in developing appropriate analytical models, a reporting system and reporting format for use in responding to such requests. A program will be developed to train staff on the use of P.C. computers and software, selection of appropriate analytical tools and report preparation.

Major inputs required to strengthen the analytical and management capabilities of the U/AES in policy analysis include long-term technical assistance by a Senior Policy Advisor, a Production Economist and a Management Specialist for a period of 156 p.m. and 109 p.m. short-term technical assistance. Short-term technical assistance will be in the area of price analysis, resource analysis, trade analysis, situation and outlook agricultural marketing, and farm production economics and multiple areas of management. Both long- and short-term technical assistance cost is estimated at $4.3 million over a six year period. Major commodities and equipment in direct support of the policy analysis function include vehicles, motorcycles (50), computer equipment (9 P.C. computers) and associated software, photocopiers (4), calculators, and office equipment at an estimated cost of $169,000. Office upgrading and/or renovation at governorates and headquarter locations will be required to provide the proper environment for analytical work and sensitive computer

equipment, which must be in a dust free environment. Costs associated with renovation are estimated at $200,000. Upgraded facilities will also act as an incentive to attract and retain qualified technically-capable personnel. Almost all of the training in support of the policy analysis staff is to be provided through a general contractor with approximately four participants receiving long-term academic training, thirty seven receiving short-term technical training, including job-site hands-on training at the United States Department of Agriculture (USDA), the National Agricultural Statistical Service (NASS), or other related U.S. Government agencies or private institutions. In-country training will be provided and arranged by the General Contractor at a total cost of $1.2, million, to be granted from local currency support. The levels of technical assistance, commodity and training support were developed by a USDA and NASS team and several consultants working on the design of the policy component.

3. Strengthening Linkages to Facilitate Policy Dialogue:

In Egypt, numerous ministries, semi-autonomous agencies and development authorities are involved in managing the agricultural sector. These institutions each have narrowly defined areas of influence, making broad sector analysis, formulation, and implementation of agricultural policies and programs a difficult exercise. In this environment, agricultural ministries and related agencies are so engrossed in the day-to-day problems of implementing their development programs that little or no attention is given to the impact of macro-economic and sectoral policies.

The objective of this sub-component is to assist with improving the process of agricultural policy formulation in Egypt. The strategy of the sub-component is to raise the level of inter-ministerial discussion and involvement in policy issues, and strengthen the capacity of public and private sector organizations in the performance of policy analysis. The sub-component will also encourage wider participation in policy formulation. A series of activities are proposed to address policy issues, encourage policy dialogue with agricultural producers, traders and consumers, and increase general understanding of Egyptian agriculture. The component will finance a series of approximately 50 studies and utilize special task forces which will be managed by the U/AES and a technical policy committee. These will be principally medium and long-term problem focused policy studies or reports conducted over the life of the project. The following lists of policy studies have been identified as probable areas of concentration during the early phases of project implementation:



60

- Estimation of supply elasticities for principal commodities;
- Analysis of cotton and wheat subsidies as they relate to producers, marketers and consumers;
- Analysis of input market structure to handle the distribution of agricultural inputs;
- Price and marketing studies by region;
- Analysis of the impact of a change in the exchange rate on major commodities;
- Analysis of tariff policies on agricultural inputs and commodities;
- Analysis of policies to strengthen the agricultural export sector;
- Analysis of changes in input and output prices and optimal cropping pattern;
- Analysis of domestic prices in relation to international prices;
- Analysis of institutional and economic options for optimizing use of water;
- Analysis of credit policies and subsidies;
- Analysis of farm profitability.

The ultimate output of this activity will be formulation of policies which are well planned, the impact of which can be anticipated an agriculture and related sectors.

The selection and awarding of policy studies will be handled by a technical policy committee to be chaired by the Undersecretary of AES. The committee will have representatives from various organizations and agencies with approximately nine members (e.g. ARC, PBDAC, Universities, AERI). The committee will review a list of proposed policy topics submitted by the U/AES which will establish the policy agenda for the year. However, during the first several years the policy agenda will be primarily based around the current policy reforms being implemented by the GOE and in accordance with USAID, World Bank, and the International Monetary Fund programs. The committee will review the list and justification of each study, and rank each one according to the relative importance with respect to current policy concerns. The committee will assign a working group to develop the terms of reference (TOR) and estimated budget. The TOR will be reviewed by the committee and USAID for approval and will be approved through a Project Implementation Letter. The advertisement, selection and award process will follow USAID Host Country contracting procedures, HB 11, Chapter 1. Fixed Amount Reimbursable contracts will be negotiated by the U/AES or appointed representative, with USAID approving the final contract and award. Contracts may be pre-funded with 20 percent of the total contract amount being retained until the committee approves the completed study. Unsolicited proposals will be reviewed and funded under special studies, but must receive approval by USAID. All studies will have an executive summary which will be translated into Arabic and widely distributed.



bll

The Technical Policy committee can request that a special task force be convened to address specific policy measures or issues which cut across ministries. A task force will be assigned, with the approval of the Minister of Agriculture, to address policy reform measures which require institutional changes, new directions for a particular subsector or which outline new policy changes. The programmatic administrative changes must be identified in the proposal. Each task force will have an appointed team leader/convenor, responsible for convening the task force and providing management direction. The team leader should be of sufficient ministerial rank to provide the leadership required to manage people and resources. The task force can request that a special study be undertaken to address a particular question(s) prior to the completion of the final report by the task force. All task force reports will be distributed to policy decision makers for discussion in a special policy workshop which is expected to review the recommendations and develop an action plan. The long-term resident advisor will serve as technical advisor and assist the task force in the utilization of certain quantitative methods used to analyze production, price, or marketing constraints. Short-term technical assistance can be utilized to assist the task force achieve its objectives when needed.

The U/AES will sponsor a series of approximately 10 policy related workshops annually, to encourage dialogue among policy decision makers, producers, traders and consumers in the public and private sector. The workshops will utilize many of the contracted studies or task force reports as a basis for workshop topics. The workshops will be a means to disseminate information concerning policy strategies being proposed or changed among ministries and other agricultural organizations.

Major inputs in support of the above listed activities include costs associated with the policy studies, technical assistance, surveys, support equipment and supplies, estimated at an average cost of $50,000 per study. A total cost of approximately $2,500 million will be reserved for the life of project to cover expenses associated with studies or task force reports, and $50,000 for the sponsoring of approximately ten policy workshops per year. Annual expenditures are estimated at $300,000 to be implemented through the a policy studies support activity.

4. <u>Statistical Analysis and Data Processing Services</u>:

a. Introduction:

The statistical analysis and data processing sub-component will greatly enhance the existing basic agricultural statistics collection system and related programs. More accurate and efficient designs for gathering data using the sampling frame

concept will provide more timely results at less cost. The sampling frame concept has been tested in other countries and serves as the basis for the information system used in the United States.

The basic objective of the sampling frame concept is to develop a timely and reliable agricultural statistics system with programs that are responsive to the various data users in the country. Primary emphasis is on policy analysis, commodity situation and outlook reporting. This would accommodate the short-term needs for monitoring the implementation of economic reforms. The development of a credible agricultural information system for Egypt will become more critical as governmental controls are removed. Under this project, an improved system for the collection of basic agricultural data and publishing of agricultural statistics will be implemented. This system, based upon a probability sample methodology, will provide reliable data on a timely and cost effective basis through the use of special low cost survey techniques.

The following activities will be undertaken in this area:

- Monitoring of Economic Reforms: The statistical department will coordinate with the economic unit in the development of probability samples from the list frame and completed surveys, to verify fulfillment of conditions necessary for payment of the scheduled tranches under the Agriculture Production and Credit Project.

- Establishment of National List Sampling Frames: The list sampling frame is a statistical method of selecting an agricultural sample based on the objective characteristics of the agricultural system rather than artificial political boundaries. The list sampling frame permits a high degree of accuracy from a much smaller sample than is currently used in Egypt, thereby greatly reducing data collection costs.

- Derivation of objective yield measurements and estimates of major crop production. Detailed counts and measurements from the field are factored into probability and statistical techniques to give estimates and develop forecast models;

- Development of a series of cost of production estimates for crops and livestock;

- Verification of Administrative Statistics: Administrative data is currently the main source of primary agricultural information. Verification of this data is required to determine the degree of bias and level of error. This can be done through special statistical procedures and techniques;

- Development of Agricultural Input Surveys: Better information is needed on use of agricultural inputs at the farm level. Such information will be useful in determining appropriate policies and programs to encourage increased use and efficiency of inputs;

- A quarterly schedule to collect and disseminate basic agricultural data in order to provide early estimates to the GOE for decision-making in economic policy analysis and planning;

- Development of methodology for agricultural census by sampling; and

- Automated data processing system to compile and analyze raw data, make agricultural data available to national and district level decision makers on a more timely basis, and reduce errors associated with hand processing.

b. Development of National List Sampling Frames: A high priority is to establish a complete List Sampling Frames (LSF) for Egypt that will support probability based sampling. These frames are needed to permit timely and accurate collection of data to be used in further analysis, leading to policy decisions and monitoring effects of policy changes. It is vital that this activity be given a high priority in order to serve as the foundation for the entire project.

Development of these LSF will provide an integrated (general purpose) sample survey design that will provide a probability basis for data collection activities in Egypt. The basic survey design is a multiple frame sampling plan, that will rely on stratification of the frames and replication of the samples to gain efficiencies over time. The two basic list frames to be developed in this multiple frame design are:

—Certainty List (CL)— A list of large private and public holders. The CL will contain the names of extremely large, specialized, or rare item holders located in Egypt.

— Village List (VL)— A complete list of all villages by governorate, sorted within districts and within governorates, with correlated information on the number of holders, holding area, etc. (taken from the last census or reliable administrative records). Using the latest available control information, all villages are theoretically subdivided into clusters containing approximately the same number of holders. When a village is selected for survey, village sketch maps and correlated village lists of holders will be used to subdivide sampled villages into the assigned number of clusters. The sample clusters are then selected. Sample clusters are groups of holders corresponding to intervals of households along a serpentine ordering given on the village sketch map.

This plan will provide for the development of national list sample frames from which samples can be drawn to provide reliable indicators for commodity items that are widely dispersed across the nation. By the end of the first year, the list frames will facilitate the collection of data in subsequent national survey activities throughout the project.

Once the LSF is constructed, it will be used to select a random sample of units for actual data collection. Each year a new sample is selected at random from the LSF. The LSF is an extremely valuable tool since it can be used to construct special low cost rapid reconnaissance surveys for specific data needs, or specific economic studies. It is important to maintain the LSF and update the frames yearly as people or firms change.

Furthermore, when the national sampling frames are operational a routine cycle of agricultural surveys will be established to provide basic information requested by data users. Regularly scheduled surveys will be done routinely for the collection of cost of production, labor, farm income, crops, livestock, and related agricultural data.

Technical assistance and training will be required in order to successfully adopt the proposed LSF system. Actual data collection technique will not be new to the field staff, but training will be required to prepare them on procedures and questionnaires used in data collection under the new LSF system. Controlled supervision will raise the accuracy of the crop reporters' data and reduce non-sampling errors. Stratified samples, improved training and supervision, and controlled logistic support will increase accuracy, improve timeliness and increase credibility of published estimates. In addition to improving accuracy of estimates, new objective yield measurement technology will be introduced to forecast crop yields while the crop is still in the field.

Also, preliminary collection of data will be made more timely and efficient by the provision of motorcycles to field enumerators and field vehicles for supervisory and project staff. Modern office equipment will asset in improving the accuracy in the preliminary tabulation of data.

c. Establishment of Objective Forecast Models. The utilization of surveys to collect information on planted and harvested acreage and crop development will provide a more reliable and cost effective method for the computation of crop yields and production estimates. The expansion of the objective yield pilot survey work (developed under the DCA project) needs to be extended to a

national level. The MALR has developed the expertise to conduct objective yield surveys, and now the efforts need to be made on improving national level indicators and estimates. The MALR needs to establish priorities for undertaking crop surveys, and determine the frequency and timing needed for survey indications of final production in order to make national forecasts of production. With this information, a phased approach can be taken to bring the most important crops into a regular survey cycle, eventually providing national estimates during the growing season and at harvest for all major crops. As MALR develops the expertise and the capability to support the larger scale surveys, additional surveys can be added to the operational program.

During the first year of the project (crop year 1988), it is expected that priorities will be set, and initial efforts made to implement surveys to estimate final production figures for two crops on a national scale using this methodology. In the first year data will be collected to develop yield forecast models. Additional crops will be added as necessary and feasible during the six year project. The objective is first to produce production estimates, and after sufficient data is collected, to develop yield forecast models, to make production forecasts.

d. Development of Economics of Crop Production and Livestock Estimates. Production and livestock costs and returns estimates are both a statistical effort and an economic activity. Work in production and livestock forecasting is listed in this section as a sampling frames from which surveys are taken, and much of the raw data derived in the surveys are of a statistical nature. Production costs and return estimates have already been taken on a pilot basis and are ready to be expanded for national coverage. Surveys need to be carried out on a staggered basis for several crops in order to not overload the system. In some instances the number of samples may need to be reduced eventhough this might reduce the ability to draw inferences on separate governorates. Drawing inferences to governorates may not be required in all instances. Furthermore, livestock estimates need to be developed since livestock data for Egypt are considered to be very poor.

Obtaining production costs and returns estimates and the development of a system for producing these estimates is central to information data for policy development and monitoring policy changes. The surveys will cover input costs, output values, and contain specially designed questions, which could address issues of prices, area, quota controls, and farm income. The system now in



616

place will be evaluated to determine which crops to include and which administrative divisions will be responsible for the new efforts in this critical area. The Economic Analyst will work with the statistician in the design of the surveys and analysis of results.

e. Verification of Administrative Statistics: The bulk of basic national agricultural statistics is based upon administrative village reports, compiled at the district and governorate level. The verification studies to be developed, will give an indication of the extent and degree of bias in the reports. The verification studies should also provide a basis for developing better data through edit checks and enumerator training and motivation.

The current system of collection of administrative data by the MALR through the village based enumerators would be continued for some time. Until a probability based survey system is in place to provide a comprehensive dynamic information base, it is prudent to continue using the existing system. During the third year of the project, the existing system would be studied and recommendation made for its continuation or modification.

f. Development of Agricultural Inputs Survey: Currently statistics on the use of input resources are highly aggregated and indicate total sales of major types of fertilizers, pesticides, and plant protection material. Analysts will determine the most critical need for production input use data and design programs to encourage adoption. A system to collect various types of input data will be designed for each major crop. Information such as extent of commercial seed used, level of fertilizer and pesticides used, type of cultivation practices utilized, labor use, and prices will be collected annually. This type of information is important in the construction of budgets, measuring demand, extent to which certain technologies have been adopted, and whether there is an efficient use of resources. The national data from the use of low cost rapid reconnaissance surveys, utilizing the list sample frames concept will be utilized to collect such information.

g. Quarterly Scheduling of Data Collection: Currently data collection and processing are very time consuming activities and data is released very late and not published for widespread distribution. Early preliminary estimates are necessary for good economic and policy analysis, planning, and decision-making within the GOE. Tight schedules for collection and publication of agricultural data need to be enforced. A schedule for initializing surveys for each crop, production input and other special item should be developed. A schedule for survey and publication dates would make data available to decision makers and other users



67

on a regular and predictable basis. The schedule should be followed in order to establish confidence and credibility in the reporting system. Increased information can translate into potentially large savings for the government, resulting in the ability to provide more timely estimates of import needs or export potentials for major crops.

h. Develop Methodology for Agricultural Census by Sampling: A total enumeration of Egypt's nearly 3 million farmers would be expensive, time consuming, and unwieldy. Results from the 1981-82 agricultural census are still not complete. Many countries are currently utilizing probability sampling to obtain census type information on the agricultural sector. Using a sample survey in 1992 instead of a complete enumeration should result in more accurate and timely information at about a third to one half the cost of a total enumeration. It takes up to four years to design the sample, test the questionnaire, and train the enumerators and administrative staff. Therefore initial planning and design efforts for the 1992 census should start no later than 1988. Results from the census should provide a baseline data set for benchmark purposes on many data elements which are not included in the regular annual survey program.

Major inputs in support of strengthening the statistical program include long-term U.S. technical assistance of 60 p.m. and short-term 40 p.m at an estimated cost of $1.7 million. Short-term TA will be in areas of sampling, statistical procedures, survey design, statistical programming and analysis. One long-term resident statistical advisor will be required for the first four years of the project. The commodities and equipment needed to support of this element include computer equipment and associated software, photocopiers, calculators, 225 motorcycles and 39 vehicles (for field enumeration), field and office equipment at an estimated cost of $1 million. One participants will receive long-term training in statistical methods for two years, 24 participants would receive short-term technical training in multiple fields of approximately two months duration, and 8 participants will receive hands-on training for approximately two months duration at USDA, NASS, or other related agencies. The total long-term and short-term training costs are estimated at $300,000. Approximately 400 field staff would receive local in-country training in data collection, and statistical procedures during the life of project and the course would be organized by the contractor. In-country training cost are estimated at $360,000.

i. Data Processing, Storage and Retrieval System Services:

Widespread availability of reliable, inexpensive automated data processing equipment which does not require highly specialized operators, has eliminated the need to depend on costly and inaccurate hand tabulation of basic data. Automation of data processing through an integrated P.C. computers and a mainframe system will replace hand tabulation. Hand tabulation is one of the major sources of delay in making basic agricultural data available for decision-making and analysis.

During the last few months of the DCA project an NCR mainframe computer was purchased and installed in the U/AES computer and data processing department. The mainframe computer and 15 P.C. computers were purchased to facilitate the training of U/AES staff on the use of P.C. computers in statistical and economic analysis. U/AES staff also received training in codification, tabulation and processing of primary data collected from governorate offices.

The establishment of appropriate computer services is a very important part of strengthening capabilities in policy and statistical analysis as well as techniques of processing information in a timely manner. The mainframe computer is intended to serve the needs of the U/AES for statistical and analytical work. Central computers with suitable hardware and software configuration are necessary to maintain the large data bases and analytical programs and models which will be utilized in statistical and policy analysis activities. A statistical analysis system for processing and providing summary statistics will be installed to facilitate policy analysis.

The installation and maintenance of the L.P. agricultural sector model and the budget generator in the Ministry of Public Works and Water Resources was developed under the DCA project on the mainframe computer. This system will facilitate the evaluation of policy reform measures at both the farm and sector level. The use of the mainframe computer, alone with suitable hardware and software, is necessary to maintain the data bases and analytical programs and models used in policy analysis.

Furthermore, during the first year, the most important activity is the development of a economics and statistics analyses activities for use by the computer center. In addition to outlining specific requirements in the area of economics and statistics, this plan would detail general goals, objectives, tasks, milestones, dates, and personnel requirements, assumptions and constraints.

Also, a general plan should be developed which details the type of activities that U/AES and other user groups envisions for the computer. Projections of computer resource requirements should be made, e.g., time (both elapsed clock time and central processor unit (CPU) time, disk storage space, memory size of programs, tape drive requirements, file size, data entry demands, PC and mainframe processing requirements, projected frequency of processing (daily, weekly, monthly, or quarterly, semiannually, annually), and batch processing versus interactive. This plan would quantify all resources required to perform program analysis, indicating beginning and ending dates for design, programming, testing, and implementation. The user community needs to play an active role in determining required contents for the data base construction. In addition, it will be important to plan what is expected from the computer in terms of support for the next 5 years.

A staff assessment will be undertaken to determine staff development requirements to maintain operational aspects of the program. It will be critical to have people trained in systems engineering, analysis, programming in operational (mainframe-micro) capacities. The data entry, edit, summarization, and analyses of the economic and statistics project activities will be implemented immediately, either through use of the mainframe computer or the microcomputer.

During the first year, the specific kinds of data to be put into machine media from the project survey area include:

a. Monitoring surveys.
b. Pilot surveys used in the development of the national sampling frames.
c. Citrus and cotton yield surveys.
d. Profitability of crop production surveys.
e. Inputs data survey.

There will be a concerted effort during the second year to strengthen the capacity of field offices and strengthen linkages between field and the mainframe. The plan to do so will be developed during the first year. The projected implementation plan will review the feasibility of achieving linkage between the closest field offices and what types of information will be exchanged, surveying the best use of personal computers at field offices, installing the personal computers, and conducting training on utilization. Lessons learned from preliminary installations could be used to accelerate future field offices implementations and to effectively connect field offices to the mainframe either through diskette media or through electronic modem.

All economic, statistical, and sampling forecast, surveys and questionnaires must involve the data processing department analysts very early in the developmental process. This team effort will insure

that survey information can be readily convertible into data processing media. The organization of questionnaires can make data entry easier and less prone to error. Proper data checks and update procedures can speed processing and improve final results. Accurate data storage systems and use of appropriate media can greatly enhance data retrieval and provide quick access to respond to quick requests. A relationship or direct linkage to the primary data base may be necessary in order that the analysts will be able to have access to data. This kind of interaction will preclude a situation in which statistical and economic activities are taking place in a vacuum, and will require that data processing specialists react to data requirements and design data processing accordingly.

The output of this activity will be a functioning computer and data processing service capability which can meet computation and information requirements of the U/AES specifically, and the agricultural sector in general. In a more immediate sense, outputs will include:

- An operational computer system and cluster units. The first output is a two year work plan consisting of the installation and testing of the mainframe computer and related facilities. Included with this is the formulation of detailed plans for operational use of the center. The second major output is the start-up, testing and operation of the NCR computer purchased under the DCA project.

- Functioning institutional mechanisms which processes primary information to serve specific needs of end-users;

- The development of codified forms for the systematic transfer and reporting of data from governorate offices.

- Improved information flows between governorate field offices and the central office, U/AES;

- A total of 65 personal computers will be installed in the statistical and data processing divisions and 38 field offices to facilitate data processing and analysis;

- Data bases of continuous (time series) and non-continuous data series which will support the needs of policy analysis and programs management. Data base development involves designing the data base so that stored data is easily retrievable. It also involves entering and editing the data and cataloging the data base.

- The training of computer users on the use of available commercial packages and programs (e.g. Cobalt, Lotus, SAS, Total, DBase III, SSPS, etc.) and on the uses of computers.

- Disseminating information to other public sector institutions, existing and newly-created data bases and programs.

- Developing a training program for the NCR mainframe computer. The U/AES staff will receive training on how to operate, maintain and train headquarter and field office staff.

All the equipment provided will have full hardware and software compatibility. In addition to the above equipment, an identical microcomputer to those provided to the U/AES will be installed in the contractor's office. Experience in other countries has demonstrated that this approach is extremely valuable, permitting the contractor's staff to develop or refine software as needed, to troubleshoot problems with software or hardware, and to provide training to project participants on the equipment they are using. At the end of the project, this machine will be transferred to the U/AES to serve as an additional spare or data entry terminal.

Major inputs for computer and data processing include long-term technical assistance by one resident advisor for a period of approximately 60 person months. Part of this TA will be handled through a USDA PASA. This individual will be experienced in computer programming, data base development, and data processing and management. This person will work directly with the computer center/data processing director and the Undersecretary of AES. Short-term technical assistance to support the development of the computer center and development of a data base and in conducting training workshops is required for approximately 48 p.m. .

Short-term training will be provided to two individuals for the equivalent of a Bachelor's degree in data processing, management and computer programming. The types of training for the data processing department Staff, required during the first year of operation, will include the general areas of microcomputers, mainframe data base design development, job control language, micro to mainframe data interface, data manipulation, and general application software development.

AID will provide materials and equipment required to make the computer and data processing center operational. This includes: computer equipment, disk and tape drives, related software, initial and consumable supplies, vehicles, books, reference materials,

specialized furniture required for the center and 3 photocopiers. Field offices will receive P.C. computers, related software, supplies and furniture as required. Office renovation will be financed on a case by case basis to create the appropriate work space and environment for computers and staff.

5. Information Support Center

The timely dissemination of relevant and credible information needed for discussion, debate and formulation of agricultural policies has been inadequate and is generally recognized as a major constraint in agricultural policy decision making. The involvement of many ministries, cabinet members, and other agencies scattered throughout the government make it impossible for each agency or institute to effectively inform all decision makers involved in the agricultural policy formation process. The current problem is the result of information gaps, (unavailability of necessary findings and recommendations), poor distribution of policy studies and technical reports, (a weak information distribution system), and poor linkages to key decision makers. There have been many studies and special reports completed under previous projects such as the ADS and the DCA where the results and recommendations were neither widely distributed nor discussed with policy decision makers. Furthermore, existing statistical data series are not published on a regular schedule and the processing of recent agricultural census is taking longer than normal. Once technical and economic information can be made available on a timely basis and directed at key sector and policy concerns, many potential and alternative policies will emerge. Without credible and timely information, GOE decision makers are less likely to accept the need or perceive the possibilities for corrective action.

An information support center will be established within the MALR - U/AES as a service unit to both the public and private sectors. Presently, considerable amount of primary and secondary information relevant to the agricultural sector exists, but the quality, scope and accessibility of this information requires improvements. Therefore, the establishment of an information support center will be vital to the development and distribution of important policy information.

The information support center will have several functions: coordination of information sources; reproduction of important results; and to serve as a depository of policy-related reports and studies for the U/AES, MALR. The information center will be responsible for:

- to assist and support the development of an official U/AES paper series on economic, policy and statistical issues.

- to reproduce reports, studies and official U/AES papers.

- to distribute documents and studies produced by the U/AES to public and private institutions.

- to serve as the central depository for policy papers, technical articles and other documents.

- to provide support services to staff analysts in the development of visual aids and graphics for use at conferences and workshops.

- to establish and maintain liaison with existing domestic and international networks.

The above will provide GOE decision makers, managers, and other technicians and analysts with the appropriate tools to perform their respective duties. The information support center will improve the quality and access to information, the inputs for improving decisions and actions. The establishment of an information support center in the U/AES will focus on meeting the demands for information in the support of policy analysis. The activities under this component are constructed in phased and integrated approach whereby the technical capacity and data bases are first developed, reports and series are established, and effective products delivered and responses made to requests for information. An information support center, created in the U/AES will serve primarily as a support/service unit primarily to the U/AES; secondly to the remainder of the MALR; thirdly to other public sector agencies or institutions; and fourthly to the general public. This center is designed to manage information source documents, and is not intended to serve as an analytical unit.

The information support center will be located in the U/AES building, where it can directly serve U/AES analytical groups, and MALR in general. The center will draw on commodity specialists from the economic unit as resource persons.

The center coordinator will respond directly to the undersecretariat. The undersecretariat will channel all requests for information services from the minister to the center coordinator. The Minister will also channel information requests from other government officials and agencies. Requests originating within the U/AES will be delivered directly to the center's coordinator. Priorities will be established for responding to the varied requests. Operationally, the center will respond first to the immediate needs of the U/AES.



624

Nevertheless, it is envisioned that avenues of communication, cooperation and coordination will be established in consultation with other agencies such as AERI, universities and other public organizations. In the ultimate sense, the output of this subcomponent will be a support service center, capable of serving the general information requirements of the agricultural sector. In a more immediate sense, outputs will include:

- Functioning institutional mechanisms facilitating the flow of information which serve specific needs of end-users.

- A documentation center for the storage, reproduction, and publication of data and reports and a depository for original information.

- Improved information flows between the government and the U/AES.

- Functioning programs and personnel trained in administrative information management.

Major AID inputs in support of this program include the long-term TA from a U.S. information/media specialist for 18 p.m. and short-term TA of 16 p.m. in multiple areas at an estimated cost of $546,000. The equipment cost is estimated to be $155,000, and the training costs are calculated at $231,000. Short-term T.A. will be provided after the first year and a half to assist and support the center's coordinator in specific problem areas. Short-term T.A. will be provided for a period of approximately three person months per year. Short-term training will be provided as needed to the information specialist (coordinator) who will head the center and to all assistants in the division. AID will provide materials and equipment which will be required to make the information center operational. This includes, photo copiers, book binders, computers, related software, initial supplies, books, and reference materials, specialized furniture and office renovation.

The GOE contribution will include sufficient office space to house the center and U/AES personnel salaries. Subscriptions to journals and the purchase of documents, other than those initially procured, will become the responsibility of the GOE at the end of project component. Local support costs not mentioned will also be the responsibility of the GOE.



615

6. End of Project Status - Agricultural Policy Analysis Component

At end of the project and with the achievement of planned outputs, progress will have been made towards the attainment of:

a. Renewed interest and greater expertise among Egyptian scholars in agricultural policy analysis;

b. Increased awareness among senior government officials and policy makers on the utility of applying policy analysis in decision making;

c. Strengthened linkages between policy analysts and decision makers;

d. A number of quality analytical studies which will have some effect on policies and the use of paradigms to structure future policy analysis and research;

e. A group of experienced policy analysts with improved analytical capabilities and the ability to continue working in the field and are able to provide instructions on statistical techniques and methods;

f. Substantial progress towards institutionalizing an improved agricultural statistics system in Egypt.

## IV. IMPLEMENTATION, CONTRACTING, FINANCIAL, EVALUATION AND TRAINING PLAN

### A. Implementation Plan and Schedule

The implementation schedule reflects major actions that are required to ensure project inputs are available on a timely basis under the APA component. Included in this list of outputs are: (a) the monitoring of policy reforms; (b) establishment of a data and statistical system; (c) training of U/AES staff; and (d) the establishment of a policy analysis system with responsibility to review and evaluate policy decision and programs and recommend appropriate policy recommendations supporting the growth and expansion of the agricultural sector. The major actions to be undertaken during this project components life are anticipated as follows:



62

Implementation Schedule

| Year/Quarter | Action | Responsible Agency |
|---|---|---|
| FY 88 | | |
| 1 | T.A. to develop a monitoring system plan for tranche two benchmarks, policy reform activities; | TA |
| 1 | Development of verification questionnaires | U/AES/TA |
| 1 | Review and approve first round monitoring survey questionnaires; | USAID |
| 1 | T. A. drafted/completed to assist in the development of an annual work plan for the Agricultural Policy Analysis Component activities; | TA |
| 1 | Monitoring & verification activities begin on policy reforms; | U/AES |
| 1 | Development of scope of work for PBDAC divestiture study completed; | TA/U/AES |
| 2 | FY 1988 Financial Work Plan for Agricultural Policy Analysis Component completed; | TA/U/AES |
| 2 | T.A. to assist developing a baseline sector assessment work plan for the policy reform activities; | TA/U/AES |
| 2 | NARP steering committee approved APA's first year financial plan; | MALR |
| 2 | PIL issued reallocating NARP borrowed funds for APA component first year activities; | USAID |
| 2 | Project Paper NARP Amendment No. 2 completed/approved; | MALR/USAID |
| 2 | Host Country Personal Services Contracts drafted for Economist and Statistician; | MALR/USAID |
| 2 | Review of the developed objective yield program plan; | TA/U/AES |



62

| | | |
|---|---|---|
| 2 | Arrival of USDA/PASA Data Processing/Computer Specialist; | TA |
| 2 | Review preliminary findings from farm verification surveys and progress report on initial policy studies identified in policy reform program, APC project; | TA/U/AES |
| 2 | Host Country Personal Service Contracts for Economist and Statistician approved | MALR/USAID |
| 2 | Participants identified for short term training | U/AES |
| 3 | Review tranche two benchmarks | USAID |
| 3 | Annual work plan for data processing/ computer and training activities drafted/ reviewed | TA/U/AES |
| 3 | Commodity procurement plan drafted/reviewed of data processing/computer equipment and motorcycles; | TA/U/AES |
| 3 | T.A. team for organizational assessment for U/AES initiated; | U/AES/USAID |
| 3 | APA component FY 88/89 financial plan drafted | U/AES/TA |
| 3 | Baseline sector assessment work plan initiated by U/AES; | U/AES/USAID |
| 3 | Project Paper Amendment approved/funding authorized; | MALR/USAID |
| 3 | RFTP drafted and approved for APAC/T.A. contract; | U/AES/USAID |
| 3 | Administrative Staff for APAC hired | U/AES |
| 3 | Technical workshop for baseline sector assessment activities; | TA/U/AES |
| 3 | Baseline evaluation SOW developed for APA Component held in conjunction with the DCA final evaluation; | U/AES/USAID |
| 3 | Arrival of first year consultants HCPSC's (1 yr); | TA |
| 3 | Short-term studies identified under tranche two; negotiations underway for APC project; | U/AES |
| 3 | Annual work plan for Computer and Data Processing activities approved by USAID and U/AES. | TA/U/AES |



628

| | | |
|---|---|---|
| 3 | IFB's for procurement of vehicles, computers, copying machines for APA first year activities approved by MALR and USAID | TA |
| 3 | PIO/P completed for Short technical training. | TA/U/AES |
| 3 | IFB issued for procurement of vehicles and computers | USAID |
| 3 | Technical training participants approved | 1/23/88 |
| 3 | Computer Center work plan drafted by T.A. team/reviewed by U/AES and USAID | TA |
| 3 | T.A. to develop first years training plan for APA component participants and English training; | TA |
| 4 | Annual work plan for HCPSC Statistician approved by USAID and U/AES, MALR; | TA/U/AES |
| 4 | Annual work plan for Economist approved by USAID, U/AES, MALR; | TA/U/AES |
| 4 | U/AES technical committee for the APA Component formed; | U/AES/AID |
| 4 | Review RFTPs for APA T.A. contract | U/AES/USAID |
| 4 | Progress meeting to review baseline sector assessment, U/AES and USAID; | TA/U/AES |
| 4 | Review recommendations in reorganizational assessment study; | U/AES/USAID |
| 4 | T. A to develop renovation plan of headquarter office and field offices completed; | TA |
| 4 | Technical workshop for statistical and /or data processing; | TA/U/AES |
| 4 | T.A. to assist in data base development plan for data processing; | TA |
| 4 | In-country computer training for data processing staff initiated; | TA/U/AES |
| 4 | Review and update APA implementation schedule for years 2 to 6; | U/AES/USAID |
| 4 | In-country training for Policy staff | TA/U/AES |

FY 89

| | |
|---|---|
| 1 | Tranche three verification begins |
| 1 | Computer Training, U/AES initiated for software programs |
| 1 | Technical workshops for policy and statistics |
| 1 | Draft work plan and commodity needs, training, and T.A. for information support center |
| 1 | T.A. contract proposals reviewed and contractor selected |
| 1 | Review data base development plan |
| 1 | T.A. contract negotiations |
| 1 | Review training plan for participants |

1 AID review of host country contract for T.A. team
1 Review renovation plan for headquarters and field offices.
1 T.A. contract awarded
1 Policy technical committee meets, review progress on policy studies and new proposals
1 Arrival of T.A. team
2 In-country training for policy staff
2 Work plan for T.A. team developed and reviewed
2 Review progress made on tranche three benchmarks, verification and policy studies
2 Policy conference, commodity outlook and situation
2 Installation of computers in U/AES and field offices
3 Commodity - outlook situation programs initiated
3 Policy technical committee meeting, review progress on policy studies and review new proposals
3 Technical workshops for statistics and policy staff
3 In-country training statistics
3 T.A. team prepares quarterly progress reports, reviewed by U/AES and USAID
3 Implement office renovation plan for U/AES and field offices
4 T.A. team progress report reviewed by U/AES & USAID
4 In-country training for computer staff
4 Training program developed for commodity outlook situation programs
4 Policy workshop initiated

FY 90

1 T.A. team progress report review
1 Technical workshop for policy
1 T.A. Team Quarterly Progress Report reviewed by U/AES and USAID
1 T.A. annual work plan reviewed by USAID and MOA.
2 Mid-term progress evaluation initiated
2 T.A. annual work plan approved by USAID and U/AES, MALR.
2 Commodity outlook and situation conference
2 Technical workshop for statistics
2 In-country training for data processing
2 T.A. team quarterly progress report reviewed by U/AES and USAID
3 Policy technical committee meeting
3 Technical workshop/data processing
3 T.A. Team Quarterly Progress Report reviewed by
4 Technical workshop/policy
4 In-country training/commodity outlook
4 Return of long-term academic training participants
4 T.A. Team Quarterly Report Review
4 Mid-term evaluation SOW approved, IQC firm requested.

FY 91

1 Contractors annual work plan drafted for FY 91
1 Annual work plan approved by USAID and U/AES, MOA
1 Policy technical committee review of policy studies
2 Commodity outlook-situation conference
2 Technical training workshops
2 In-country training
2 T.A. Team quarterly report review
2 Agricultural census plan
3 Policy workshop
3 Policy technical committee review of policy studies
3 T.A. team quarterly report review
4 In-country training
4 T.A. Team quarterly report review

FY 92

1 Contractors annual work plan drafted for FY 92
1 Annual work plan approved by USAID and U/AES, MOA
1 Policy technical committee review of policy studies
2 Commodity outlook-situation conference
2 Technical training workshops
2 In-country training
2 T.A. Team quarterly report review
2 Agricultural census plan
3 Policy workshop
3 Policy technical committee review of policy studies
3 T.A. team quarterly report review
4 In-country training
4 T.A. Team quarterly report review

FY 93

1 Contractors annual workplan drafted
1 Scope of Work for final evaluation drafted
1 Contractor annual work plan approved by USAID and U/AES
2 Conference schedule on policy reforms drafted.
2 Technical Workshop
2 In-country training
3 T.A. Team quarterly report review
3 Outlook situation conference
3 T.A. Team quarterly review
3 Technical workshop
4 Final evaluation completed and reviewed by USAID and MOA
4 Review Chief of Party, draft end of tour report and project completion report
4 End of tour report and project completion report submitted for USAID review and U/AES, MOA.

B. Contracting Plan

1. Contracting Methods

a. Major Responsibilities

The Agricultural Policy Analysis Component will be implemented over a six year period. Technical assistance for policy analysis, statistics and data processing will be provided through several contract modes. Technical assistance in the area of data processing and computer programing will be supplied by an AID-funded PASA with the United States Department of Agriculture for the first two years. The general contractor will be acquired through a Host Country Contract with a U.S. firm selected through the competitive selection procedures set forth in AID Handbook 11, Chapter 1. This contractor will participate in the Generic PASA with the United States Department of Agriculture. This PASA will require institutional linkages with USDA and will be used to provide only short-term technical assistance in specialized program areas not available through the private sector.

The management of the APA component financed by the NARP will be the responsibility of the Undersecretariat of Agricultural Economics and Statistics, which, along with any additional designee(s), will be the authorized project representative(s) for the APA component. The annual work and financial plans, approved by the NARP steering committee and by USAID, will provide details on planned expenditures. Essentially these work plans will outline items to be dollar financed, and those items in which dollars will be used for local currency program support. The plans will also show planned GOE contributions, either directly or in-kind. The annual work and financial plans will identify specific institutions and persons responsible for major activities. The information below spells out how the component's contractors and the U/AES will work together.

b. Contracting Modes and Contractor Responsibilities

(1) The General Contractor

In the latter part of CY 1988, the component will secure the services of a U.S.-based, competitively-procured General Contractor (GC). The GC will be responsible for the providing technical advisory services, training and commodity procurement. The GC may subcontract with a procurement agent to complete services for commodity procurement if the contractor can demonstrate this is in the interests of the project. The GC will assist in planning the services to be financed with local currencies under dollar funding.



63

The GC may be authorized to administer these funds used to support contracted services for which she/he is responsible. The GC will provide four long-term resident advisors and approximately 100 p.m. of U.S. and Egyptian short-term technical assistance and coordinate other short term technical assistance with USDA. A policy economist, production economist, statistician, management specialist and information/media specialist would be required under TA. There is a possibility that during the end of the second year the general contractor will provide long-term technical assistance for a data processing computer center with a requirement for a computer specialist.

The general contractor will be responsible for offshore training, and he/she will be expected to work through USDA and the USDA/PASA in carrying out these activities. In-country training will be coordinated by the general contractor in collaboration with GOE academic institutions.

The GC will also be responsible for assistance in organizing studies, workshops, observation tours, invitational travel or information dissemination activities as requested by U/AES, with the concurrence MALR. The GC will provide local consultants, U.S. consultants and logistic support for the consultants.

(2) USDA PASA's

In late CY 1987, a two year USDA/PASA was authorized providing technical assistance in data processing, training and developing specifications for commodities related to data processing. The data processing specialist will assist in the establishment of a data processing center for the U/AES. The data processing specialist will organize, direct, and train the staff of the computer center and will lead, develop, and assist the designated U/AES manager of the center. He will coordinate the efforts of the staff and short-term technical assistance coordinators in microcomputer training, data base development and management, software training and adaptation to agricultural survey processing, standardization of codes and procedures, hardware configuration modifications, and trouble shooting. The data processing specialist will coordinate his efforts with the general contractor.

(3) Generic PASA

Due to the wide range of short-term consultant services needed in specialized and technical areas, the APA component will participate in a generic PASA with USDA. This type of PASA will be used to sponsor USDA in-country training courses and short-term consultants not available from the private sector or through the GC to support ongoing programs with ERS/USDA and NASS.

A primary reason for requesting a generic PASA with USDA is to acquire specialized technical assistance from USDA which cannot be acquired from the private sector. U/AES is reorganizing its undersecretariat to incorporate programs implemented under USDA/Economic Research Service (ERS) which will require specialized assistance in development of commodity outlook programs, objective yield forecasting, and census planning.

The USDA is a federal agency and cannot be a subcontractor to the GC, however USDA staff are able to develop work programs under the joint guidance for the U/AES and the GC in areas of economic analysis, data processing and statistics.

(4) Host Country Personal Service Contracts

Since the general contractor will not place advisory staff in Egypt until late 1988, U/AES will contract for an economist and a statistician for one year to initiate technical assistance in the areas of policy monitoring, decision support, statistical programs, and surveys. Host country contracts are the preferred mode of contracting rather than direct USAID PSC's to reduce logistics burdens on USAID. If a HCPSC is not feasible the project may decide to do a buy-in to a centrally funded project to supply appropriate technical assistance for a period of six to nine months. Scopes of work for two individuals and general job descriptions are provided in Annex B.

(5) Other U.S. Contracts

Over the course of project implementation, there will be several USAID direct contracts with IQC firms or centrally-funded AID projects to conduct specialized training courses or studies. The Agricultural Policy Analysis Project or the Center for Privatization are two central AID projects which could be utilized.

(6) Commodities

Offshore procurement with the exception of motorcycles and vans will be purchased through the prime contractor or subcontractor.

Procurement of vans and motorcycles will take place through IFBs prepared by the short-term technical assistance contractor.

Procurement of local commodities will be made by the host government utilizing AID-financed procurement procedures established in Handbook 11, Chapter 3. Prior AID approval is required for all commodity procurement awards in excess of an Egyptian pound equivalent of $100,000.

(7) In-country Seminar

a. Hiring of Local Staff

A cadre of semi-professionals will be hired as substitutes for the regular economic, statistical and data processing staff at U/AES while the latter are undergoing long-term and short-term training. Additional staff members will be hired with project funds to assist with implementing project activities involving the computer center, staff analysis and management. AID will finance these additional staff during the first five years of their employment with the project, after which the GOE may establish permanent position for these employees and absorb their cost in M/LR's recurrent budget. The general contractor will be used to hire temporary staff.

C. Cost Estimates and Financial Plan

1. Cost Estimates and Financial Plan

Total costs (Table 1) of this component are estimated at $5.6 million. AID will provide a grant of $21.6 million, Table 1. The GOE contribution will be $628,000 in cash plus $4.0 million in kind, Table 2.

a. Cost Estimates

Tables 3, 4, 5, and 6 provide detailed information on estimated expenditures for technical assistance, training, commodities, and services. The cost estimates used in this paper were developed from a historical analysis of cost data used in implementing other AID projects. The cost coefficients used are given in each Table.

Current costs (1987 prices) of local items were adjusted for a rate of inflation at 15% for 1988, 12% for 1989, 10% for 1990, and 8% for 1991 thru 1993. Adjustments were also made to reflect anticipated fluctuations in the exchange rate for purchase of LE with AID dollars; rates used are 1987: LE. 2.20, 1988: LE 2.42, 1989: LE 2.64, 1990: LE. 2.90, and 1991 thru 1993: LE 3.00. A compound inflation rate of 5% was used on the dollar funded items . These inflation and exchange rate adjustments are presented in Table 1 under the inflation line item. A contingency line item is also presented in Table 1 of 5%.

TABLE 1

**NATIONAL AGRICULTURAL RESEARCH PROJECT**
**(263-0152)**
**AMENDMENT NO. 2**

**POLICY ANALYSIS COMPONENT**
**COST ESTIMATE**
**($000)**

**PROJECTION OF EXPENDITURES BY FISCAL YEARS**

| | FY89 | | FY90 | | FY91 | | FY92 | | FY93 | | FY94 | | TOTAL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | TOTAL |
| **TECHNICAL ASSISTANCE** | 1,962 | 144 | 1,740 | 180 | 1,410 | 180 | 1,305 | 180 | 1,215 | 180 | 840 | 180 | 8,472 | 1,044 | 9,516 |
| LONG TERM | 672 | 144 | 840 | 180 | 840 | 180 | 840 | 180 | 840 | 180 | 840 | 180 | 4,872 | 1,044 | 5,916 |
| SHORT TERM | 1,290 | 0 | 900 | 0 | 570 | 0 | 465 | 0 | 375 | 0 | 0 | 0 | 3,600 | 0 | 3,600 |
| **TRAINING** | 357 | 192 | 596 | 166 | 660 | 160 | 398 | 152 | 90 | 150 | 50 | 148 | 2,151 | 968 | 3,119 |
| LONG TERM | 120 | 0 | 225 | 0 | 300 | 0 | 200 | 0 | 40 | 0 | 0 | 0 | 885 | 0 | 885 |
| SHORT TERM | 237 | 192 | 371 | 166 | 360 | 160 | 198 | 152 | 50 | 150 | 50 | 148 | 1,266 | 968 | 2,234 |
| **COMMODITIES** | 0 | 0 | 1,981 | 87 | 0 | 23 | 0 | 23 | 0 | 23 | 0 | 18 | 1,981 | 174 | 2,155 |
| OFFICE EQUIPMENT / SUPPLIES | 0 | 0 | 640 | 82 | 0 | 18 | 0 | 18 | 0 | 18 | 0 | 18 | 640 | 154 | 794 |
| VEHICLES (VANS & MOTORCYCLES) | 0 | 0 | 1,142 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,142 | 0 | 1,142 |
| INFORMATION DISSEM. EQUIP. | 0 | 0 | 59 | 5 | 0 | 5 | 0 | 5 | 0 | 5 | 0 | 0 | 59 | 20 | 79 |
| FIELD EQUIPMENT | 0 | 0 | 140 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 140 | 0 | 140 |
| **SERVICES** | 0 | 631 | 0 | 665 | 0 | 449 | 0 | 384 | 0 | 318 | 0 | 318 | 0 | 2,765 | 2,765 |
| COTRACT TECHNICAL STUDIES | 0 | 318 | 0 | 318 | 0 | 318 | 0 | 318 | 0 | 318 | 0 | 318 | 0 | 1,908 | 1,908 |
| TRAVEL | 0 | 183 | 0 | 137 | 0 | 91 | 0 | 46 | 0 | 0 | 0 | 0 | 0 | 457 | 457 |
| MAINTENANCE | 0 | 40 | 0 | 30 | 0 | 20 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 100 | 100 |
| ADMINISTRATION | 0 | 40 | 0 | 30 | 0 | 20 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 100 | 100 |
| OFFICE RENOVATION | 0 | 50 | 0 | 150 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 200 | 200 |
| **SUB-TOTAL** | 2,319 | 967 | 4,317 | 1,098 | 2,070 | 812 | 1,703 | 739 | 1,305 | 671 | 890 | 664 | 12,604 | 4,951 | 17,555 |
| CONTINGENCIES 5% | 116 | 48 | 216 | 55 | 104 | 41 | 85 | 37 | 65 | 34 | 45 | 33 | 630 | 248 | 878 |
| INFLATION | 116 | 106 | 442 | 192 | 326 | 170 | 367 | 215 | 361 | 254 | 303 | 314 | 1,915 | 1,252 | 3,167 |
| **TOTAL** | 2,551 | 1,122 | 4,975 | 1,345 | 2,500 | 1,023 | 2,155 | 991 | 1,731 | 959 | 1,237 | 1,012 | 15,149 | 6,451 | 21,600 |

TABLE 3

**NATIONAL AGRICULTURAL RESEARCH PROJECT**
**(263-0152)**
**AMENDMENT NO. 2**

**POLICY ANALYSIS COMPONENT**
**TECHNICAL ASSISTANCE COST ESTIMATE**
**($000)**

**PROJECTION OF EXPENDITURES BY FISCAL YEARS**

| SPECIALIZATION | NO. OF MAN MONTH | COST PER MAN MONTH | | TOTAL | | FY89 | | FY90 | | FY91 | | FY92 | | FY93 | | FY94 | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | |
| **LONG TERM** | 348 | | | 4,872 | 1,044 | 672 | 144 | 840 | 180 | 840 | 180 | 840 | 180 | 840 | 180 | 840 | 180 | 5,916 |
| AGRICULTURE ECONOMICS | 72 | 14 | 3 | 1,008 | 216 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 1,224 |
| AGRICULTURE/INFORMATION ECONOMICS | 60 | 14 | 3 | 840 | 180 | 0 | 0 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 1,020 |
| STATISTICIAN | 72 | 14 | 3 | 1,008 | 216 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 1,224 |
| DATA PROCESSING SPECIALIST | 72 | 14 | 3 | 1,008 | 216 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 1,224 |
| MANAGEMENT ADVISOR | 72 | 14 | 3 | 1,008 | 216 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 1,224 |
| **SHORT TERM** | 240 | | | 3,600 | 0 | 1,290 | 0 | 900 | 0 | 570 | 0 | 465 | 0 | 375 | 0 | 0 | 0 | 3,600 |
| *ECONOMICS* | | | | | | | | | | | | | | | | | | |
| MONITORING AND EVALUATION | 18 | 15 | 0 | 270 | 0 | 120 | 0 | 45 | 0 | 45 | 0 | 30 | 0 | 30 | 0 | 0 | 0 | 270 |
| PRIVATIZATION(PBADC) & POLICY REFORM | 11 | 15 | 0 | 165 | 0 | 120 | 0 | 45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 165 |
| SITUATION AND OUTLOOK | 12 | 15 | 0 | 180 | 0 | 45 | 0 | 45 | 0 | 45 | 0 | 30 | 0 | 15 | 0 | 0 | 0 | 180 |
| INSTITUATIONAL STUDY | 17 | 15 | 0 | 255 | 0 | 105 | 0 | 45 | 0 | 30 | 0 | 30 | 0 | 45 | 0 | 0 | 0 | 255 |
| SECTOR ASSESSMENT | 22 | 15 | 0 | 330 | 0 | 225 | 0 | 45 | 0 | 30 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 330 |
| POLICY ANALYSIS | 16 | 15 | 0 | 240 | 0 | 105 | 0 | 90 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 0 | 0 | 240 |
| INVITED PAPERS/SPEAKERS | 5 | 15 | 0 | 75 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 0 | 0 | 75 |
| TRADE POLICY | 10 | 15 | 0 | 150 | 0 | 45 | 0 | 45 | 0 | 30 | 0 | 15 | 0 | 15 | 0 | 0 | 0 | 150 |
| LIVESTOCK ECONO./ANALYST | 5 | 15 | 0 | 75 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 0 | 0 | 75 |
| *STATISTICS/DATA PROCESSING* | | | | | | | | | | | | | | | | | | |
| PRODUCTION COST ESTIMATE | 6 | 15 | 0 | 90 | 0 | 15 | 0 | 30 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 0 | 0 | 90 |
| SAMPLING STATISTICIAN | 17 | 15 | 0 | 255 | 0 | 90 | 0 | 75 | 0 | 30 | 0 | 30 | 0 | 30 | 0 | 0 | 0 | 255 |
| SURVEY STATISTICIAN | 23 | 15 | 0 | 345 | 0 | 105 | 0 | 105 | 0 | 75 | 0 | 45 | 0 | 15 | 0 | 0 | 0 | 345 |
| SYSTEMS ENGINEER | 6 | 15 | 0 | 90 | 0 | 15 | 0 | 30 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 0 | 0 | 90 |
| COMPUTER SYSTEMS ANALYST | 8 | 15 | 0 | 120 | 0 | 30 | 0 | 30 | 0 | 30 | 0 | 15 | 0 | 15 | 0 | 0 | 0 | 120 |
| OBJECTIVE YIELD SPECIALIST | 18 | 15 | 0 | 270 | 0 | 75 | 0 | 60 | 0 | 60 | 0 | 45 | 0 | 30 | 0 | 0 | 0 | 270 |
| MICRO-COMPUTER SPECIALIST | 6 | 15 | 0 | 90 | 0 | 15 | 0 | 30 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 0 | 0 | 90 |
| DATA BASE MANAG.SPECIALIST | 12 | 15 | 0 | 180 | 0 | 60 | 0 | 60 | 0 | 15 | 0 | 30 | 0 | 15 | 0 | 0 | 0 | 180 |
| SOFTWARE TRG. SPECIALIST | 7 | 15 | 0 | 105 | 0 | 30 | 0 | 30 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 0 | 0 | 105 |
| UNSPECIFIED | 5 | 15 | 0 | 75 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 0 | 0 | 75 |
| *INFORMATION/ADMINISTRATION* | | | | | | | | | | | | | | | | | | |
| INFO. DISSEMINATION TECH. ASSIST. | 8 | 15 | 0 | 120 | 0 | 0 | 0 | 30 | 0 | 30 | 0 | 30 | 0 | 30 | 0 | 0 | 0 | 120 |
| TRAINING &ADMINISTRATION TECH ASSIST | 6 | 15 | 0 | 90 | 0 | 15 | 0 | 15 | 0 | 30 | 0 | 15 | 0 | 15 | 0 | 0 | 0 | 90 |
| FEASIBILITY STUDIES | 2 | 15 | 0 | 30 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| **TOTAL** | 588 | | | 8,472 | 1,044 | 1,962 | 144 | 1,740 | 180 | 1,410 | 180 | 1,305 | 180 | 1,215 | 180 | 840 | 180 | 9,516 |

NATIONAL AGRICULTURAL RESEARCH PROJECT
(263-0152)
AMENDMENT NO. 2

POLICY ANALYSIS COMPONENT
TRAINING COST ESTIMATE
($000)

PROJECTION OF EXPENDITURES BY FISCAL YEARS

| ILLUSTRATIVE TRAINING PROGRAM | NUMBER OF PARTICIPANTS POLICY | STAT. | INFO/ADM. | TRAINING MONTH(T.M) | COST PER T.M. US$ | LC | TOTAL US$ | LC | FY89 US$ | LC | FY90 US$ | LC | FY91 US$ | LC | FY92 US$ | LC | FY93 US$ | LC | FY94 US$ | LC | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LONG TERM TRAINING | 7 | 7 | 2 | 354 | | | 885 | 0 | 120 | 0 | 225 | 0 | 300 | 0 | 200 | 0 | 40 | 0 | 0 | 0 | 885 |
| *DOCTORAL STUDIES* | | | | | | | | | | | | | | | | | | | | | |
| COMPLETION OF DCA PROJECT STUDIES | 0 | 4 | 0 | 66 | 2.5 | 0.0 | 165 | 0 | 120 | 0 | 45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 165 |
| *MASTERS STUDIES* | | | | | | | | | | | | | | | | | | | | | |
| AGR. ECONOMICS (PRICE POLICY) | 1 | 0 | 0 | 28 | 2.5 | 0.0 | 70 | 0 | 0 | 0 | 30 | 0 | 30 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 70 |
| AGR. ECONOMICS (MARKETING) | 1 | 0 | 0 | 28 | 2.5 | 0.0 | 70 | 0 | 0 | 0 | 30 | 0 | 30 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 70 |
| AGR. ECONOMICS (TAX POLICY) | 1 | 0 | 0 | 28 | 2.5 | 0.0 | 70 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 30 | 0 | 10 | 0 | 0 | 0 | 70 |
| AGR. ECON.(RESOURCE CONSERVAT. POL.) | 1 | 0 | 0 | 28 | 2.5 | 0.0 | 70 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 30 | 0 | 10 | 0 | 0 | 0 | 70 |
| STATISTIC DATA MANAGEMENT | 0 | 1 | 0 | 28 | 2.5 | 0.0 | 70 | 0 | 0 | 0 | 30 | 0 | 30 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 70 |
| SYSTEM MANAGEMENT | 0 | 1 | 0 | 28 | 2.5 | 0.0 | 70 | 0 | 0 | 0 | 30 | 0 | 30 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 70 |
| MATHEMATICAL STATISTICS (SAMPLING) | 0 | 1 | 0 | 28 | 2.5 | 0.0 | 70 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 30 | 0 | 10 | 0 | 0 | 0 | 70 |
| DEVELOPMENT COMMUNICATIONS | 0 | 0 | 1 | 28 | 2.5 | 0.0 | 70 | 0 | 0 | 0 | 30 | 0 | 30 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 70 |
| BUSINESS ADMINISTRATION | 0 | 0 | 1 | 28 | 2.5 | 0.0 | 70 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 30 | 0 | 10 | 0 | 0 | 0 | 70 |
| *POST DOCTORAL* | | | | | | | | | | | | | | | | | | | | | |
| PRIVATIZATION | 1 | 0 | 0 | 12 | 2.5 | 0.0 | 30 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| AGR. CREDIT POLICY | 1 | 0 | 0 | 12 | 2.5 | 0.0 | 30 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| LAND REFORM POLICY | 1 | 0 | 0 | 12 | 2.5 | 0.0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 30 |
| SHORT TERM TRAINING | 49 | 567 | 24 | 1,252 | | | 1,266 | 968 | 237 | 192 | 371 | 166 | 360 | 180 | 198 | 152 | 50 | 150 | 50 | 148 | 2,234 |
| *POST MASTERS* | | | | | | | | | | | | | | | | | | | | | |
| AGR. ECONOMICS (POLICY ANALYSIS) | 1 | 0 | 0 | 6 | 5.0 | 0.0 | 30 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| AGR. ECONOMICS (MARKETING) | 1 | 0 | 0 | 6 | 5.0 | 0.0 | 30 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| AGR. ECONOMICS (PRICE POLICY) | 1 | 0 | 0 | 6 | 5.0 | 0.0 | 30 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| AGR. ECONOMICS(EXPORT/IMPORT POLICY) | 1 | 0 | 0 | 6 | 5.0 | 0.0 | 30 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| AGR. ECONOMICS (CREDIT) | 1 | 0 | 0 | 6 | 5.0 | 0.0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 30 |
| STATISTICS (SAMPLING) | 0 | 1 | 0 | 6 | 5.0 | 0.0 | 30 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| STAT./DATA PROC.(COMPUTER MGT.) | 0 | 1 | 0 | 6 | 5.0 | 0.0 | 30 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| STAT./DATA PROC.(DATA BASE MGT.) | 0 | 1 | 0 | 6 | 5.0 | 0.0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 30 |
| *TECHNICAL TRAINING* | | | | | | | | | | | | | | | | | | | | | |
| ECON. ANALY. OF FERTILIZER UTILIZAT. | 1 | 0 | 0 | 2 | 5.5 | 0.0 | 11 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| PRIVATIZAT. IN DEVELOPING COUNTRIES | 1 | 0 | 0 | 2 | 5.5 | 0.0 | 11 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| AGRICULTURAL POLICY SEMINAR | 1 | 0 | 0 | 2 | 5.5 | 0.0 | 11 | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| SMALL FARMER CREDIT POLICY & ADMIN. | 1 | 0 | 0 | 2 | 5.5 | 0.0 | 11 | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| DEVELOPING MARKETS FOR AGR. PRODUCTS | 1 | 0 | 0 | 2 | 5.5 | 0.0 | 11 | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| ECON. FORECASTING FOR AGR. POLICY AND DECISION MAKING | 2 | 0 | 0 | 4 | 5.5 | 0.0 | 22 | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 22 |
| MICROCOMPUTER APPLICAT. IN AGR. DEV. | 0 | 3 | 0 | 6 | 5.5 | 0.0 | 33 | 0 | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 33 |
| BASIC AGR. SURVEY STAT. & METHODS | 0 | 6 | 0 | 12 | 5.5 | 0.0 | 66 | 0 | 33 | 0 | 22 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 66 |
| DATA PROC. MANAGERIAL SKILLS | 0 | 1 | 0 | 2 | 5.5 | 0.0 | 11 | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| SYSTEM ENGINEERING | 0 | 2 | 0 | 4 | 5.5 | 0.0 | 22 | 0 | 0 | 0 | 11 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 |
| ESTABLISHING DATA BASES & ANALYTICAL | 0 | 2 | 0 | 4 | 5.5 | 0.0 | 22 | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 22 |
| SYSTEMS FOR ECONOMIC DECISION MAKING IN AGR. | | | | | | | | | | | | | | | | | | | | | |
| INFORMATIONAL MANAGEMENT SYSTEM | 0 | 0 | 4 | 6 | 5.5 | 0.0 | 44 | 0 | 0 | 0 | 22 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 44 |
| ISPC-STATISTICS | 0 | 4 | 0 | 24 | 5.5 | 0.0 | 132 | 0 | 22 | 0 | 44 | 0 | 44 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 132 |

TABLE 4

# TABLE 4
(cont.)

**NATIONAL AGRICULTURAL RESEARCH PROJECT**
(263-0152)
AMENDMENT NO. 2

**POLICY ANALYSIS COMPONENT**
**TRAINING COST ESTIMATE**
($000)

PROJECTION OF EXPENDITURES BY FISCAL YEARS

| ILLUSTRATIVE TRAINING PROGRAM | NUMBER OF PARTICIPANTS | | | TRAINING MONTH(T.M) | COST PER T.M. | | TOTAL | | FY89 | | FY90 | | FY91 | | FY92 | | FY93 | | FY94 | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | POLICY | STAT. | INFO/ADM. | | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | |
| *OBSERVATIONAL* | | | | | | | | | | | | | | | | | | | | | |
| ON-JOB TRAINING AT USDA | 4 | 0 | 0 | 24 | 5.5 | 0.0 | 132 | 0 | 66 | 0 | 33 | 0 | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 132 |
| ON-JOB TRAINING AT UNIVERSITY | 8 | 0 | 0 | 16 | 5.5 | 0.0 | 88 | 0 | 0 | 0 | 22 | 0 | 33 | 0 | 33 | 0 | 0 | 0 | 0 | 0 | 88 |
| OBJECTIVE YIELD SCHOOLS | 0 | 6 | 0 | 6 | 5.5 | 0.0 | 33 | 0 | 11 | 0 | 11 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 33 |
| HANDS-ON EXPERIL BY COMPUTER STAFF | 0 | 12 | 0 | 12 | 5.5 | 0.0 | 66 | 0 | 0 | 0 | 22 | 0 | 33 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 66 |
| *IN-COUNTRY TRAINING* | | | | | | | | | | | | | | | | | | | | | |
| MANAGEMENT | 4 | 8 | 15 | 27 | 0.0 | 0.8 | 0 | 22 | 0 | 8 | 0 | 4 | 0 | 4 | 0 | 4 | 0 | 2 | 0 | 0 | 22 |
| STATISTICAL PROCEDURES | 0 | 40 | 0 | 20 | 0.0 | 0.8 | 0 | 16 | 0 | 12 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 16 |
| DATA PROCESSING | 5 | 60 | 5 | 35 | 0.0 | 0.8 | 0 | 28 | 0 | 16 | 0 | 8 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 28 |
| DATA ANALYSIS | 16 | 20 | 0 | 16 | 0.0 | 0.8 | 0 | 14 | 0 | 8 | 0 | 4 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 14 |
| FIELD STAFF | 0 | 400 | 0 | 960 | 0.0 | 0.8 | 0 | 768 | 0 | 128 | 0 | 128 | 0 | 128 | 0 | 128 | 0 | 128 | 0 | 128 | 768 |
| SEMINARS | 0 | 0 | 0 | 12 | 25.0 | 10.0 | 300 | 120 | 50 | 20 | 50 | 20 | 50 | 20 | 50 | 20 | 50 | 20 | 50 | 20 | 420 |
| TOTAL | 56 | 574 | 26 | 1,606 | | | 2,151 | 968 | 357 | 192 | 596 | 186 | 660 | 160 | 398 | 152 | 90 | 150 | 50 | 148 | 3,119 |

COST ASSUMPTIONS

1. SEMINARS-2 PER YEAR FOR 6 YEARS. ON AVERAGE BASIS 3 EXPATRIATES & 6 EGYPTIANS ARE ESTIMATED TO PROVIDE LECTURES IN EACH SEMINAR.

TABLE 5

NATIONAL AGRICULTURAL RESEARCH PROJECT
(263-0152)
AMENDMENT NO. 2

POLICY ANALYSIS
COMMODITY COST ESTIMATE
($000)

PROJECTION OF EXPENDITURES BY FISCAL YEARS

| ILLUSTRATIVE COMMODITIES ITEMS | NUMBER OF UNITS | | | COST PER UNIT | | TOTAL | | FY89 | | FY90 | | FY91 | | FY92 | | FY93 | | FY94 | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | POLICY | STAT | INFO/ADM | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | |
| **OFFICE EQUIPMENT / SUPPLIES** | 44 | 305 | 39 | | | 640 | 154 | 0 | 0 | 640 | 82 | 0 | 18 | 0 | 18 | 0 | 18 | 0 | 18 | 794 |
| COMPUTER,SOFTWARE,HARD DISK,TAPES | 9 | 76 | 5 | 5.0 | 0.0 | 450 | 0 | 0 | 0 | 450 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 450 |
| COPIER | 4 | 19 | 2 | 3.0 | 0.0 | 75 | 0 | 0 | 0 | 75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 75 |
| CALCULATORS | 10 | 100 | 4 | 0.5 | 0.0 | 57 | 0 | 0 | 0 | 57 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 57 |
| MICROFICHE & FACSIMILE | 1 | 1 | 1 | 3.0 | 0.0 | 9 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| TYPEWRITERS | 5 | 5 | 5 | 1.0 | 0.0 | 15 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 |
| BINDING MACHINES | 0 | 0 | 7 | 0.5 | 0.0 | 4 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| OFFICE FURNITURE | 14 | 100 | 14 | 0.0 | 0.5 | 0 | 64 | 0 | 0 | 0 | 64 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 64 |
| OFFICE SUPPLIES | 1 | 4 | 1 | 5.0 | 15.0 | 30 | 90 | 0 | 0 | 30 | 18 | 0 | 18 | 0 | 18 | 0 | 18 | 0 | 18 | 120 |
| **VEHICLES** | 50 | 159 | 1 | | | 1,142 | 0 0 | 0 | 0 | 1,142 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 0 | 1,142 |
| TRUCKS (PICKUP) | 0 | 10 | 0 | 18.0 | 0.0 | 180 | 0 | 0 | 0 | 180 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 180 |
| VANS | 0 | 29 | 1 | 23.0 | 0.0 | 690 | 0 | 0 | 0 | 690 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 690 |
| MOTORCYCLES | 50 | 120 | 0 | 1.6 | 0 | 272 | 0 | 0 | 0 | 272 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 272 |
| **INFORMATION DISSEMINATION EQUIPMENT** | 0 | 0 | 28 | | | 59 | 20 | 0 | 0 | 59 | 5 | 0 | 5 | 0 | 5 | 0 | 5 | 0 | 0 | 79 |
| VIDEO TAPE RECORDER/T.V. SETS | 0 | 0 | 5 | 2.0 | 0.0 | 10 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| VIDEO CAMERA, TRIPOD, ETC. | 0 | 0 | 5 | 2.0 | 0.0 | 10 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| OVERHEAD PROJECTOR | 0 | 0 | 5 | 0.6 | 0.0 | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 35MM CAMERA / FILMS | 0 | 0 | 5 | 1.5 | 0.0 | 8 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 |
| INSTRUCTION EQUIPMENT | 0 | 0 | 5 | 1.5 | 0.0 | 8 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 |
| REPRODUCTION EQUIPMENT | 0 | 0 | 2 | 5.0 | 0.0 | 10 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| REPRODUCTION SUPPLIES | 0 | 0 | 1 | 10.0 | 20.0 | 10 | 20 | 0 | 0 | 10 | 5 | 0 | 5 | 0 | 5 | 0 | 5 | 0 | 0 | 30 |
| **FIELD EQUIPMENT** | 0 | 401 | 0 | | | 140 | 0 | 0 | 0 | 140 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 140 |
| CONTROLLER AND DISK DRIVE | 0 | 1 | 0 | 100.0 | 0.0 | 100 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 100 |
| LARGE SCALES | 0 | 150 | 0 | 0.5 | 0.0 | 75 | 0 | 0 | 0 | 75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 75 |
| SMALL SCALES | 0 | 250 | 0 | 0.2 | 0.0 | 50 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 |
| OBJECTIVE YIELD EQUIPMENT | 0 | 1 | 0 | 15.0 | 0.0 | 15 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 |
| **TOTAL** | 94 | 865 | 68 | | | 1,981 | 174 0 | 0 | 0 | 1,981 | 87 | 0 | 23 | 0 | 23 | 0 | 23 | 0 | 18 0 | 2,155 |



65

TABLE 6

**NATIONAL AGRICULTURAL RESEARCH PROJECT**
(263-0152)
AMENDMENT NO. 2

POLICY ANALYSIS COMPONENT
SERVICES COST ESTIMATE
($000)

PROJECTION OF EXPENDITURES BY FISCAL YEARS

| ITEMS | FY89 | | FY90 | | FY91 | | FY92 | | FY93 | | FY94 | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | |
| CONTRACT TECHNICAL STUDIES | 0 | 318 | 0 | 318 | 0 | 318 | 0 | 318 | 0 | 318 | 0 | 318 | 1,908 |
| TRAVEL *** | 0 | 183 | 0 | 137 | 0 | 91 | 0 | 46 | 0 | 0 | 0 | 0 | 457 |
| MAINTENANCE *** | 0 | 40 | 0 | 30 | 0 | 20 | 0 | 10 | 0 | 0 | 0 | 0 | 100 |
| ADMINISTRATION *** | 0 | 40 | 0 | 30 | 0 | 20 | 0 | 10 | 0 | 0 | 0 | 0 | 100 |
| RENOVATION | 0 | 50 | 0 | 150 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 200 |
| TOTAL | 0 | 631 | 0 | 665 | 0 | 449 | 0 | 384 | 0 | 318 | 0 | 318 | 2,765 |

COST ASSUMPTIONS

1. CONTRACT TECHNICAL STUDIES: 6 STUDIES PER YEAR @ $50000/STUDY FOR 6 YEARS
2. TRAVEL: 300 HEADQUARTER STAFF @ 90 DAYS/YEAR @ $7/DAY TRANSPORTATION AND PER DIEM
3. MAINTENANCE: 20 GOVERNORATES @ $2000/YEAR
4. ADMINISTRATION: $40000/YEAR
5. RENOVATION: 20 GOVERNORATES @ $10000/GOVERNORATE

*** THESE OPERATIONAL COSTS WILL BE SHARED WITH MOA, THE ABOVE AMOUNTS REPRESENT AID CONTRIBUTION WHICH ACCOUNT FOR 100% IN YEAR 1, 75% IN YEAR 2, 50% IN YEAR 3, AND 25% IN YEAR 4.

(1) Chart on Methods of Implementation and Financing

Chart 1 lists the proposed methods of implementation and financing for the Agricultural Policy Analysis Component.

(2) Justification

No justification is required for using AID direct contracts or PILs. When a PIL is used as the financing instrument, AID may advance local currency purchased with project funds to the MALR to finance the local cost items. AID advances of local currency funds are necessary because of budgetary limits within MALR. Theoretically, eventhough an advance is provided by PIL, this method of financing is still considered one of the AID preferred methods.

The only financing method in this component which requires justification is the use of a Direct Letter of Commitment (D. L/COMM) as a payment mechanism for the host country general contractor under a host country contract for procurement of motorcycles and vans. The GOE has insufficient foreign exchange available to purchase the items and await reimbursement.

Therefore, an L/COMM must be used. The USAID Mission will use a Direct rather than a Bank L/COMM in order to maintain required oversight over the funds.

2. Local Cost Financing (Services) and the Annual Work and Financial Plan

a. Financial Plan

The component inputs, cost estimates and financial plan will specify an amount of dollar financing for local costs. Joint control of these funds will be exercised by USAID and the U/AES.

The annual work and financial plans (hereafter AWFP) will determine activities to be carried out and funded. The issuance of contracts and PIL's could also be used to commit the funds. Responsibility for preparation and approval of the AWFP rests with the U/AES's component manager. The advisory teams and the GC may assist in the preparation of the AWFP and would be required to agree to these portions of the AWFP for which they are tasked to carry out.

The AWFP will describe activities to be carried out by functional area and the division within U/AES or contractor responsible for the activity. The broad category of activity would include training, commodity procurement, field activities, and studies. The AWFP would identify the sources and amounts of financing needed for each proposed activity. (Sources would include the component's dollar elements, the dollars for financed local costs, or the GOE contribution).

Commitments may be made on a case by case basis for activities approved for implementation prior to the first AWFP. An approved AWFP may be amended by an exchange of letters between the U/AES and USAID, provided these changes are within limits agreed to by the NARP Coordinating Committee. The NARP coordinating committee will approve an annual budget with guidelines to establish authority for shifting funds among line items without referring the matter back to the NARP Coordinating Committee.

b. Disbursement Mechanisms

Disbursement of funds to host country contractors will be made through a Direct L/COMM. The contractors will submit monthly reimbursement vouchers SF 1034 (approved by MALR) to AID. AID will then reimburse the contractors for amounts represented by these vouchers. Advances may be authorized to nonprofit contractors and organizations.

All AID direct contractors will be paid directly by AID upon submission of the required invoices. Advances may be authorized to nonprofit contractors and organizations.

4. Recurrent Cost Issues

The line item for services on Table 6 represents local cost expenses which is not necessarily recurrent costs. Once the new system is put into place, recurrent costs will differ from the service line item. As an example, the substantial cost of monitoring policy reform in the early years of the project will not continue throughout the entire life of the component or even after the completion of the component. Sector performance indicators such as farm income, prices paid and received, and marketing information will be available through routine surveys by the end of the development effort, information not acquired by the relatively costly procedures currently being used in policy reform monitoring. Similarly, refurbishing and equipping governorate offices are an initial costly effort. This type of operating expense should be covered by a maintenance budget and incremental replenishment of items through regular appropriations and budgets.

Nevertheless, it is apparent that a properly-functioning agricultural statistics and policy analysis system will have substantially more recurrent costs than are presently being provided through the regular GOE budget. In part, the increases can be met through savings realized through the project. The current methods of carrying out surveys, particularly the agricultural census, require a complete enumeration or use of very large samples. This is very expensive and less accurate than using modern techniques with appropriately drawn small samples. Changing methods will result in a net savings in recurrent costs. Assuming that other public agencies or public sector companies have a need for data services, the U/AES might receive transfer payments from such groups, or charge a small fee for handling and reproduction costs associated with internal papers, statistical series, special reports, etc.

It is not possible, at this time, to fully estimate the savings or income which will minimize recurrent costs increases. In any event recurrent costs are likely to increase by approximately 15-20 percent above current levels. For current and subsequent several year projections, U/AES salary and operating expenses are averaging about 18 million LE. There are many claims on the MALR budget, and future increases in expenditures can be met by increased taxes and fees performed by U/AES.

## D. MONITORING AND EVALUATION PLAN

This component is an important element of USAID's agriculture sector strategy, and we propose a comprehensive monitoring and evaluation plan to include detailed coverage of policy reform benchmarks, sector performance, and the content and management of the APS component per se. Funds for short-term technical assistance to help establish specific benchmarks and determine timing of evaluation activities is included in the budget.

### 1. Component Monitoring

The management structure of this project relies on decentralized management, roles and responsibilities are clearly defined so that authority is placed as closely as possible with implementing entities at the operational level. The component will support the hiring of additional administrative staff within U/AES/MALR to assist with administrative, monitoring and coordinating responsibilities.

Within AID, the task of tracking progress in this component rests with an experienced direct hire AID Agricultural Development Officer (ADO)/Economist who will spend one third of his time on the administrative aspects of the component and another third of his time working with agricultural policy aspects of the project. This would include assisting in the design and review of studies and interpretation of results. The ADO will use the project committee and other USAID officers to assist him, as needed, with his monitoring responsibilities.

On an annual basis, or as needed, the AWAP will provide a reference from which progress can be measured. If through monitoring, implementation changes are suggested, amending the AWAP is the mechanism for adjusting the pace and nature of the activities being carried out.

Policy reform and agricultural development are ongoing processes which must be regularly monitored, evaluated and analyzed. Results are extremely important to individuals who implement policy reforms and to those involved in the decision-making process. The APA Component has dual objectives, both of which support the GOE agricultural reform policies; the first objestive is improving and disseminating information important to policy decision-making; and secondly, strengthening the capability of the U/AES office of the MALR to collect, process, and analyz data so that the GOE is able to effectively address critical economic and policy issues facing the agricultural sector.

In addition to the monitoring actions described above, the ADO will use different techniques to monitor the APA component, including site visits, analysis of financial reports, audits, review of contractor reports, and assess the quality and quantity of the component outputs.

B. Evaluations

Economic and policy monitoring which is described below, and the monitoring of "input/outputs" cited above provides evidence that monitoring will receive relatively more attention than evaluation. Two formal evaluation are planned over the life of this six year project: The first is scheduled in April 1990 and the second two months prior to the project component completion date in 1993. A baseline assessment will be done with the development of quantifiable impact indicators and measurements taken to ensure the existence of a baseline data. This will be done in conjunction with the DCA project final evaluation which will occur in FY 88, third quarter.

In addition to the two scheduled evaluations, annual reviews will be held to review the performance and progress achieved in meeting the



645

planned objectives. The GOE, AID and contractors will participate in these annual reviews. Regularly scheduled meetings will take place throughout the project with the steering and technical advisory committees. Quarterly contractor progress meetings, policy conferences and workshops are scheduled to discuss policy issues, and evaluate results and findings. These sessions will serve as forums for component monitoring and informal evaluation.

A variety of data will be generated in the normal course of project implementation. This data will be available for evaluations.

- economic and policy analysis and studies generated by the U/AES through its sector monitoring and evaluation activities, commodity specialist program and its quick response capability;

- findings from policy studies programs and workshops;

- national, governorate, and district level statistical data generated under the LSF methodology;

- quarterly progress reports prepared by the technical assistance teams;

- minutes of meetings of the steering and technical committees and recommendations from the reviews of the annual work plan policy conferences and workshops.

The following are general objectives for each of the two external evaluations, scheduled for the component.

1. <u>First Evaluation, (Oct-Nov 1990)</u>

This progress evaluation is scheduled at the end of the second project year. All technical advisors and commodities are scheduled to have arrived in country by the beginning of project year three. Therefore, sufficient progress will have taken place during year two in terms of project implementation to warrant an evaluation.

The first evaluation is a project management "audit", and the objective is to examine: (a) the adequacy of institutional arrangements, systems of operation, and work plans; and (b) progress achieved in providing inputs to the project. Necessary modifications to the project implementation schedule, institutional arrangements, and the financial plan will be made at this time. The following aspects of the project will be examined:

a. Adequacy of staffing within U/AES and field offices;

b. Institutional roles and working relationships within U/AES, other ministries and the Steering Committee; and other agencies involved in agricultural data collection and analysis; and all the long-term technical assistance contractors; and between AID and relevant GOE and governorate agencies;

c. The status of commodity procurement activities;

d. The status of progress in monitoring and evaluating policy benchmarks;

e. Preliminary results of the first policy studies;

f. The adequacy of counterparts for all long-term consultants; and

g. Progress in implementing the APA program.

2. Final Evaluation, 1993

This final evaluation is scheduled to coincide with the projected completion date of all project activities. The evaluation will measure the impact of the project in meeting policy objectives of the GOE, examination of lessons learned and progress achieved in meeting project goal and purpose and the end of project status (EOPS) indicators. Prior to this evaluation, clearly defined, quantifiable, impact indicators will have been developed for all project elements and activities. Evaluation of the training program, for example, will include such indicators as effectiveness of the bonding requirements, quality of the participants, the extent to which course material is utilized on the job, and the relevance and appropriateness of post training assignments for participants. The quality, timeliness, accuracy, and end use of the agricultural data generated under the new LSP methodology will be evaluated. The impact of the various policy studies and analysis conducted on agricultural policy will be assessed. An evaluation of the institutional arrangements involving the U/AES and the Steering Committee will be made. The relevance and quality of analysis will be evaluated in terms of its impact and influence on the decision-making process.

(3) Implementation of Evaluations

USAID, the MALR, and TA contract staff will share responsibilities for data collection. For surveys and special studies, USAID will contract directly with a U.S. firm, possibly under an 8-A set aside, through a USDA PASA, or other AID/W centrally funded projects related to policy analysis. It may be possible to work directly with an Egyptian social research firm. Mixed teams of USAID and GOE staff and consultant experts will conduct the midterm and final evaluations.

The evaluation and audit budget includes funds for these external contracts, and for technical assistance to help the MALR analyze the impact of planned policy reform measures.

VI. Training Plan

The achievement of the various outputs will require U/AES and other MALR staff to receive training in a number of areas depending upon the level of specification and job requirements. The technical directions and methodologies planned for the APA component require a technical and administrative reorientation for the professional counterpart staff engaged in the activity. During the initial years, almost all such personnel will receive some training. Training under the component is multidirectional and can be carried out through a variety of courses. Training can be divided into two general areas: administrative (project methodologies/procedures) and technical (advance training in areas of specialization). Training in both areas will be carried out either within Egypt, regionally, and in the U.S. Training is a continuous process, and the component will establish a relationship with regional entities and international institutions and universities and U.S. Government Agencies. The total training activity is budgeted at $3,727,000 including all the different training aspects - long-term, short-term, and in-country.

Table 7 provides a summary of the illustrative training programs. This program plan will be further refined during project implementation as training needs and in-country capacity is more fully assessed. A major assessment of training needs will be developed during the organizational assessment.

Table 7 Proposed Training Plan, Number of Participants

| Component Element | Policy | Statistics | Data Proc. | Information /Admin. |
|---|---|---|---|---|
| U.S. Long-Term | | | | |
| M.S. Degrees | 4 | 3 | 0 | 2 |
| U.S. Short-Term | | | | |
| Post Doctoral | 6 | 0 | 0 | 0 |
| Post Masters | 5 | 3 | 0 | 0 |
| Technical | 14 | 14 | 14 | 6 |
| Observational | 16 | 8 | 16 | 0 |
| In-Country | 34 | 250 | 213 | 23 |

A. In-Country Technical Training Activities

A significant in-country training effort will be mounted within Egypt including courses in: (1) monitoring and evaluation; (2) economic and policy analysis; (3) statistical methodologies and procedures; (4) data processing and collection; (5) management; and (6) information and dissemination techniques.

The in-country training will be carried out through special technical workshops and seminars arranged by the General Contractor. The in-country training activity is budgeted at $768,000 for 1190 training months.

B. Specialized Short-Term Training

As described in table 7 a total of 312 training months of specialized short-term training at the cost of $716,000 is envisioned for U/AES staff at U.S. universities, or through technical training at USDA. Costs for training outside of Egypt are based on person months estimates included in HB 10. The GOE finances the employees' salaries. Specialized training costs consist of: (1) travel costs and per diem; (2) tuition and academic costs; and (3) material/miscellaneous costs for supplies.

C. Long-Term External Degree Training

Since previous projects have provided external degree training, only limited numbers of U/AES staff will be sent for U.S. degrees under this component. A total of eight M.S. trainees and four Ph.D. trainees will be sent for advanced degree programs. This degree training is needed especially to prepare Egyptian staff members to continue their analytical and decision-support activities following the completion of the assistance provided in this component.

AGENCY FOR INTERNATIONAL DEVELOPMENT

Washington, D. C. 20523

# PROJECT PAPER

ANNEX L

EGYPT: National Agricultural Research (263-0152)

February 25, 1988



651

NARP Project:

TECHNOLOGY TRANSFER COMPONENT

Technical Paper

COPYEXTN. DOC 2/25/88

Table of Contents

PAGE

Table of Contents....i
Charts....ii
Appendices....iii
Acronyms....iv

I. Background and Rationale....1
A. Background....1
1. Historical Perspectives....1
2. Current Situation....4
3. The Problem....6
4. Institutional Framework of Technology Transfer System....8
B. Rationale....15
C. Relationships of Project....16

II. Detailed Description....17
A. Overview....17
1. Objectives....17
2. Definition....17
3. EOPS....18
4. Outputs....19
B. Elements, Activities & Inputs....19
1. The Technology Transfer System....20
2. Strengthening The Planning and Management Capability of ARC/EAD....21
o Program Planning and Management....21
o Action-Oriented Studies for Strengthening Technology Transfer....23
o Strengthening Training Infrastructure....24
o Strengthening Communication Support Infrastructure.25
o Decentralized Public Extension Service Improvement....26
o Governorate Plans and Proposals....27
3. Support for Non-Public Extension Services....29
4. Support to Programs Serving Special Groups....30
o Strengthening the Non-Public Extension Services....30
o Strengthening Institutional Capabilities....31
o Special Grants for Increasing Participation of Non-Public Extension Agency in Technology Transfer....32
o Public Extension Service and Non-Public Extension Agencies Links....32
o Strengthening the Research Community Technology Transfer Capability....33

Table of Contents (Con't.)

PAGE


- o Strengthening SMS capabilities.....34
- o Preparing Packages of Recommended Practices.....35
- o Creating Research/Extension Centers.....35
- o Research and Public Extension Service Links.....37
- o Research and Non-Public Extension Links.....37
- o Strengthening Feedback From Farmers.....37

C. Overview of Component Inputs.....38
1. Technical Assistance.....39
a. Long-Term TA.....39
b. Short-Term TA.....39
c. Specialized TA.....39
2. Training.....40
3. Commodities.....40
4. Office Renovation.....40
5. Grants.....40

III. Implementation Plan and Schedule.....41
A. Project Management.....41
1. GOE/USAID Project Management.....41
2. Annual Work and Financial Plans.....42
3. Procurement Plan.....42
B. Implementation by Element.....42
1. Technical assistance.....42
a. Long Term.....42
b. Short Term.....43
c. Decentralized Planning TA.....43
2. Training Plan.....44
a. Long Term.....44
b. Short Term.....45
C. Implementation Schedule.....48

IV. Cost Estimates and Financial Plan.....53
A. Cost Estimates.....53
B. Contracting Methods.....53
1. Technical Assistance.....53
2. Training.....54
3. Commodities.....54




COPYEXTN. Doc 2/25/88

64

## Charts

Chart No.1 Organizational Overview of Egyptian Agricultural Technology System.....10
Chart No.2 Egyptian Agricultural Technology Transfer System.....12
Chart No.3 Functional Chart of Technology Transfer System.....14
Chart No.4 Organizational Guide to Project Activities, Elements and Inputs.....20

## Appendices

1. Recommendations of the Agriculture Extension Consultants Work Group Arranged under Ministerial Law No. 5 for 1987.

2. Guidelines for Submitting Proposals for Innovative Program Grants, Non-Public Agency Grants and Special Group Programs.

3. Guidelines for Preparing and Submitting Governorate Technology Transfer Plans and Proposals.

4. Illustrative Action-Oriented Studies to be Done by AERDRI.

5. Scopes of Work for Long-term TA.

6. Selected References.

7. Overview of Non-Public extension Service Agencies.

8. Draft First Year In-Country Training Plan.

9. Detailed Budgets.



COPYEXTN. Doc 2/25/88

# ACRONYMS

| | |
|---|---|
| ADS | Agricultural Development Systems Project |
| AERDRI | Agricultural Extension Rural Development Research Institute |
| APC | Agricultural Production and Credit Project |
| ARC | Agricultural Research Center |
| ARC/EAD | ARC Extension Affairs Division |
| A.V. | Audio visual |
| CAAES | Central Administration for Agricultural Extension Service |
| CASE | Central Administration for Specialized Extension (SMSs) |
| CDSS | Country Development Strategy Statement |
| DCA | Data Collection and Analysis Project |
| EMCIP | Egypt Major Cereals Improvement Project |
| Feddan | 1.034 Acre |
| GOE | Government of Egypt |
| IADS | International Agricultural Development Service |
| IBRD | International Bank for Reconstruction and Development (World Bank) |
| IFAD | International Fund for Agricultural Development |
| IRR | Internal Rate of Return |
| MOA | Ministry of Agriculture |
| NARP | National Agricultural Research Project |
| NES | National (Agricultural) Extension Service |
| OICD | Office of International Cooperation and Development (USDA) |
| PBDAC | Principal Bank for Development and Agricultural Credit |
| PVOs | Private Voluntary Organizations (also known as Nongovernmental Organizations (NGOs) |
| PWWR | Public Works and Water Resources (formally the MOI) |
| R/E | Research/Extension Center |
| REC | Regional Extension Council |
| RRT | Rice Research and Training Project |
| S & T | Science and Technology |
| SCAE | Supreme Council for Agricultural Extension |
| SFPP | Small Farmer Production Project |
| SMS | Subject Matter Specialists (in the U.S., normally called Extension Specialists) |
| T & V | Training and Visit (Extension System) |
| TA | Technical Assistance |
| USAID | United States Agency for International Development |
| USDA | United States Department of Agriculture |
| VEW/VEA | Village Extension Worker/Village Extension Agent |



COPYEXTN. Doc 2/25/88

636

NARP Project

TECHNOLOGY TRANSFER COMPONENT

# I. Background and Rationale

## A. BACKGROUND

### 1. Historical Perspective

Through the centuries, Egyptian agriculture was a world success story because of rich land, water and hard working farmers. However, in recent times the limits on new land available for cultivation and continued use of traditional practices by farmers has held back Egypt's ability to feed its rapid growing population. The Government has been concerned with this situation for some time and has made efforts to strengthen agricultural research and the transfer of results to farmers.

In 1980, GOE established a Supreme Council for Agricultural Extension to serve as a policy and advisory body for strengthening technology transfer. The World Bank and USAID offered to assist the GOE in developing a national policy for agricultural extension. Both offers were accepted by the Government. In September 1981, a bank mission visited Egypt and prepared a report, "Strengthening of Agricultural Extension," which discussed how the Training and Visit (T&V) methodology could be introduced into Egypt. This was followed by a USAID extension mission in October 1981 headed by Dr. E.T. York. The two reports are complementary but, whereas the Bank's report concentrated on operation of the extension system at the village, district and governorate level, the AID report concentrated on reorganization at the national level. In addition to these two reviews, USAID and World Bank helped GOE conduct other detailed reviews on how to more effectively transfer agricultural technology from the research establishment to farmers. A list of the key documents is in Appendix 6, Annex O.

As a result of the recommendations given in the 1982 USAID Presidential Mission and the Extension Review (both headed by Dr. E.T. York), GOE through a Cabinet Degree in January 1983 merged the extension function under ARC so there would be an integration of research and technology transfer at the national level. It was anticipated that a USAID extension project to support this action would be funded shortly after the Decree. Unfortunately, the extension project was not funded and on the Egyptian side events occurred which delayed the shifting into ARC of the Central

Administration for Agricultural Extension Service (the national extension service administrative offices and communication support unit). Also, the Supreme Council never became a fully active body. At that time, the MOA was engaged in a major program for promoting increased use of agricultural mechanization and ensuring that government crop quotas were met. The extension service directed much of its efforts in support of these efforts. (This activity has now been removed from the extension service role.) Earlier expectations of a much strengthened and focused national extension service declined. Presently, a major effort has resurfaced for integrating the extension function with the research institutions and mobilizing the extension services in the governorates through a decentralized technology transfer system.

In the early 1980's a number of "first generation" USAID-financed projects focused on increasing productivity through individual commodities (i.e. various cereals or horticultural crops) or programs (i.e. small farmers credit, machinery) which included research, extension, supply inputs, marketing and other elements required for successful technology transfer and adoption by farmers. Through these projects much valuable experience was gained in how to organize the extension function in an agricultural development program.

Through these "first generation" projects, a variety of extension methods have been tested. Under the Small Farmer Production Project, information was treated as an input delivered to the farmer as part of an in kind credit package through the Principle Bank for Development and Agricultural Credit (PBDAC). The project concentrated in three governorates, and reached approximately 84,000 farmers. The project refined research results into commodity specific recommendations and used Subject Matter Specialists (SMSs) to train extension staff and provide farmer feedback to researchers. The Government has begun employing this model in six additional governorates and hopes to expand it even farther.

The Egyptian Major Cereals Improvement Project (EMCIP) and the Rice Research and Training Project both encouraged close research/extension linkages based on specific commodities. Research trials were established on farmers fields to test a number of different treatments. Demonstration areas were then developed, using a set of recommendations based on the successful treatments resulting from the trials. Field days, farmer visits, radio spots and printed materials were used by extension agents to get information to the farmers. Subject Matter Specialists (SMSs) were drawn from the ARC (and Faculties of Agriculture to a lesser extent) to provide technical training to the extension staff and provide farmers' feedback to the researchers.

This approach was effective in developing an appropriate set of technological packages for selected crops for farmer use; demonstrating to quite a large number of farmers, over a short period, the potential of applying the packages; and in training selected extension workers who were provided with attractive incentives to communicate the packages to farmers, using the demonstrations as their principal communications medium but also supplemented with audiovisual aids.

There was no attempt to build up a long-term institutional base of extension linked to research nor was there any attempt to respond to farmer demand across the wide spectrum of farming systems. Rather, these commodity/program specific projects acted in support of centralized Government planning aimed at increasing productivity in certain selected strategic crops and eventually led to what are now called "production campaigns". These programs, nevertheless, had important lessons for strengthening technology transfer as they demonstrated what could be achieved in terms of increased productivity with strong leadership, clear goals, solid technical base, and adequate resources.

The IFAD funded World Bank executed Minya Agricultural Development Project (ADP) has worked at creating an effective extension service at the governorate level. While the Minya ADP is confined to one governorate and has yet to be evaluated in depth, its apparent success, at a time when other efforts to develop improved extension services have failed, warrants examination. According to the World Bank some of the factors permitting the Minya ADP to make progress are:

(a) Historically, Minya has had a strong base of qualified expertise within the Governorate and strong administrative support both from within the Governorate and from Cairo.

(b) The technology transfer effort has been based on a clearly defined and understood Training and Visit (T&V) system of extension. Many farmers and most extension staff have a clear idea of what this new technique can offer both as a tool for better delivery of information packages, and as a direct means of increasing farmer production, thus gaining the respect of farmers and improving extension staff morale.

Problem areas for the Minya project include a low level research/extension relationship and a tendency to "pad" the extension service payroll with other MOA employees assigned to the Governorate. The number of governorate extension staff assigned to the project is roughly ten fold the number working prior to the project.

Other donor projects have worked with aspects of the agricultural extension service with less nationally visible impact. A major weakness in most of the projects, in terms of effective technology transfer, is that they have focused only on the public extension service. They do not take into account that:

(1) There are many different types of groups operating at the farmer level which are important to successful technology transfer;

(2) Linkages must be established with research institutions in ARC, other government agencies and non-government organizations for supporting these various intermediary groups; and

(3) Factors outside the technology transfer system can block adoption of new innovations by farmers (e.g., pricing policies, unsuitable research finding, rigid packages not adapted to agro-climatic areas, lack of input supply or credit, and inadequate marketing).

In addition to these donor assisted activities the private sector is becoming more involved in technology transfer. Professional associations and nonprofit societies provide information - usually on a commodity basis. PVOs, both international and indigenous, are also sources of information. Technical information is also available to farmers through commercial profit making companies and consulting service firms. Consultants are hired by large scale farmers (e.g., Tonsy Dairy farm has a contract with a Dutch firm) and commodity associations to a lesser degree.

Most information dissemination in the private agricultural sector is product advertising (such as the Pioneer Seeds' field days and Kuboka machinery billboards). As the growing market orientation proceeds, input dealers, e.g., fertilizer, pesticides, machinery, and seeds, will play an increasingly active role. Under this project component, these non-public extension service organizations in the public and private sector will be encouraged to become active participants in the technology transfer system.

2. Current Situation

Building on this previous experience, during 1987 a number of significant actions were taken by GOE to set the stage for a project to support the creation of an effective technology transfer system, with active participation of a wide variety of public and private sector organizations. One action taken by GOE

was to establish a Consultants Working Group on Agricultural Extension to study how to strengthen the extension function. This GOE report (see Appendix 1, Annex O) includes eight important recommendations. The first recommendation is to reactivate the Supreme Council on Agriculture Extension with participation of a wide variety of officials in MOA, other government units, non-government organizations, and farmers' representatives. Another important recommendation involves establishing Governorate Extension Councils with similar representation from the public and private sectors to develop and manage decentralized technology transfer programs. Other recommendations of the Group include establishing closer links between research and technology transfer agencies, strengthening training at all levels, and increasing the use of communications methods and mass media.

In June/July 1987 USAID fielded an Extension Design Team to go through previous studies and reviews done by donors and GOE, study current technology transfer activities at central and field levels, and recommend a strategy for strengthening technology transfer in Egypt and how NARP can support that effort. In addition to the overall assessment and recommendations, the team was asked to address two specific issues:

(1) Was the extension service engaged in regulatory and GOE production control programs? The team consulted officials at all levels, studied reports, and talked with village level workers and farmers. The GOE rules clearly state, and the GOE Consultants Group report reiterate and a AERDRI study on how extension workers spend their time substantiates, that extension workers are not to be involved in these regulatory activities. The team found no evidence of extension involvement in these programs. Michael Pease, World Bank Extension expert, in a similar review reported the same findings.

(2) Should USAID provide funds to private sector and/or mass media organizations rather than supporting the public sector extension service? The team strongly advised that building an effective technology transfer capability cannot be done through a one-or-the-other approach. The real issue is how to build linkages between the research establishment, public extension service, and a wide range of public and private organizations who also are in contact with farmers. The extension function can only be carried out through a well orchestrated technology transfer system. This project component follows that approach.

As a result of the GOE Consultants Working Group and USAID activities, during the last half of 1987 some significant organizational changes were made and an emergence of a new understanding of technology transfer was gained by key GOE decision

makers. Building upon the provisions given in the 1983 Cabinet Decree, an ARC Deputy Director for Extension Affairs (ARC/EAD) was appointed to (1) oversee the extension function within MOA, (2) establish an effective technology transfer system, and (3) serve as the focal point for this project component. A new ARC unit was created and a director appointed. It is the Central Administration for Specialized Extension (CASE) and is to serve as a catalyst for (1) building a cadre of Subject Matter Specialists (SMSs) who are researchers within and outside of ARC, (2) developing technical information packages, and (3) ensuring the 10 proposed Research/Extension Centers at ARC Research Institutes support the governorate technology transfer programs. The Central Administration for Agricultural Extension Services (CAAES) and the ARC Agricultural Extension and Rural Development Research Institute (AERDRI) have been active participants in the deliberations on strengthening the technology transfer system. Other groups have also been active in the discussions related to this project component, including PBDAC (Small Farmer Program), officials involved in the cereals program, World Bank personnel, and CID staff involved in the research component of NARP.

At the time of writing (early 1988), there clearly appears to be a most favorable situation in GOE for moving forward on this project component for strengthening the extension function through an effective technology transfer system. The understanding and acceptance of a comprehensive public and private sector technology transfer system exists among key decision makers and the organizational units required to successfully implement this component are closely working together.

3. The Problem

Even though much has been learned from previous projects, USAID and other donors studies, and GOE experience, there is technology available (in some cases it could double yields) which farmers are not using. At the current time the overa l system for technology transfer is not effectively operating to systematically and continuously monitor farmer needs, draw appropriate technology from a variety of research institutions, and disseminate technical information through a comprehensive network of private and public intermediary groups to farmers.

The current agricultural technology system in Egypt appears to be fragmented with separate vertical links to farmers and few horizontal links which would facilitate a coordinated private sector, mass media, and public extension service approach to serving farmers' needs as is recommended in USAID extension guidance. The system has been predominantly top down with production and economic targets established to meet national goals rather than to serve

farmers socioeconomic needs and wishes. There appears to have been little provision for feedback and participation by farmers in determining research priorities or designing effective technology programs. The GOE Consultants Working Group report, (Appendix 1, Annex 0), released in July, 1987, indicates that senior level government officials recognize these problems and are ready to make the changes that are needed to address them.

The technology transfer system has stagnated and not contributed as much as might have been expected to agricultural productivity growth. Private sector involvement in extension is incidental to their business concerns. Mass Media are used, but not as effectively as more budget and better organization would allow. Extension staff at the governorate level are generally not well trained, there are not close linkages with research, salaries are low and incentives irregular, they do not have the equipment that permits effective communication with farmers, they are immobile from lack of transportation equipment that limits the number of farmers they can contact, and they lack the crucial operating budget that permits organizations to function effectively.

The Extension Design Team, in cooperation with GOE officials and drawing upon previous studies, identified specific needs for improving the technology transfer system:

(1) There was not a focal point for GOE research and extension officials to manage a comprehensive technology transfer system involving networks of public and private organizations which would link research with extension. (With recent organizational changes made the organizational structure is mostly in place, but the capabilities in management, program planning, and system monitoring need to be strengthened.)

(2) The research establishment needs to become more involved in technology transfer, more SMSs employed, mechanisms established to package technology for dissemination to intermediary groups, and broaden the role of field experiment stations to include the extension function.

(3) The public extension service needs to be (a) reoriented to serve as a facilitator for involving other public and private intermediary groups in the technology transfer process and to be given the resources to work with these groups; and (b) strengthened to better design and implement decentralized governorate extension plans and programs for disseminating technology to farmers in coordination with other groups.

(4) The intermediary groups other than the public extension service (such as cooperatives, village banks, PVOs, universities, other ministries, farmers associations, companies,



(183)

schools) are not active participants in the technology transfer system or cooperating closely with the public extension service; and they must be involved and provided technology, skills and resources to help serve the farmer.

(5) The linkage mechanisms in the system are weak, especially between (a) researchers and public extension service; (b) researchers and non-public extension service intermediary groups; (c) public extension service and other intermediary groups serving farmers; (d) public extension service and farmers; and (e) non-public extension service intermediary groups and farmers.

(6) Feedback from farmers to policy makers, program planners in the technology transfer agencies, and researchers is weak and current work in this area is not done on a systematic and continuous manner.

4. Institutional Framework of Technology Transfer System

The most unique aspect of this project is the institutional perspective. ARC is the focal point because it has the GOE mandate within MOA to be responsible for the research and extension functions. However, this project is not limited to ARC or the public extension as similar projects in other countries. This project is concerned with creating a networks of public and private organizations that will most effectively link research with farmers. Therefore, there are many other agencies in MOA and other ministries involved as well as many non-government agencies. Since there is a normal resistance of governmental agencies to cooperate and often even more resistance from the private sector to link with governmental research and extension agencies, a considerable amount of effort in this project component is devoted to encouraging the formation of a technology transfer system where these organizations are working together to better serve the farmer.

Studies by the Agricultural Extension and Rural Development Research Institute (AERDRI), universities and other groups show that Egyptian farmers seek and receive technology through a complex network of individuals and organizations. USAID funded studies have supported the fact that the extension function in Egypt is done through a complex system. Experience through USAID "first generation" projects, such as Small Farmer Production Project, clearly showed that the linking research organizations, public extension and non-public sector agencies (which provide credit, supply inputs and information) increase farm production and incomes.



64

This component of the NARP project is implementing the suggestions made by AID/W Working Group on stimulating private sector extension. The AID/W Working Group's recommendations include "supporting improved host government policies; making extension training more relevant to private sector needs; funding feasibility studies; ... and otherwise encouraging public and private sector cooperation." (page 19, Britan, May 1987)

The Extension Design Team used a comprehensive diagnostic framework and other tested analytical tools to study the Egyptian technology system that currently exists and to identify constraints. This involved doing an inventory of institutions which are involved in technology generation, transfer and related functions such as policy and transfer of supply inputs (including credit and other services). Chart 1 (Organizational Overview of Egyptian Agricultural Technology System) shows the primary groups of government and non-government organizations that are involved in the Egyptian agricultural technology system at the current time. The chart also illustrates the lack of horizontal linkages among many of these groups.

The Design Team then traced through the system several specific technologies to better understand the network of institutions involved and where there were linkage problems. A conceptual model was then constructed showing that the technology transfer process between researchers and farmers is executed primarily through intermediaries. These intermediaries are in the private sector (e.g., processing and input distribution firms, PVOs, and organized farmer groups and their leaders) and in public sector entities including banks, cooperatives, and the MOA extension services. Chart 2 (Egyptian Agricultural Technology Transfer System) shows that technology transfer takes place through two sets of linkages.

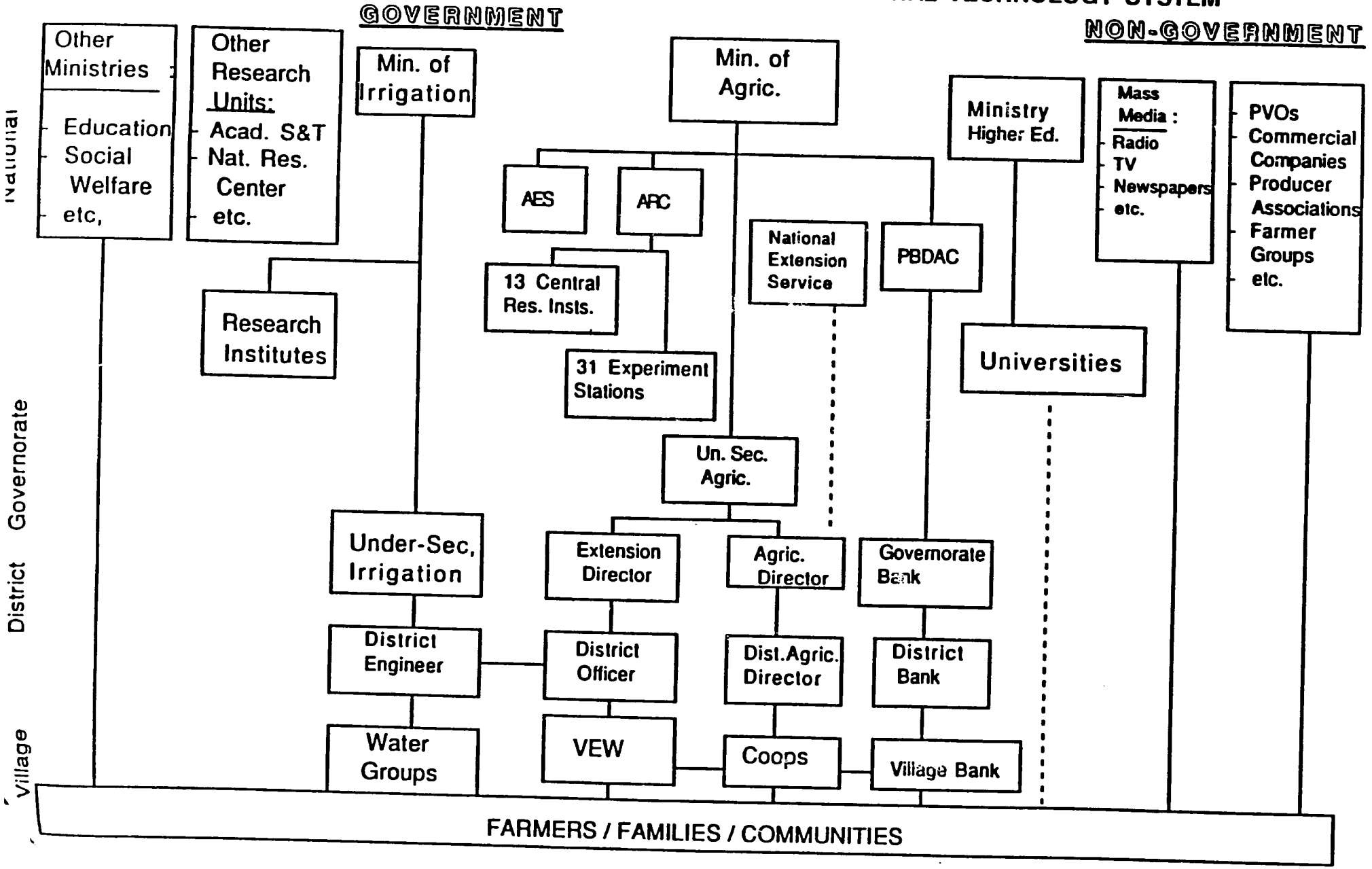
One set of linkages is between intermediaries and the research community. The other set is between the intermediaries and farmers. The research/intermediary linkage involves identification and training of researchers as subject matter specialists (SMSs). The SMSs are recruited primarily from the ARC and the universities. They develop area specific technology packages from research findings to be used in governorate technology transfer programs. The SMSs also provide a technical problem solving (back-stopping) service to the MOA extension service and a wide variety of other private and public sector organizations. Other researcher/intermediary linkages include the involvement of researchers in training programs, seminars, and workshops, all designed to upgrade the staff capabilities of intermediaries.



165

Chart 1

## ORGANIZATIONAL OVERVIEW OF EGYPTIAN AGRICULTURAL TECHNOLOGY SYSTEM



INSERT CHART #1 "ORGANIZATIONAL OVERVIEW OF EGYPTIAN AGRICULTURAL TECHNOLOGY SYSTEM"

The focal point in MOA, and for the NARP project, for the creation of new technology is ARC in terms of personnel, facilities, assigned mandate and the new technology actually created. However, in terms of the research and this component of NARP, many other research organizations are involved. Non-ARC units involved are the 14 agricultural university faculties whose output will be materially strengthened by the grants program under the Research Component. There are also a half dozen or so private firms that are engaged in agricultural research, e.g., the Pioneer Seed Company for hybrid maize, grain sorghum, and sorghum-Sudan grass forage. The Ciba-Geigy firm is engaged in chemical research related to pesticides and herbicides. There are specific private sector research proposals under the NARP research grants program.

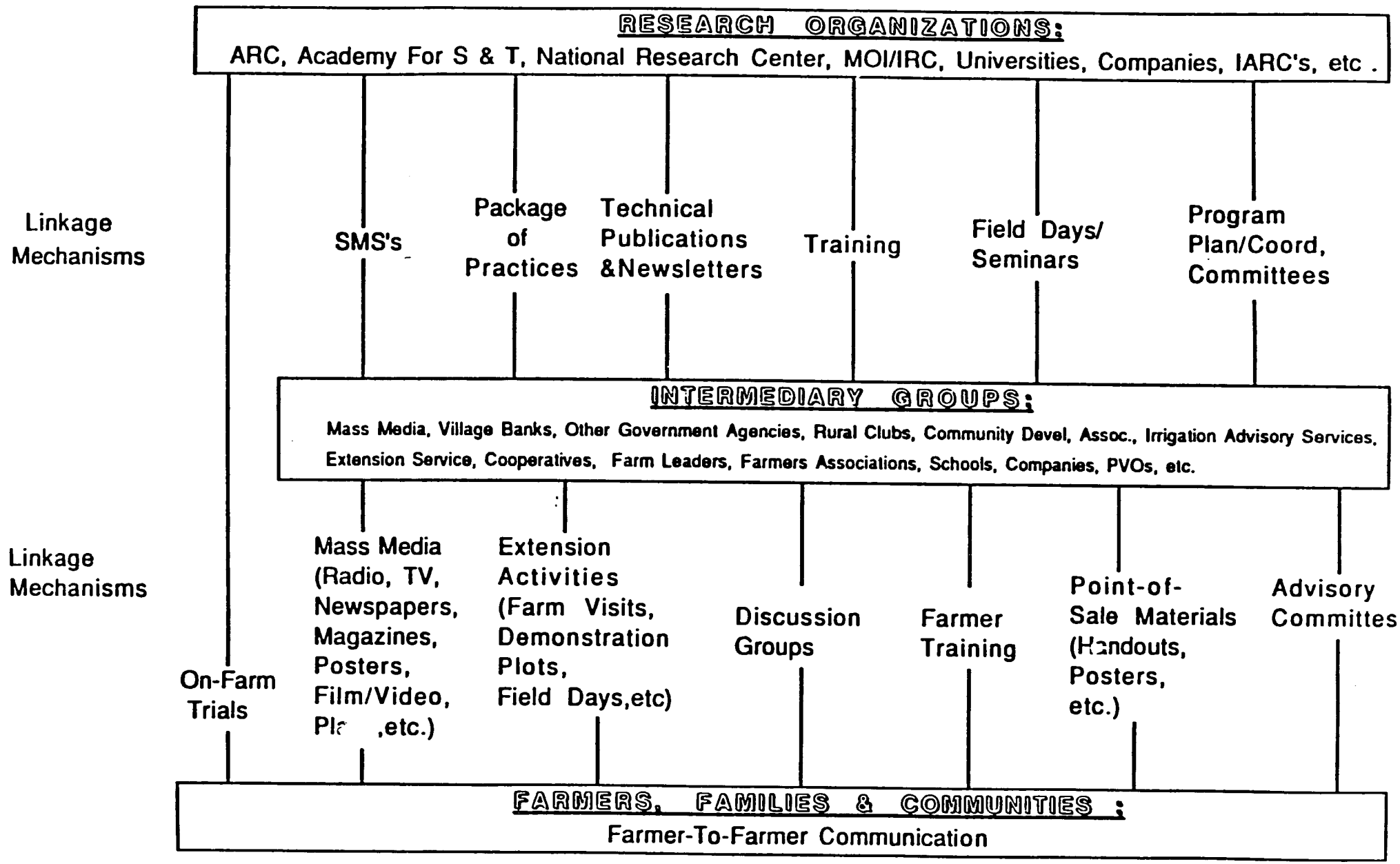
The intermediary/farmer linkages are the primary means of getting productivity increasing information to farmers. Mass media (e.g., radio, T.V., newspapers, and magazines) information is provided to farmers by various intermediary groups. Intermediaries also use demonstrations, farm visits, field days and farmer training. Linkages by private firms include advertising of products and materials distributed at point-of-sale. Farmers are active members of advisory and planning committees initiated, or participated in, by intermediaries or SMSs.

The ARC Extension Affairs Division (ARC/EAD) will be the focal point for carrying out the extension function for GOE and, therefore, for this project component. Working with ARC/EAD are three units involved in this project component that deal specifically with technology transfer — (1) the newly created Central Administration for Specialized Extension (CASE) will manage the SMS input into technology transfer programs; (2) the Central Administration for Agricultural Extension (CAAES) which is commonly referred to as the "National Extension Service" because is the link with the governorate extension services; and (3) the Agricultural Extension and Rural Development Research Institute (AERDRI) which will conduct special studies and be responsible for monitoring component activities.

The technology transfer intermediaries as shown in Chart 1 are categorized government and non-government. (They also are shown as intermediaries in Chart 2.) The non-government group include business firms, PVO's, farmers' associations, etc. Various agriculturally related firms come in contact with farmers through sales of their products — agricultural chemicals, seeds, and machinery and equipment. Other private firms will have direct involvement with farmers through purchase of farm commodities. The policy reform dialogue is expected to substantially expand the magnitude of private firm contacts with farmers. PVO's in direct contact with farmers are focussed primarily on community development-type activities. These usually involve programs for selected villages.

Chart 2

## EGYPTIAN AGRICULTURAL TECHNOLOGY TRANSFER SYSTEM



INSERT CHART 2 "EGYPTIAN AGRICULTURAL TECHNOLOGY TRANSFER SYSTEM"

Government intermediaries include the Public Works and Water Resources (PWWR) Ministry (irrigation) which has staff contact with virtually every farmer in Egypt since most of the land farmed is irrigated. Coordination and integration between MOA and PWWR are essential for optimum utilization of AID/GOE investments in the Irrigation Systems Management (IMS) Project and this Project. There already exists some MOA collaboration with the pilot areas being developed under the IMS project. However, this collaboration is minimal and will be strengthened.

In terms of this project component an important intermediary is the MOA public extension service. It includes seven thousand field staff working at village, district and governorate level. There are nearly 200 central extension staff in Cairo. The public extension service at the central and governorate levels will have two responsibilities through this project component: (1) to be a facilitator enlisting the participation of other intermediary groups in the technology transfer system and providing one link for them to the research community; and (2) to serve as a link between research and farmers.

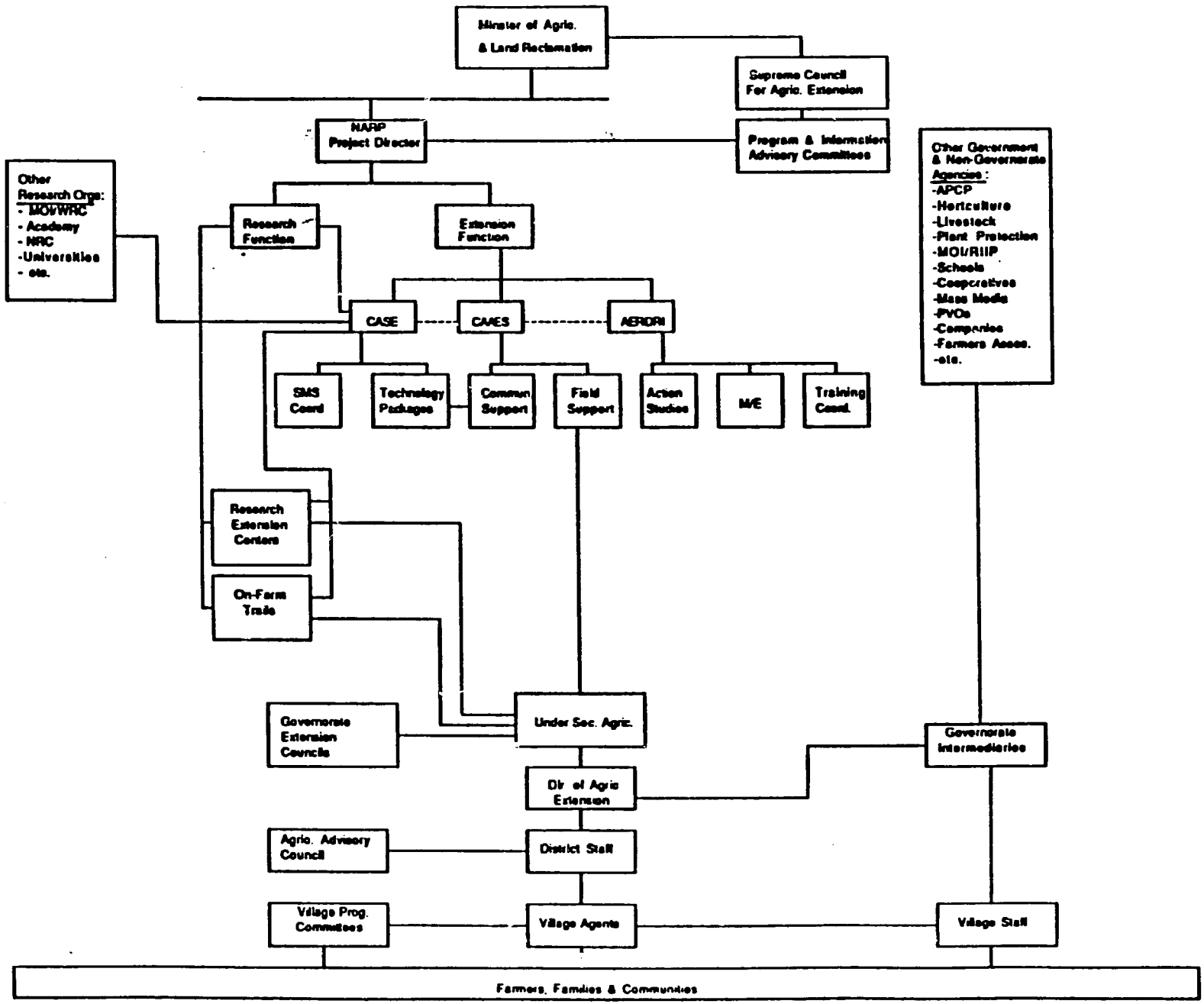
The MOA has other staff who are also in direct contact with farmers. The Horticulture, Veterinary and some other MOA departments have field staffs totaling nearly 35,000 that do extension-type work. The cooperative, statistics, pest control, and other local MOA staff contact farmers as related to their services functions. Currently they are not significant conduits of technical information, but this project component will encourage more efforts in this field by them. The agricultural bank (PBDAC) is, a significant extender of information, along with inputs and credit and is in contact with essentially all farmers.

The on-farm trials of research results conducted by the researchers on farmers fields provides direct feedback from farmers to researchers. Farm demonstrations conducted by extension workers and back-stopped by SMSs give farmers a broader but less direct feedback opportunity to researchers. Another important element of feedback included in this project component is the special studies and monitoring/evaluation activities to be coordinated by AERDRI.

The Extension Design Team eventually, working with GOE, helped prepare a detailed functional chart showing the overall technology transfer system which this project component is to help strengthen. Chart 3 (Functional Chart of Technology Transfer Component) shows all the key groups of public and private organizations to be involved in this project component and how they will be linked.

Chart 3

# FUNCTIONAL CHART OF TECHNOLOGY TRANSFER COMPONENT



INSERT CHART 3 "FUNCTIONAL CHART OF TECHNOLOGY TRANSFER COMPONENT"

B. RATIONAL

Agricultural technology development and transfer does not end with researchers completing their research and publishing a scientific journal article. It is completed when the farmer adopts research results and achieves increases in production and income. Successful technology transfer does not occur through a single linkage. Technology transfer includes three sets of actors: (1) the farmers, (2) the researchers who create the technology, and (3) the intermediaries that link with both the researchers and the farmers. These intermediaries -- cooperatives, village banks, the extension service, mass media, farm leaders and associations, private sector companies, and PVO's -- are the prime movers in technology transfer (see Chart No. 2).

The linkages between these intermediaries and the research community involve such mechanisms as -- packaged recommendations (often referred to as be "package of practices"), publications, SMS's training, personal contacts between researchers and intermediary groups, and field days -- by which the research community interacts with the intermediaries. There are also mechanisms that link the same intermediaries with farmers. Some of these linkage mechanisms are mass media, extension service activities, discussion groups, farmer visits, commercial handouts, and farmer training.

The following are the underlying reasons behind support for technology transfer:

(a) continually increasing agricultural productivity is required to increase production, reduce imports of food, and increase farmer income;

(b) increasing productivity requires a continuous flow of new technology;

(c) technology must be adopted and used by farmers to yield desired benefits;

(d) to adopt and use new technology, farmers need information and problem solving guidance;

(e) when functioning properly, the technology transfer system provides the information and guidance;

(f) the technology transfer system is fragmented and weak;

(g) new technology is being created, and this process will be enhanced, but the results are not getting to farmers in a

timely and efficient manner and, therefore, investments in research are not optimized;

(h) therefore, the technology transfer process must be strengthened.

The process for adoption of new technology is long and complex involving various stages that have been simplified to: (1) awareness of the new technology which is a function of the press, radio, T.V., popular publications (put out by manufacturers or the extension service), and so on; (2) interest in the new technology, when the mass media information is augmented by personal contacts; (3) trial of the new technology either through research/extension sponsored demonstrations or directly by the farmer; and (4) adoption (or rejection) of the new technology. The technology transfer component will deal with all four stages. Sufficient budget is included to involve the mass media to an optimal extent. An extensive on-farm demonstration program in addition to on-farm verification trials by researchers is included. New technology frequently involves different ways of doing things which brings uncertainty into the farming process. The field workers of various intermediary groups, backed by appropriate SMSs, are called on to provide farmers with an iterative problem solving technical service that encourages farmers to effectively adapt the new technology to their particular farming system. This interaction provides the feedback loop that links farmers to researchers through the intermediary field workers and the SMSs. Both will be strengthened under the revised NARP.

C. RELATIONSHIPS OF THE PROJECT

The Project Amendment will build on the experience, organization, and accomplishments of the recently terminated Rice Research and Training (RRT), Agricultural Mechanization Project (AMP), Agricultural Development Systems (ADS), and Major Cereals Improvement (EMCIP) Projects. The thrust of these projects was to strengthen the research and dissemination capabilities of the ARC. Lessons learned from these projects particularly as they apply to technology transfer, are noted below.

Through the "first generation" AID-financed agricultural projects, a variety of extension methods have been tested. Under the Small Farmer Production Project (SFPP), information was delivered to the farmer as part of an in kind credit package. The RRTP and EMCIP were effective in developing for farmer use an appropriate set of technological packages for selected crops; demonstrating to quite a large number of farmers, over a short period, the potential of applying the packages; and in training selected extension workers who were provided with attractive incentives to communicate the packages to farmers. The program did

demonstrate what could be achieved in terms of increased productivity with strong leadership, clear goals, solid technical base, and adequate resources.

The earlier projects demonstrated the need to link research and technology transfer activities, and also helped provide resources (money, materials, transportation, etc.) and recognition to field personnel. Most of the USAID projects focused on individual commodities (e.g., various cereals or horticultural crops) or programs (e.g., credit). They tended to pull the best personnel from the GOE Extension Service. This damaged the institutional capability of the public extension service. Once the projects were completed, the Extension Service was no farther ahead, and many claimed it may have been weakened.

Lessons learned from USAID's world-wide experience with 48 agricultural research projects emphasize that a two-way flow of communication between researchers and intermediary groups and farmers is essential. This feedback loop is provided through on-farm demonstrations and other extension contacts. (See A.I.D. Program Evaluation Report No. 10 and A.I.D. Program Evaluation Discussion Paper No. 13.)

## II. DETAILED DESCRIPTION

### A. OVERVIEW

(1) Objective: The broadest sense, the objective of this project component is to strengthen the technology transfer process between researchers and farmers. More specific, it is to strengthen the capabilities of GOE:

(a) to assess the needs of farmers and based upon those needs;

(b) to utilize a network of public and private organizations involved in research and technology transfer;

(c) to provide appropriate technology to farmers; and

(d) which will result in increased the food production and improved socioeconomic well being of rural communities.

(2) Definition: Improved technology by researchers is shared with farmers via intermediaries. Intermediaries assist farmers in understanding and utilizing the new technology. Farmer problems and needs are shared with researchers via intermediaries.

(3) EOPS:

(a) The central extension planning and management effectively operating in ARC;

(b) A program of innovative grants with a wide range of public and private agencies cooperating to develop new programs;

(c) Practical studies conducted to help policy makers, program planners, researchers and others better understand the technology system;

(d) A training infrastructure able to conduct needs assessments, plan and conduct a wide range of training to make the technology transfer system more effective;

(e) A communication support infrastructure able to produce materials and programs to strengthen linkages between researchers and intermediaries, intermediaries and farmers and directly between researchers and farmers;

(f) Effective technology transfer programs for special groups such as young farmers, women and others;

(g) A cadre of well trained SMSs in ARC, universities, other GOE agencies and non-government organizations;

(h) A continuous flow of packages of practices in the technology transfer system from researchers;

(i) 10 ARC experiment stations converted to be Research/Extension Centers;

(j) Planning and management capabilities of CAAES strengthen to link with the research establishment, support governorate extension services, and enlist the participation of other public and private organizations;

(k) Governorate Extension Councils and GOE governorate staff able to develop effective technology transfer programs involving a wide range of intermediary groups;

(l) A wide range of non-public extension service agencies cooperating with research and the public extension service;

(m) Effective linkages functioning between research and the public extension service;

(n) Effective linkages functioning between research and a wide range of non-extension service agencies in the public and private sectors;

(o) Effective cooperation and flow of technology between the public extension service and the many other public and private sector intermediaries;

(p) Effective linkages between the public extension service and farmers;

(q) Effective linkages between the non-public extension service agencies in the public and private sectors and farmers;

(r) A fully operating Management Information System for the Technology Transfer System (MIS/TTS) and associated activities to ensure a systematic and continuous feedback from farmers to policy makers, program planners, researchers and other groups; and

(s) Farmers who are producing more and enjoying it even more because of their increased incomes.

4. Outputs: The major outputs are:

(a) Strengthened technology transfer system involving a wide variety of public and private agencies working together closely;

(b) Strengthened capabilities of institutions involved in research, public extension services and non-public extension service agencies;

(c) Effective linkage mechanisms between researchers, intermediaries and farmers;

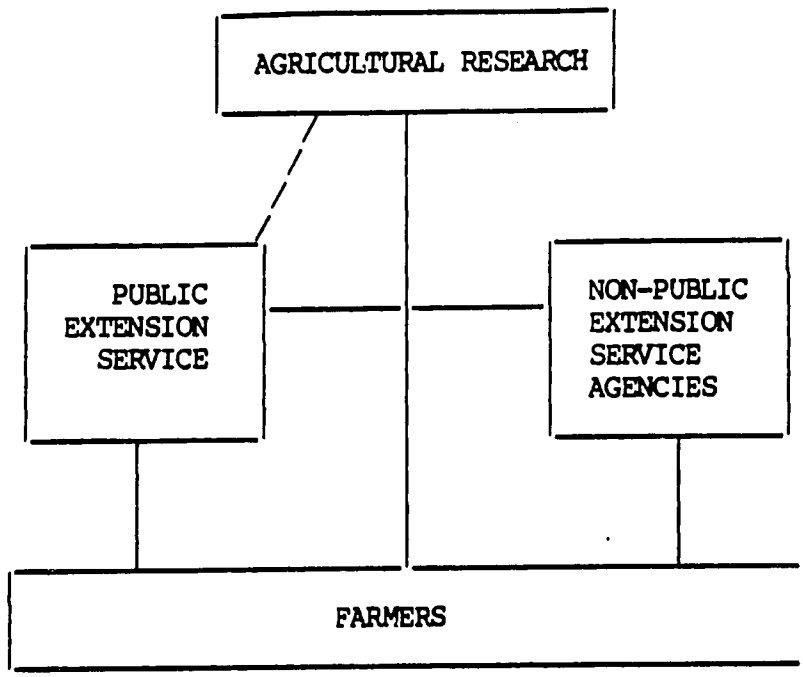
(d) Effective feedback from farmers to intermediaries and researchers.

B. ELEMENTS, ACTIVITIES AND INPUTS

Chart 4 provides an overview of the analysis of the organizations, roles and functions that is shown in Charts 1-3 (in Institutional Framework Section, I.A.4) and serves as a road map for describing the technology transfer system, the primary groups of organizations involved, and what this project component will help strengthen.

Chart 4 ORGANIZATIONAL GUIDE TO PROJECT ACTIVITIES, ELEMENTS AND INPUTS

Technology Transfer System




As the chart illustrates, this project component deals with establishing an effective system that involves groups of organizations to implement linkages to serve the technology needs of farmers. This system is responsible for adapting, packaging and disseminating TECHNICAL INFORMATION--in other words, it is an information system. Even though the research establishment involves a number of research organizations, this project will be focus on only part of the information that flows to farmers. The public and non-public extension organizations will also draw research information from other sources and relay that technology to farmers.

This project will address four specific aspects of strengthening the extension function through this technology transfer system:

(1) strengthening the planning and management capabilities of ARC/EAD;

(2) improving the governorate level public extension capacity;

(3) supporting non-public extension services agencies's efforts; and

(4) strengthening the researcher's technology transfer capabilities.

The purpose of this project component is to draw technology from the research establishment (being supported by the research component) and transfer it through public/private sector networks to farmers. This extension function involves strengthening: (1) the research establishment to adapt, package and help disseminate their technology; (2) the public extension service at central and governorate levels to (a) disseminate technology through other intermediaries, and (b) directly to farmers; (3) a wide range of other intermediaries (universities, other public sector agencies, PVOs, commercial companies, and other groups) whose primary task is not extension, but are in contact with farmers and, therefore, can disseminate information along with their other goods and services functions; and (4) the linkages between and among these groups. The following narrative describes how this project component will help strengthen technology transfer in Egypt by listing the specific elements, activities and inputs.

STRENGTHENING THE PLANNING AND MANAGEMENT CAPABILITY OF ARC/EAD

The following project activities will provide support for building and integrating the overall technology transfer system. Several activities focus on expanding and managing the system while others strengthen support programs which will serve the whole system.

Program Planning and Management

The ARC Deputy Director for Extension Affairs ARC/EAD, under the guidance of the Supreme Council for Agricultural Extension, will be the focus for technology transfer activities funded through this project. The ARC/EAD will plan and manage the overall national technology transfer program which involves research, public extension service and non-public extension agencies. This will include determining priority programs to be developed and overseeing their implementation. At the central level, there are three units directly involved in supporting the technology transfer system. The newly created Central Administration for Specialized Extension (CASE) works with the research establishment strengthening capabilities of researchers and their institutions to link into the technology transfer system. The Agricultural Extension and Rural Development Research Institute (AERDRI) is responsible for social science research and feedback from farmers to policy makers, program planners and researchers. The Central Administration for Agricultural Extension Services (CAAES), which is often referred to

as being the "National Extension Service," is responsible for the link between the central and governorate level extension programs. CAAES serves as the organizational focal point for technology transfer activities within the public extension service and from it to other intermediaries offering services to farmers. The objective of these activities are to strengthen the capabilities of the NARP Project Director, ARC/EAD and its associated agencies (CASE, CAAES, and AERDRI) to:

(a) conceptualize the system and orientate others;

(b) manage the technology system;

(c) design effective technology transfer programs;

(d) facilitate the development of effective linkages among the networks of public and private sector organizations involved in the technology transfer; and

(e) to monitor the system and programs, and introduce changes as needed.

Major activities to be conducted here are preparation and review of annual work plans and budgets, assist the Project Director in day-to-day management responsibilities, and provide overall project management and monitoring.

Specific activities to achieve these capabilities include:

(a) provide TA to assist in monitoring and reviewing governorates, non-public organizations, ad R/E centers as appropriate;

(b) provide short-term TA to establish monitoring and accounting systems for budgets, inventory, training and personnel development programs;

(c) review all ongoing programs to ensure inclusion of the maximum number of research, public extension, and new public extension linkages;

(d) training high and mid-level employees in management and computer techniques;

(e) long-term offshore training; and

(f) vehicles and office equipment to facilitate coordination.

Major inputs involve 72 person months (p.m.) long-term and 17 p.m. short-term technical assistance (TA) focusing on organization and management, assist establishing operating systems and strengthening planning. Training will overseas study tours for 45 person-months.

Action-Oriented Studies for Strengthening Technology Transfer

AERDRI will be the focal point for conducting studies that will contribute to better standing of the overall Egyptian agricultural technology system and needs of farmers. These action-oriented practical studies are to assist GOE policy makers, donors, program planners and managers, and others concerned with technology transfer to determine where interventions should be made for strengthening the system. Illustrative studies are described in Appendix 4. The exact focus of the studies will be agreed upon in the implementation plan for the project and be reviewed every six months by the Project Manager, EAD, AERDRI, the TA team, and USAID. Subjects of studies include technology needs assessment of farmers, information seeking patterns of farmers, analytical mapping of the technology transfer system, evaluation of current linkage mechanisms, etc. The objective of this element is to:

(a) strengthen AERDRI capabilities to identify, design, conduct, report and disseminate the findings of these studies through increasing staff skills, data collection and processing equipment, improved mobility, and office support; and, (word processing equipment, files, duplication equipment, etc.);

(b) provide funds for AERDRI to involve other groups including universities, social science research organizations, communications and market research groups, private sector organizations and others.

Specific activities to help AERDRI achieve these capabilities include:

(a) performing and/or contracting for these studies;

(b) making program recommendations based on research results;

(c) short and long-term academic, technical, and hands-on training and;

(d) short-term TA to assist in such areas as research design, sampling techniques, and data analysis.

The inputs will include 18 p.m. short-term TA, $135,000 for computers vehicles and other office equipment, training in U.S. of 15 staff in various subjects will receive short term training and 4 staff will receive long term training, $300,000 worth of in-country training for staff, $ 300,000 for contracting with other groups. The estimated total is $1,366,000; $657,000 of this is in local currency.

Strengthening Training Infrastructure

AERDRI will serve as the focal point for training and will be responsible for conducting, or contracting with others, training needs assessments of all the key groups in the technology transfer system, maintaining a master training plan, ensuring training institutions are capable to conduct the required training in terms of pedagogy and subject matter, and to evaluate the training done. The actual training will be done by other institutions (MOI training institutes, universities, etc.) and funds through this element will be provided to them (except for the 10 research/extension centers) to improve their training capabilities. This element will not provide funds for actual training (teacher costs, teaching materials, participant travel and per diem,) which is handled in the other elements. The funds for strengthening specific training institutions will be reviewed during the annual project reviews. The objective of this element is to:

(a) strengthen AERDRI capability in terms staff skills in training planning and management, electronic data base resources for monitoring training needs of people involved in technology transfer programs, audiovisual facilities (for reviewing materials produced), mobility, and office support; and

(b) strengthen capabilities of involved training institutions for improving staff skills as trainers, teaching equipment and materials, training facilities, and support services (duplication, facilities for trainees).

Specific activities to help AERDRI achieve these capabilities include:

(a) providing short-term TA for curriculum design, manpower development and technical subjects as appropriate;

(b) developing course curriculums for these courses most frequently taught;

(c) providing short and long-term training for institute staff;

(d) providing audiovisual equipment and computers to assist in monitoring functions;

(e) modest remodeling of facilities; and

(f) providing vehicles to increase mobility.

Inputs will include 22 p.m. short-term TA focusing on training planning, training trainers, teaching materials production, training facilities, and training evaluation. 3 AERDRI staff will be sent for U.S. degrees in training methodology and adult education and 32 person months for short-term training. AERDRI will be provided $28,000 worth of training support equipment and materials. The overall estimated cost is $704,000; $23,000 of this in local currency. (The other activities will include funds for the actual training costs.)

Strengthening Communication Support Infrastructure

CAAES has the central communication unit which will support the system. However, smaller communications support units will also be established in the research/extension centers and possibly in some of the governorates. The objective of this element is to strengthen the CAAES communication support unit to:

(a) do systematic communication planning for supporting technology transfer programs working with researchers, intermediary groups program planners, AERDRI researchers, trainers at training institutes, and others required for designing effective communication strategies and programs;

(b) design communications materials and programs that will facilitate links between researchers and intermediary groups (i.e. package of practices, technical publications), support training (i.e. training manuals, audiovisuals), enhance extension methods by intermediary groups field personnel to work with farmers (i.e. flip charts, handouts) and communicating directly to farmers through mass media (i.e. radio, posters);

(c) pretest communications materials and redesign to ensure they are program and cost effective for intended audiences;

(d) produce suitable communication materials and programs in sufficient quality and quantity in a timely manner; and

(e) disseminate to intended audiences through mass media and intermediary groups;

Specific activities to help CAAES communication support unit to strengthen these capabilities include:

(a) providing short-term TA for communication planning, social marketing research and evaluation;

(b) providing commodities to assist in materials production and dissemination; and

(c) long and short-term training in mass media, communications, media strategy.

The project inputs will include 21 p.m. short-term TA in the fields of communication planning, social marketing research and evaluation, materials production, and dissemination. 7 staff will be sent to the U.S. for long term training. U.S. short term training of 60 person months will be conducted. $272,000 will be used for communication production equipment and materials, vehicles, and office support equipment.

The overall estimated cost for this element is $1,247,000; $119,000 of this in local currency.

Decentralized Public Extension Service Improvement

Within the technology transfer system, as envisioned in this project, the public extension service at the central and governorate levels will be responsible for (1) linking with and disseminating technology to other public and private sector groups who are in contact with farmers; and (2) at the village level to disseminate technology and provide other educational services directly to farmers. To strengthen these functions of the public extension service, two elements are included in the project:

At the central level, the Central Administration for Agricultural Extension Service (CAAES), which is a small unit, will receive assistance to strengthen its abilities to support the governorate extension program planning and management, to link with non-public extension agencies, and to help the governorate/village level extension services to be able to communicate more effectively directly with farmers. Part is this strengthening will involve a reorientation of the public extension service to serve as a catalyst for disseminating technology through other intermediaries.

A second aspect of this element is strengthening the governorate extension services, which contain the majority of the extension staff. Most of the funds for the governorates will be through the Governorate Proposals which are to be based on comprehensive

technology transfer plans. However, this element provides general strengthening in the areas of orientation of the governorate level staff to the extension system and defining their expanded roles, planning and management, program planning, evaluation and costs for the Governorate Extension Councils.

The objective of this element is to:

(a) increase the understanding of CAAES and governorate extension personnel on the overall technology system, their role in serving other intermediaries and farmers, extension strategies and methods, and program planning;

(b) strengthen links between CAAES and governorate programs and CAAES's capabilities to support the development and implementation of governorate programs; and

(c) strengthen the office operations and management of CAAES and governorate extension units.

Specific activities to help CAAES and governorate extension units to achieve these capabilities include:

(a) short-term TA in extension management, concepts/methods, planning, etc.;

(b) in country training in the areas described above;

(c) office equipment provided and training in its use and maintenance; and

(d) transportation provided to increase mobility.

Inputs for the CAAES will include 9 p.m. short-term TA in the areas of extension concepts/methods and managing support services. $100,000 is for office equipment (computers, duplicators, etc.), audiovisual equipment and materials, communication equipment, and vehicles. Inputs include 8,100 staff receiving in-country training in management and planning.

The overall estimated cost for this element is $3,177,000; $2,986,000 of this in local currency.

Governorate Plans and Proposals

There are 20 governorates considered primarily agricultural. Their agriculture differs significantly from the Delta to upper Egypt. Different cropping patterns and farming techniques in these regions create a requirement for very different kinds of technical

information. That is the reason for focussing on the governorate level for technology transfer planning. There is an agricultural support structure in each governorate which is headed by an Under-Secretary for Agriculture and an Under-Secretary for Irrigation. These two senior officials are responsible for assistance programs for farmers. The Under-Secretariat for Agriculture has a governorate Director of Agricultural Extension and an Extension Director in each District with a sub-structure involving supervisory and technical staff and village extension workers.

This structure, which CAAES oversees and supports, has 7,000 extension workers in the governorates which are supported by approximately 200 personnel at the central level in Cairo. A typical agricultural governorate extension staff totals about 450 (See the Administrative Analysis). The governorate level includes a director and 50 supervisory, technical, and support staff. The district supervisory, technical and support staff average about 140 persons. There are 260 village extension workers. The governorate Under-Secretary is also responsible for the non-extension service personnel such as agricultural cooperatives, the statistics collection staff, and other Ministry of Agriculture field staff assigned to the governorate.

Technology transfer activities in the governorates are under the guidance of the Governorate Councils for Agricultural Extension. The composition of this Council is similar to the Supreme Council for Agricultural Extension in Cairo. It includes various parts of the MOA establishment, irrigation, public works, mass media representatives, agricultural processing and other private firms, and farmers. The Governorate Council is chaired by the Under-Secretary. Staff work is done by the governorate Director of Agricultural Extension.

In a phased effort, six governorates will be selected the first year. They will under the guidance of their Governorate Extension Councils, prepare extension strategies following the systems approach of this project component and develop specific program plans which will include priority subjects, roles of various participating groups, sources of information, timetables, and target results. These plans will serve as the base for the governorates to prepare proposals for assistance from this project which will fit agreed upon guidelines (see Appendix 3, Annex O for guidelines) and approved by Governorate Councils. The propoknzk ba l be submitted to the Supreme Council for Agricultural Extension for review and, if approved, turned over to ARC for review and USAID for funding. The proposals can contain requests for:

(a) TA in technical subjects and extension methods;

(b) equipment such as audiovisual aids, transportation, etc.; and

(c) costs involved in establishing technology transfer programs such as demonstration plots, farm visits, producing communication materials, etc. (Funding recurrent costs will be considered only if it is shown they will be reduced each year and the governorate budget will take over).

Priority will be given to requests that demonstrate involvement in non-extension service agencies, links into R/E Centers and effective farmer feedback mechanisms. Appendix 3 Annex 0 provides details.

Seventy two p.m. of long term T.A. is planned for this activity. Training includes 200 staff receiving observation tours in the U.S. and 8,110 staff receiving in-country training. $7.9 million is anticipated for office equipment and supplies, vehicles, and media production and equipment. $3.6 million is planned for on-farm demonstrations and $70,000 is planned for office renovations. $5.4 million is anticipated for the preparation of technical packages. The estimated total for this activity is $23,869,000; $16,691,000 of this in local currency.

Support for Non-public Extension Service Agencies

Innovative Program Grants - A total of $ 250,000 and $750,000 in local currency is earmarked for public and private sector research organizations and technology transfer intermediary groups to do special activities that will:

(a) contribute to a better understanding of the technology system; and

(b) develop and test new types of technology packages prototype communication materials, new extension methods, and training programs;

The objective of these component financed grants is to stimulate a variety of Egyptian organizations (governments, universities, private sector, etc.) to become involved in developing and testing innovative approaches to technology transfer.

Criteria for selecting proposals for funding will be finalized by GOE and USAID during the preparation of the implementation plan (guidelines are in Appendix 2). Priority will be given to proposals (a) developed jointly by two or more MOA and non-MOA public and private sector groups; and (b) showing how the results benefit

multiple organizations in the system to work together for better serving farmers. Costs financed through these grants can be for staff time, nonexpendable equipment which directly relates to the element, expendable supplies, minor facility improvements, transportation equipment, training, TA and travel.

Support to Programs Serving Special Groups

This activity will support special programs for young farmers, women, special commodity groups. Proposals will be developed based guidelines found in Appendix 2. The purpose of this activity is to support programs aimed at a specific, hard to reach segments of the agricultural community. $500,000 and $1,500,000 in local currency will be earmarked for these activities.

Strengthening the Non-Public Extension Service

A wide variety of intermediary groups outside the public extension service will be involved in this project component. These include mass media organizations, cooperatives, village banks, farmers associations, schools, companies, PVOs and others. These groups will be represented on the central level Supreme Council for Agricultural Extension and the Governorate Extension Councils and, therefore, will be involved in planning technology transfer programs and have access to technology coming directly from research institutions or through the public extension service. They will be included in training programs, receive technical literature and other reports, and be included in other appropriate activities.

In addition to the Extension Service, there are a number of GOE agencies represented at the local level. These include PBDAC's 20,000 field staff, PWWR's 12,000 field staff, 1,000 field staff for veterinary services, 800 integrated pest management field staff, 1,000 horticulture staff and 40 aquaculture extension staff. Some of these field staff are currently performing extension services, and all are in contact with farmers.

Producer syndicates, credit institutes other than PBDAC, and community groups with target audiences, e.g. youth and women and also involved with technology transfer activities at the local level.

Coordination and integration between the Ministries of Agriculture and Public Works and Water Resources (PWWR) are essential for optimum utilization of AID/GOE investments in irrigation infrastructure and maximum returns from the new technology to be created and delivered under this project component. There is clear recognition in the field of the necessity for irrigation and agriculture to the collaborating closely to achieve

improved water management. Efforts are underway to facilitate this collaboration include MOA representation on the National Coordinating Committee for the Irrigation Management Systems Project. The Supreme Council for Agricultural Extension which will include PWWR representation. Parallel councils at governorate level will each include irrigation representation. At the field level there already exists some MOA collaboration with the RIIP pilot areas being developed under the IMS project. PWWR has contracted with ARC to do socioeconomic baseline surveys for a number of regional irrigation improvement areas and for research data on water use and on soil structures and soil mapping. This kind of collaboration needs to be expanded rapidly and requires a more formal understanding between PWWR and MOA. The PWWR has under consideration the establishment of an Irrigation Advisory Service (IAS) that would assist farmers. The two ministries need to formalize arrangements about an IAS. A water management program should be included in each governorate technology transfer program with provisions of MOI, MOA and other public and private sector intermediaries involved.

Two elements will directly support these non-public extension service agencies:

Strengthening Institutional Capabilities

Funds will be used directly to strengthen the capabilities of these groups and additional funds will be made available through the Innovative Program Grants and Special Grants for Increasing Participation of Non-Public Extension Agencies. The objective of the direct support to these organizations is to strengthen their capabilities to:

(a) understanding of the overall technology transfer system, their roles, extension concepts and methods, and program planning;

(b) participate in planning and implementation of technology transfer programs at the central, governorate and village levels;

(c) access technology from the research establishment and adapt/integrate it into their programs, and disseminate it to farmers; and

(d) assess farmers needs and feed this information back through the system to governorate and central planning councils, policy makers and researchers.

Specific activities to help these non-public extension service agencies achieve these capabilities include:

(a) short-term training in program planning, extension strategies and methods, program management, and evaluation;

(b) providing audio/visual for orientation and training; and

(c) in-country travel allowance to facilitate incorporation of farmer feed back.

The input for this will include ten p.m. short-term TA for expertise from cooperatives, private sector and farmers' associations to help design the orientation and training (with other TA already available through other activities).

$500,000 and $1,500,000 in local currency is set aside for grants. The overall estimated cost for this element is $ 650,000 and $1,500,000 in local currency.

Special Grants for Increasing Participation of Non-Public Extension Agencies in Technology Transfer

Non-public extension service agencies will be encouraged to prepare proposals for direct submission to ARC for review with USAID. These proposals could be for funds to:

(a) build up their capability in training, communication support, management, preparing technology packages, program monitoring, etc.; and

(b) to design and test experimental programs (this element is the same as in the linkage element #9 below).

The criteria for these grants will be agreed upon by GOE and USAID (see Appendix 2). The overall purpose is to stimulate greater participation by the non-extension service organizations in technology transfer program and stimulating closer cooperation with the research establishment and public extension service. Priority will be given to proposals showing close links with research and public extension service (but not necessarily part of the same program). A total of $3,000,000 and $9,000,000 in local currency is earmarked for these grants. 72 p.m. of long term T.A. is envisioned. $500,000 for promotion and processing of the grants.

Public Extension Service and Non-Public Extension Agencies Links

A key element in the involvement of a wide variety of public and private intermediaries in the technology transfer system, especially at the governorate level, will rely on the ability of the public extension service to forge links with these organizations and

to have the competence to disseminate technology to these groups. Funds for institutional costs are provided elsewhere (institutional strengthening of public extension service and non-public extension agencies). Funds in this element will be only for the costs of the actual linkage mechanisms. Therefore, the objective of this element is to provide funds to increase the linkages between research and the non-public extension service agencies through the support of:

(a) coordinating councils/committees (at central, governorate and village levels);

(b) technical information packages;

(c) special field days/demonstration plots;

(d) personal contacts; and

(e) other communication links.

These links will enhanced through the innovative program grants, the special grants for non-public extension agencies, and the governorate proposal.

Specific activities to achieve strengthening these linkages include:

(a) establishment of an effective coordinating committee at central, governorate and village levels;

(b) disseminating technical packages; and

(c) organizing special field days for demonstration plots.

The inputs will include $ 10 p.m. for CAAES to use coordinating the councils, and developing technical packages.

The overall estimated cost for this element is $150,000.

Strengthening the Research Community Technology Transfer Capability

Strengthening Research Institutions Capabilities in Technology Transfer - The research component of NARP will focus on the development of new technology (up to the stage of a scientific journal article for other researchers). This component of the NARP project will link with the research establishment at that point and focus on the adaptation, packaging and dissemination of the information to intermediaries--in other words, working with researchers on strengthening the research-extension linkage. While

ARC CASE will be responsible for linking with a number of research programs in other government agencies and, where possible, with private sector groups. An important group outside ARC are the researchers from the 14 Faculties of Agriculture in the Universities will become involved in the technology transfer process as both subject matter specialists and packages of new technology for farmers.

Strengthening SMS Capabilities

CASE will be the focal point for this element and will serve as a catalyst for enlisting researchers at ARC, universities, other GOE units, and non-government organizations to be Subject Matter Specialists (SMSs). For the most part, SMSs will be researchers who also have technology transfer responsibilities.

The objective of this element is to help CASE to:

(a) maintain a roster of researchers and specialists in a wide range of fields--including their skills, location, and interests--which can be used as SMSs; and

(b) working with AERDRI, ensure SMSs are provided orientation in the technology transfer system, training in extension and communications methods, and technical training where needed.

Specific activities to strengthen CASE in these capabilities include:

(a) short-term TA will assist CASE in both technical subjects and planning and management;

(b) office equipment to assist more efficient management and greater amounts of training;

(c) international seminars and workshops to allow researchers access to a broader range of new technologies; and

(d) vehicles for greater mobility.

Inputs will include ten p.m. TA in the fields of extension concepts and methods, technical subjects to be reviewed (annually), and program planning/management. 3000 staff will be trained in country. $783,000 is for computers (data base and office operations), communication/audio visual, and other support equipment and materials.

The overall estimated cost for this element is $5,133,000; $4,413,000 of this in local currency.

COPYEXTN. Doc 2/25/88

Preparing Packages of Recommended Practices

CASE will provide the leadership--with full involvement of the CAAES communication support unit, AERDRI, and governorate extension units--to work with SMSs in a wide range of institutions (ARC institutes and experiment stations, universities, other public sector research institutions, PVOs, companies and others) to prepare packages of practices which can be used as reference materials and for training field personnel in intermediary groups. The objective of this element is strengthen CASE to:

(a) organize technical advisory groups to determine subjects and producing the packages of practices, including drawing upon the MIS/TTS and other feedback mechanisms;

(b) oversee the production of the packages of practices;

(c) ensure the packages are disseminated to wide range of intermediaries directly or through training, field days, etc.; and

(d) link with on-farm trials and other programs who are involved in adaptation of technology and working with farmers.

Specific activities to help CASE achieve these capabilities include:

(a) short-term TA will be provided to assist in the design and production of packages;

(b) funds are available for local contracting for the production of these packages; and

(c) in-country training will be provided for researchers, SMSs, and extension (both public and non-public) personnel.

The inputs will involve 8 p.m. short-term TA in the overall system of packages of practices, production and distribution. It is envisioned that 200 packages will be produced at a cost of $500,000 in local currency.

The overall estimated cost for this element is $ 120,000 and LE 500,000.

Creating Research/Extension Centers

Through the life of the project (LOP) 10 ARC experiment stations will be converted to become Research/Extension Centers, each serving two adjacent governorates in developing and refining recommendations to meet specific needs of the locale. Coordination

with ongoing on-farm research will be a responsibility of each center. By adding the extension function, researchers at the stations will become much more involved as SMSs and the ARC research activities will be more closely linked with the public extension service and non-public extension service agencies. The R/E Centers will be involved in helping governorates design and implement their technology transfer programs. They will also serve as a vital feedback mechanism of farmers needs which will be essential for design of adaptive and zonal research programs of the experiment stations.

The R/E centers will work with the governorates in incorporating SMS related activities into the governorate technology transfer plans. The final plans will take local conditions (both agronomic and cultural) into account and will be coordinated with other agencies represented in the respective governorates. Four centers have been selected for the first year. They are located at Sakha (serving Kafr El Sheikh and Dakahlia governorates, Gemeiza (serving Gharbia and Menoufia), Sids (providing support to Beni Suef and Fayoum), and Shandawheel (responsible for Sohag and Assiut). Additional centers (for a total LOP level of ten will be added incrementally).

The objective of this element his to create or strengthen the capabilities of 10 ARC experiment stations to:

(a) provide the leadership for research-extension coordination, for the experiment station and linkages with the technology transfer programs of the two governorates be served and intermediary groups involved in these programs;

(b) provide leadership for organizing training carried out by the experiment station staff (at the R/E Center and other locations), preparation of training materials, training trainers, and ensuring availability of proper training facilities; and

(c) operate a small communication support program producing simple publications and audiovisuals to be used in the R/E Center training and for dissemination to other groups.

Specific activities to help ARC experiment stations achieve these capabilities include:

(a) in-country training will be provided in such areas as coordination, planning and management;

(b) office and training equipment, training materials and vehicles will be provided to assist SMS serve the various intermediary groups;

COPYEXTN. Doc 2/25/88

(c) reproduction and audio visual equipment will be made available to assist the communication unit; and

(d) refurbishing to bring classrooms and training facilities up to standard.

The resources needed for converting the experiment stations to R/E Centers greatly vary and, therefore, the inputs will not be the same for each. The following is a summary of the overall inputs for this activity. 8 p.m. short-term TA in extension management and planning, communication, training and evaluation. 40 staff will be given U.S. short term training, 240 staff will be trained in-country in subjects related to program management, training, and communications. $29,000 is for vehicles, $170,000 is earmarked for remodelling to provide the training and communication support facilities. $363,000, and $752,000 in local currency is the estimated total cost for this activity.

Research and Public Extension Service Links

SMSs, especially those involved in the R/E Centers, will provide the leadership in facilitating this linkage. Funds for institutional costs are provided through institutional strengthening of research and public extension service.

Inputs include $20,000 in local currency for office equipment and supplies.

Research and Non-Public Extension Links

SMSs will provide the leadership in facilitating this linkage. The same types of mechanisms will be supported by this project element. It is expected that this support will have a multiplier effect for these non-public extension agencies in their linkages with other groups (such as companies with their international counterparts, universities with international agricultural research centers, PVOs with universities). Funds for institutional costs are provided through other elements (institutional strengthening of research and non-public extension agencies). The objective of this element is to provide funds to increase the linkages between research and the non-public extension service agencies. $20,000 in local currency is set aside for this.

Strengthening Feedback From Farmers

If the technology transfer system is to function effectively there must be mechanisms to systematically and continuously assess farmers' needs, to monitor the performance of the system in delivering technical information, and to identify outside factors (such as pricing, supply inputs not available) which affect farmers

adopting new technology. The AERDRI will provide the leadership in developing monitoring mechanisms (management information system and other information gathering tools), analyze the information, and ensure it is disseminated in a usable form to policy makers, program planners and managers, and researchers. This program will be the formal feedback mechanism for capturing on a regular and timely basis information coming back through the public and private extension and research networks, and supplementing this with direct surveys with farmers. The objective of this element will support the strengthening of AERDRI to:

(a) complete the design of a Management Information System for the Technology Transfer System (MIS/TTS) (work has already started by AERDRI and universities);

(b) develop the data collection and processing capability for the MIS/TTS;

(c) publish and disseminate a wide variety of reports to various management groups, program planners, etc.;

(d) design and conduct special surveys to supplement the MIS/TTS; and

(e) conduct periodic management review seminars to discuss findings coming from the MIS/TTS and other feedback tools.

Specific activities to help AERDRI achieve these capabilities include:

(a) collecting relevant data on a routine basis to keep the MIS/TTS updated;

(b) in country training in survey research methodology and data processing;

(c) equip the AERDRI to perform this support function; and

(d) scheduling seminars and producing publications on a regular basis of the agricultural community.

The inputs necessary to carry-out the activities include 8 p.m. short-term TA to help design the MIS/TTS, train staff and help operationalize the data collection and processing. $28,000 is for office equipment and media production equipment. A total of $125,000 and $23,000 in local currency is earmarked for this activity.

C. OVERVIEW OF COMPONENT INPUTS

This component will be implemented by the ARC Extension Affairs Division (ARC/EAD). A prime contractor will be responsible

for assisting the ARC/EAD in implementation. The following provides a summary of the inputs provided by this project component, summarized from the above explanation by element.

1. Technical Assistance

The technical assistance (TA) will consist of a total of 18 long-term person years and 141 person months of short-term assistance over six years of the project. The total cost is estimated to be $ 5,139.000 and $648,000 in local currency. Details are in the Financial Plan.

(a) Long Term TA

The long term TA team will be composed of three persons. A Chief of Party/Extension Administrator will work closely with the ARC Extension Affairs Director and the Supreme Council for Agricultural Extension. The Chief of Party will be responsible for assisting the NARP Project Director and ARC/EAD Director in the overall implementation and administration of the component. He will be assisted by two extension specialists assigned to the field. Their primary responsibility will be to assist in implementation of governorate technology transfer programs and administration of non-public technology transfer grants.

(b) Short-term TA

Projected short-term technical assistance requirements consists of two main types: first, technical consultancies (e.g., information and production activities, extension design, or other programs); and second, developing and/or conducting training programs.

Specific areas in which short term technical assistance will be required include agricultural economics, farm management, program analysis, rural sociology, farming systems, agricultural and extension education, agricultural communications, library sciences, computer programming and software, curriculum development and training methodology, equipment repairs and maintenance, financial management, cooperative organizations, women's development programs, rural youth organizations, special studies program design and methodology.

(c) Specialized TA

Soon after authorization, an 8-A firm or other contractor will be required to prepare RFTP's, help select academic trainees, and assist in preparation of the guidelines for the decentralized technology transfer program planning and non-public extension grant requirements. A generic PASA will be used throughout the LOP to provide assistance unavailable through other mechanisms.

2. Training

Training will be provided to increase the efficiency of technology transfer services. Training will be provided at all levels and will include managers, researchers, technicians, clerks, skilled laborers, extension agents, and farmers. Training will concentrate on technology transfer management techniques and methods; information systems management; data collection/analyses and monitoring procedures; and mass media techniques. The bulk of the training will be short term pre-service or in-service concentrating on the substance of technical packages, other extension techniques, and methods of educating farmers. Conferences, tours, and seminars will permit program leaders to learn about new technology transfer and management concepts. Farmers will be the focus of field level training. The total cost is estimated at $3,836,000 and $11,568,000 in local currency.

3. Commodities

An extensive array of commodities will be provided to the governorates and to the three central support units. The commodities are intended to relieve critical bottlenecks in current extension operations - audio visual and other communications equipment, motorcycles and vans, office equipment, and technical support equipment and supplies. The total cost of commodities is estimated at $5,059,000 and $4,283,000 in local currency.

4. Office Renovation

The extension staff is officed with the coop, statistics and other staff of MOA. These facilities are overcrowded, in extreme stages of disrepair, and generally unsuitable as work place for the workers involved and for the general public. It is not intended to try to renovate all MOA facilities in the governorates. However, funds will be made available to each governorate to upgrade the office facilities used by extension and other MOA personnel. The total cost is estimated at $240,000 in local currency.

5. Grants

The following grants will be made available to non-public extension service organizations for technology transfer activities:

- $5 million for grants to PVO organizations;

- $2 million for the commercial private sector activities;

- $3 million for educational institution proposals;

- $2 million to fund proposals to assist youth, women, and self-help groups;

- $2 million to finance proposals for mass media activities;

- $2 million to fund discrete activities of both MALR and non-MALR agencies; and

- $1 million is earmarked for innovative program grants.

## III. IMPLEMENTATION PLAN AND SCHEDULE

### A. PROJECT MANAGEMENT

#### 1. GOE/USAID Project Management

All technology transfer activities under this project component receive guidance from the Supreme Council for Agriculture Extension which is under the chairmanship of the Minister of Agriculture and Land Reclamation. The Council has representatives from the Ministry of Agriculture and affiliated authorities such as PBDAC, scientific authorities outside the MOA, the Ministry of Public Works and Water Resources (irrigation), mass media representatives, farmers' groups, and private sector representatives. The Council will provide overall direction to the component. The ARC Director, as overall NARP Project Manager, will oversee this component with the Deputy Director for Extension Affairs serving as component day-to-day manager, and who also will form advisory committees as appropriate.

The GOE management structure for the three components of NARP will provide maximum operating autonomy to the component managers under the overall direction of the Project Director. Annual work and financial plans will be submitted to the Coordinating Committee (CC) for approval. When approved, the component managers will be responsible for day-to-day operations of the component. Problem resolution and necessary changes in Work Plans, or changes in budget, will be handled/approved by the overall Project Director.

This component will be implemented through the ARC Extension Affairs Division (ARC/EAD). A prime contractor will be responsible for assisting the ARC/EAD in implementation. The contractor will be responsible for obtaining and providing to the component, all offshore procurement of technical assistance (except for vans and motorcycles), training, and commodities. The services of the prime contractor will be obtained through a Host Country contract.

This component will require the full time attention of one U.S. direct hire and one FSN.

2. Annual Work and Financial Plans

The basic management tool for the component is the Annual Work and Financial Plan. A Life-of-Project Plan will be prepared by the ARC/EAD assisted by component provided TA. The implementation control mechanism will be Annual Work and Financial Plans at the Central level and for each Governorate, when approved, that will permit the component manager to proceed on implementation with a minimum of additional approvals.

In initial stages of implementation, a detailed quarterly work plan will be used rather than an annual work plan.

There will be annual in-depth (GOE/USAID/Contractor) review/planning meetings. Prior to the meeting, project personnel will submit annual reports on progress, problems and suggested modifications to the Work Plan. Discussion will result in an annual Work Plan to be submitted for administrative approval. Semiannual reviews will be conducted as desirable.

3. Procurement Plan

Open competition for Host Country contract is proposed for the prime contractor. Procurement agents or subcontractors may be proposed to carry out commodity procurement. Academic training will be through the prime contractor. A separate contract will be required to provide the governorate planning TA because of the desire to get the decentralized planning process underway as soon as possible.

Approximately $1 million of the dollar funds will be set aside for possible work orders, centrally funded project "buy ins," generic USDA/PASA "buy ins" or possibly included in the prime contract for USAID/GOE initiated activities.

Dollar financed local currency contracts for procurement and construction will be managed in accordance with standard GOE and USAID regulations.

B. IMPLEMENTATION BY ELEMENT

1. Technical Assistance

a. Long Term

The long term TA team will be composed of three persons. A chief of Party/Technology Transfer Systems Specialist will work closely with the ARC Extension Affairs Director and the



-101-

Supreme Council for Agricultural Extension. The Chief of Party will be responsible for assisting the EA Director in the overall implementation and administration of the component. The other two technology transfer specialist team members will be assigned responsibility for assisting with implementation of the governorate plans and non-public technology transfer grants.

b. Short Term

Short term technical assistance candidates will be selected/approved by the ARC/EAD from lists of specialists provided by the prime contractor. Wherever possible short term technical personnel will be contracted for recurrent short assignments over a long period of time. The frequency and duration of assistance will be determined by the ARC/EAD. Each unit of short term TA help analyze, plan, and propose solutions; conduct training; provide specific technical advice; and help link with sister institutions in the U.S. These short term TA will not implement programs or activities. They must be linked to a long term advisor or a counterpart that is identified in advance and is willing and able to follow through on the recommendations.

It is anticipated that most of the short term technical assistance will come from U.S. universities. The ARC/EAD will submit an annual plan for short term TA. The AID Component Officer will approve the plan. Changes to the plan will require joint approval.

c. Decentralized Planning TA

Technology transfer activities at the governorate level will be strengthened through a guided planning process. Each agricultural governorate may submit a plan for a locally based, technology transfer program involving technical, economic, social and other information to be transferred to farmers. The plan will cover up to five years and will be prepared along guidelines (see Appendix 3 for an outline of the guidelines) provided to the governorate by the Supreme Council for Agricultural Extension. These guidelines will include procedures for involving private agricultural groups and other government agencies with the local agricultural extension service in a program for getting information and problem solving guidance to farmers.

The responsibility for preparation of the plan rests with the Governorate Under-Secretary of Agriculture and the Extension Director. The plan will be prepared under the guidance of, and approved by, the Governorate Agricultural Extension Council in each governorate. The Under-Secretary will submit the plan for approval by the Supreme Council for Agricultural Extension.

The necessary short term planning TA will be provided to Governorate staff working with Egyptian extension and training professionals that would also provide necessary translation and interpretation services.

2. Training Plan

a. Long Term

(1) Degree Training

Nine M.Sc. candidates will be trained during the life-of-project. Additional graduate degree training is to upgrade and restructure the applied, and adaptive technology transfer techniques and methods used in Egypt. Graduate degrees will be in the area of: extension organization and management, research dissemination, agricultural communications, rural sociology, mass media, agricultural extension, agricultural education, adult education and educational psychology.

The selection criteria for degree candidates will be stated in the Training Implementation Plan prepared by the ARC/EAD. The job title and responsibilities should form the basis of a prescriptive, individualized Candidate's Training Plan for each candidate selected. These criteria will describe, to the extent possible, the ultimate job title and responsibilities of the candidates upon return to full-time work.

After candidates are identified, they will be released from full-time employment responsibilities and placed in one of several intensive English language training programs offered. This should occur as soon as the Project Amendment is approved.

A portion of the training budget will be set aside for invitational travel for U.S. academic advisors and Egyptian advisors to travel to each other's institutions. All advanced degree research will be based on research topics that address real problems and research priorities associated with technology development and transfer in Egypt.

(2) Post Doctoral

Five postdoctoral fellows will be trained in the U.S. or at International Agricultural Research Centers. The training will focus on specific critical skills needed for implementing particular aspects of the technology transfer program.

b. Short Term

(1) Pre-service Training

Non-public extension service personnel as well as non-ARC SMS/research personnel will be included in the various short-term training programs.

All MOA personnel recruited to assist with technology transfer activities will complete a pre-service orientation course. The length of the basic pre-service course should not extend beyond 3-5 weeks. Topics covered include introduction to technical backstopping and training for technical transfer; instructing farmers on using the technical packages; troubleshooting; and record keeping. Technical assistance provided by the general contractor wi l be used to help the ARC/EAD formulate training policies, selection criteria for trainees, and develop pre-service curriculum.

Subject Matter Specialists will receive training in designing technical packages that can be understood by the extension agents and they can interpret for farmers. Where possible, private sector companies, who are qualified to deliver the pre-service training courses will be used.

Subject Matter Specialists (SMSs) will train village level agents from public and non-public extension agencies. The SMSs will receive assistance from the contractor through pre-service, in-service training and supervisory follow-up; and instructional materials from NARP through the ARC. ARC senior research staff and Egyptian university faculties of agriculture will provide some of the in-service training and technical backstopping for SMSs'. Base upon the governorate plans special training programs will be conducted to develop a cadre of SMSs from district technical staff, governorate personnel from non-public extension agencies, and selected field agents.

Courses will be organized following proper training needs assessment done under the supervision of AERDRI. The curriculum developed for short-term non-degree training courses will be straightforward, minimally theoretical, maximum practical. Course objectives and lessons will apply to learning how to rapidly deploy the different technical packages, troubleshoot problems, working as a team, and keeping and analyzing farm records to make management decisions. Performance criteria will be used to monitor the effectiveness of the pre-service training program.

Instructional modules will be developed. These modules will be assembled, tested and deployed throughout Egypt. Approximately 100 training modules will be developed during the

life-of-project. The content of the modules will be based on the knowledge skills and attitudes needed to improve the technology transfer process. The Financial Plan lists the number of trainees for pre-service training during the life-of-project.

Appendix H contains a draft first year training plan. This will be reviewed, revised, and monitored by AERDRI on a regular basis.

(2) In-Service Training

In-service instruction will provide staff from the public extension service and non-public extension agencies with the latest information on materials and methods that comprise the technical package. It consists of formal and non-formal instruction. The formal training will be done on a scheduled basis as arranged by the AERDRI. The training for field staff will provide instruction and controlled practice in promoting and deploying the technical packages. For management, frequent in-service seminars and professional development short courses will provide scientists and administrators feedback on their work and help strengthen their ability to perform technology transfer activities.

In-service training will be provided to field and support staff in the ARC, PBDAC, MOA, PWWR, other relevant ministries, and nongovernmental groups. The Training Implementation Plan will develop and explain fully the annual sequence of in-service courses. For field staff courses will be based on relevant cropping systems and technical packages. Selected interventions to improve the efficiency of the methods used to enroll farmers in the on-farm demonstrations and deploy the technical package will also be included in the in-service curriculum.

Senior managers, key research scientists, subject matter specialists and others will participate in short-term, out-of-country training courses and other kinds of professional training opportunities. In-service training opportunities will be available from USDA courses, private agribusiness companies and cooperatives in the U.S., international agricultural research centers, and U.S. universities. The requirements and limits of out-of-country, short-term, and in-service training will be included in the Training Implementation Plan and subject to annual review by USAID and the MOA. Trainees who have passed the TOEFL and ALIGU can participate in out-of-country short-term training. The prime Contractor will also monitor language proficiency with the training needs.

(3) Observation and Invitation Tours, Conferences, and Short Courses

This training will provide opportunities for heads of departments, Under-Secretaries, researchers, senior MOA employees, administrators, senior staff from non-government associated groups, and policy makers to familiarize themselves with new technology transfer and management concepts. Conferences, tours, and seminars allow decision-makers the opportunity to focus on problems and solutions related to increasing agricultural information dissemination.

Invitational-type travel will be arranged by the prime contractor with assistance from USAID for a limited number of senior administrators, scientists, and key decision-makers. This travel will be to countries where new technology relevant to Egypt's agricultural sector exists. The prime contractor will arrange for medical insurance for all participants in observational and invitational travel. Project Management will debrief all participants and provide USAID/Cairo and the MOA with a synopsis of the program and participant's reactions. USAID and the MOA will provide opportunities for follow-up seminars and informal discussions with participants.

(4) Non-Formal Farmer Training

There will be two types of farmer training: (1) the continual one-on-one instruction that the VEWs (from public and non-public extension agencies) and SMSs deliver in field visits to block and individual farmers; and (2) training sessions for groups of farmers covering general problems and new strategies. The field staff will utilize the Village Council to encourage growth in local leadership capacity. They will be supplied with audiovisual aids and other instructional supplies to conduct farmer training sessions. Farmer training sessions will be given prior to the next cropping season to explain the technical recommendations. Other training sessions will be scheduled by local staff to accommodate special agro-climatic and social-cultural situations, based upon the governorate plans.

The component goal is to provide non-formal farmer training experiences to 30 percent of all farmers annually. This includes programs aimed at women, and newly graduated (B.Sc.) young people.

C. IMPLEMENTATION SCHEDULE

| DATE | ACTION | RESPONSIBILITY |
|---|---|---|
| 3/88 | Project Amendment Approved | MOA/USAID |
| | 8-A firm contracted for pre-implementation | MOA/USAID |
| | Target Governorates selected | MOA |
| 4/88 | RFTP for TA drafted | USAID |
| | AERDRI begins 1st Study | MOA |
| 6/88 | Governorate Plans drafted | Contractor/MOA |
| 7/88 | IFB on Renovation of Governorate facilities issued | MOA |
| 8/88 | RFTP advertised | MOA/USAID |
| 9/88 | Training Plan drafted<br>Degree Candidates identified | MOA |
| | Governorate Plans approved/<br>Funding approved | USAID/MOA |
| 10/88 | Procurement committee reviews Commodity Requests | MOA |
| 12/88 | Commodities ordered | USAID/MOA |
| | TA Proposals reviewed | MOA |
| 1/89 | Postdoctoral candidates identified | MOA |
| | Semiannual working group reviews annual plans | USAID/MOA/Contractor |
| 2/89 | AERDRI begins 2nd Study | MOA |
| | Internal Review | MOA/USAID |

COPYEXTN. Doc 2/25/88

| | | |
|---|---|---|
| 4/89 | Renovation Contract signed | MOA/Contractor |
| 6/89 | Long-term TA arrive | Contractor |
| 7/89 | Annual Plans drafted | MOA |
| 8/89 | Annual Plans reviewed/approved | MOA/Contractor |
| 10/89 | TA LOP Plans drafted | MOA/Contractor |
| 2/90 | AERDRI begins 3rd study | MOA |
| | Internal Review | USAID/MOA/Contractor |
| 6/90 | Annual Plans drafted | MOA |
| 7/90 | Annual Plans reviewed/approved | MOA/USAID |
| 2/91 | AERDRI begins 4th Study | MOA |
| 3/91 | Internal Review | MOA/USAID/Contractor |
| 5/91 | Annual Plans drafted | MOA |
| 6/91 | Annual Plans reviewed/approved | MOA/USAID |
| 10/91 | 1st Evaluation conducted | USAID/MOA/Contractor |
| 2/92 | AERDRI begins 5th Study | MOA |
| | Internal Review | MOA/USAID/Contractor |
| 4/92 | Annual Plans drafted | MOA |
| 5/92 | Annual Plans reviewed/approved | USAID/MOA |
| 9/93 | PACD | USAID |
| 03/88 | Participating Governorates Identified | MOA/AID |
| 05/88 | Short-Term Mode Established | MOA/AID |
| 06/88 | R/E Centers Identified | MOA/AID |
| 07/88 | Contract for Short-Term TA begins | MOA/AID |
| 08/88 | Action-Oriented Studies Annual Plan Approved | MOA/AID |
| | Short-Term Specialists Arrive | MOA |

COPYEXTN. Doc 2/25/88

108

| | | |
|---|---|---|
| 09/88 | Governorate Work Plans Prepared | MOA/AID |
| 10/88 | R/E Center Work Plans Prepared | MOA |
| 11/88 | Special Group & Innovative Program Operational Manual Prepared | MOA |
| 12/88 | Non-Public Extension Grants Program Operational Manual Prepared | MOA |
| 12/88 | Governorate Work Plans Prepared | MOA |
| 01/89 | In-Country Training Plan Approved | MOA/AID |
| 02/89 | Long-Term TA RFTP Advertised | MOA/AID |
| 03/89 | Admin Unit Staff Identified | MOA |
| | Admin Unit Office Equipment Purchased | MOA/AID |
| | Office/Computer Procurement Plan Approved | MOA/AID |
| 04/89 | Renovation Plans Approved | MOA/AID |
| 05/89 | Mass Media Equipment Procurement Plan Approved | MOA/AID |
| 05/89 | TA Contractor Selected | MOA |
| 06/89 | Master Training Plan Approved | AID |
| 06/89 | Long-Term Candidates, Post Doctoral, Short-Term Selected | MOA |
| 06/89 | Operations Manual for Special Group and Innovative Programs Prepared | MOA |
| 06/89 | Non-Public Extension Grants Draft Plan Reviewed | MOA |
| 07/89 | In-Country Contractors Selected | MOA |
| 08/89 | R/E Center Annual Review | MOA |

| | | |
|---|---|---|
| 09/89 | Renovation Contract Advertised | MOA |
| | Computer IFB Prepared/Issued | MOA/AID |
| | Office Equipment Purchased | MOA |
| | Second Year Action Oriented Studies Plans Approved | AID |
| | Special Group/Innovative Program Proposal Submitted | MOA |
| | Second-Year Governorate Plans Approved | MOA |
| 10/89 | TA Team Arrives | Contractor |
| | New Public Grants Plans Finalized | MOA |
| | In-Country Training Contract | MOA |
| | English Training Begins | MOA |
| | Vehicle Procurement Approved | AID |
| 11/89 | Renovation Contract Advertised/ Negotiated | MOA/AID |
| | Office/Computer Equipment Contractor Selected | MOA/AID |
| | Mass Media IFB Prepared/Issued | MOA/AID |
| 12/89 | Non-Public Grants Plans Approved | MOA |
| | Non-Public Advance Issued | MOA/AID |
| | Action Oriented PIL and Advance Issued | MOA/AID |
| 05/90 | Renovation PIL Studies Issued | AID |
| 06/90 | Annual Review Special Group and Innovative Programs, Proposals Solicited | MOA/AID |
| | Action Oriented Annual Plan Approved | AID |

| | | |
|---|---|---|
| 08/90 | Action Oriented PIL Studies Issued | AID |
| 09/90 | Office Equipment Delivered | MOA |
| 10/90 | Governorate Program Work Plan Approved | MOA/AID |
| 12/90 | Non-Public Grants Annual Review | MOA/AID |
| | Vehicle Contractor Selected | MOA |
| 03/91 | Special Group and Innovative Program Proposals Solicited | MOA |
| | Special Group and Innovative Program Proposals Submitted | MOA |
| 06/91 | Action Oriented Annual Plan Approved | MOA/AID |
| 08/91 | Action Oriented Studies PIL Issued | AID |
| 10/91 | Governorate Program Work Plan Approved | MOA/AID |
| | Mass Media Equipment Arrives | |
| 12/91 | Special Group and Innovative Program Proposals Awarded | MOA |
| | Non-Public Grants Annual Review | MOA/AID |
| 02/92 | Renovation Contract Executed | Contractor |
| 03/92 | Vehicles Arrived | Contractor |
| 06/92 | Action Oriented Annual Plan Approved | MOA/AID |
| 08/92 | Action Oriented Studies PIL Issued | AID |
| 10/92 | Governorate Program Work Plan Approved | MOA/AID |
| 12/92 | Non-Public Grants Annual Review | MOA/AID |
| | Special Group and Innovative Program Proposals Awarded | MOA |
| 08/93 | Non-Public Grants Final Review | MOA/AID |

## IV. COST ESTIMATES AND FINANCIAL PLAN

The total cost of the component is estimated at $107 million. AID will provide a grant of $80 million. The GOE contribution will be $7 million in cash plus $20 million in kind.

### A. COST ESTIMATES

Tables 2, 3, 4, and 5 detail expenditures for TA, training, commodities, and services. The cost estimates used in this paper have been developed based on an analysis of historical cost data used in implementing other AID projects. The cost coefficients used are given in each Table.

The current costs (1987 prices) of local cost items were adjusted for a rate of inflation of 12% for 1989, 10% for 1990, and 8% for 1991 thru 1993. Adjustment was also made to reflect the fluctuations of the exchange rate for purchase of LE with AID dollars; rates used are 1987: LE. 2.20, 1988: LE 2.42, 1989: LE 2.64, 1990: LE. 2.90, and 1991 thru 1993: LE 3.00. These LE adjustments were made for both AID and GOE cash contributions. GOE in-kind contributions were net inflation adjusted and were based on LE 2.20 rate of exchange. On the dollar cost items a compound inflation rate of 5% was used. These inflation and exchange rate adjustments are presented in Table 1 under the inflation line item. A contingency line item is also presented in Table 1 to establish a contingency fund of 5%.

### B. CONTRACTING AND FINANCING METHODS

#### 1. Contracting Methods

##### a. Technical Assistance

Open competition for a Host Country Contract is proposed for the prime contractor. The prime contractor will provide long-term and short-term technical assistance, placement and administration of the out-of-country training, and procurement of offshore commodities (directly or through subcontractors). The prime contractor will apply reduced overhead costs to the training and commodities costs, consistent with AID experience for similar items.

A separate AID direct contract will be used to provide the TA for governorate planning because of the desire to get the planning process underway as soon as possible.

An AID direct contract with an 8.A firm will be used for pre-implementation activities. Eighteen man-months of short-term consultants will be required to do the specifications and tender documents for the prime contractor, procurement of vans and motorcycles, and the TA for governorate planning.

A generic PASA will be established by the project, and each component will be allowed to buy-in on an as-need basis.

b. Training

Out-of-country training will be through the prime contractor. In-country training will be arranged by the host government through contracting with GOE institutes, GOE training centers, and the private sector.

c. Commodities

Offshore procurement except for motorcycles and vans will be through the prime contractor.

Procurement of vans and motorcycles will be through IFBs prepared by the pre-implementation contractor which will lead to awarding Host Country Contracts to the successful bidders. This procurement will use AID REG.I. procedures.

Procurement of local commodities will be made by the host government utilizing AID-financed procurement procedures established in Handbook 11, Chapter 3. This includes prior AID approval of all commodity procurement and awards in excess the Egyptian pound equivalent of $100,000.

## Appendices

1. Recommendations of the Agriculture Extension Consultants Work Group Arranged under Ministerial Law No. 5 for 1987.

2. Guidelines for Submitting Proposals for Innovative Program Grants, Non-Public Agency Grants and Special Group Programs.

3. Guidelines for Preparing and Submitting Governorate Technology Transfer Plans and Proposals.

4. Illustrative Action-Oriented Studies to be Done by AERDRI.

5. Scopes of Work for Long-term TA.

6. Selected References.

7. Overview of Non-Public Extension Service Agencies.

8. Draft First Year In-Country Training Plan.

9. Detailed Budgets.

RECOMMENDATIONS OF THE AGRICULTURAL CONSULTANTS WORK GROUP ARRANGED UNDER MINISTERIAL LAW NO. 5 FOR 1987

Appendix -

Unofficial Translation

[illegible] July, 1987

Corrected 29 November 1987

Report Submitted to His Excellency
Prof. Dr. Wally, Deputy Prime Minister
and Minister of Agriculture and Land Reclamation

Recommendations of the Agriculture Extension Consultants Work Group Arranged under Ministerial Decree No. 5 for 1987.

1. Under the Ministry's Decree No. 5 for 1987, the Agricultural Extension Consultants Group has been organized under the chairmanship of Dr. Ahmed Momtaz Aly Hafez, Deputy Director of ARC, and membership of the following candidates:

- Dr. Ahmed Farid el Sahrigi, Director of the Mechanization Research Institute;
- Dr. Abdullah Nassib, Director of FORI;
- Dr. Mohamed Shafieh Salaam, Deputy Director of Agric. Extension and Rural Development Research Institute;
- Accountant Mohamed Kamal Naser, Head of the Credit Department, Agric. Development of Credit Bank;
- Eng. Mahmoud Nour, Director of the Central Administration for Horticulture and Vegetable Crops & Director of the Small Farmer Project;
- Dr. Saleh Hassan Farrag, Director of Agri. Directorate, Assuit Governorate;
- Eng. Alaa el Din el Sonbatty, Director of Agric. Directorate, Kafr El Sheikh;
- Eng. Abdel Aziz el Sayed el Sagheer, Director General, Agric. Extension Directorate, (Secretary).

APPNDICS.Doc. 1/22/88

The ministerial decree defined the role of the committee as follows:

A. Establish the control measures to link both the General Directorate for Agriculture Extension and the Credit Research Authorities;

B. Adapt the Annual Agriculture Extension Program which helps in executing the Ministry's strategy for Egyptian Agriculture;

C. Establish special training program for the Agric. Extension Authorities on multi levels. Recommend and prepare specialized trainees from the Agric. Extension Authorities for each Governorate;

D. Discuss the role of the Supreme Council for Agric. Extension.

2. The following activities were carried out by the working group:

A. The working group held its first meeting on 14/1/87. Different points of view and specializations were discussed. It was decided that:

Dr. Saleh Hassan Farrag and Eng. Alaa el Din el Sonbatty would develop a clear scope for the management of the General Directorate for Agric. Extension and its relationship to Agric. Credit to be discussed at the next meeting.

B. During the second meeting held 31/1/87, suggestions submitted by Dr. Saleh Farrag, Abdullah Nassib, Eng. Alaa el

Din el Sonbatty, Abdel Aziz el Sagneer and Eng. Mahmoud Nour on how to join research, extension and credit with other organizations were reviewed.

C. The team reviewed and went through all group expectations given by the members during a meeting which was held on 5/2/87.

D. During the final meeting held on 22/4/87, previous recommendations were called for discussion and approved before submitting it to Your Excellency.

3. The following are the recommendations approved by the team work defining specialization of each member as stated in the Ministerial Decree.

## First Recommendation

A. Establish a Supreme Council for Agriculture Extension under the chairmanship of Dr. Youssef Wally, Deputy Prime Minister and Minister of Agriculture and Land Reclamation.

The council will include representatives from the Ministry of Agriculture and affiliated authorities, including:

- Director of ARC;
- Chief of the Board of Directors of the General Authority for Land Reclamation;
- Chief of the Board of Directors of the General Authority for Veterinary Science;
- Chief of the Board of Directors of the Agriculture Development Credit Bank;
- Chief of the Board of Directors of the General Authority for Land Development;



118

- Chief of Board of Directors of the General Organization for Aquatic Wealth;
- Director of the General Authority for Agricultural Development;
- Director of the Central Administration for Horticulture;
- Director of the Central Administration for Animal Production;
- Director of the Central Administration for Soil Testing;
- Director of the Central Administration for Cooperatives;
- Director of the Central Administration of the Minister's Bureau;
- Director-General of Agric. Extension.

The consultants work team as arranged and stated in the Ministerial Decree No. 5 for 1987 include:

1. <u>From the MOA--</u>

- Dr. A. Momtaz Aly Hafez, Deputy Director of ARC;
- Dr. A Farid el Sahrigi, Director, Agric. Mechanization Institute;
- Dr. Abdullah Nassib, Director of FORI;
- Dr. M. Shafie Salaam, Deputy Director Agric. Extension and Rural Development Research Institute;
- Accountant Saleh Hassan Farrag, Director of Ag. Directorate, Assuit Governorate;
- Eng. Alaa el Din el Sonbatty, Director of Agric. Directorate, Kafr el Shiekh;

2. <u>Scientific Research Authorities outside the Ministry of Agriculture--</u>

- Director of Food Research Council, Academy of Science Research and Technology;
- Director of Agric. Branch, the National Research Center;

- Director of Water Research Center, Ministry of Irrigation;
- Dr. Ahmed Mohamed Omar, Faculty of Agric., Aznar University;
- Dr. Hussein Zaki el Kholy, Faculty of Agric., Cairo University;
- Dr. Khairy Hassan Abou el Seoud, Faculty of Agric., Cairo University;
- Dr. Ibrahim Saad el Din Moharran, Faculty of Agric., Ain Shams University.

3. Publicity--
- Director General of El Shaab Broadcasting Corporation;
- Director of Programs, Directorate in TV, Rural Programs/Agric. Programs;
- Chief of the Board of Directors of the Cooperative Newspapers;
- Director, Editorial Board, Agric. Magazine;
- Director of Editorial Board of the Cooperative Newspaper;

4. Farmers--
- Farmer Trustee;
- Secretary General, Central Agric. Cooperative Union.

5. Outside personnel with Agric. Experience

B. The Supreme Council for Agric. Extension will approve the following items:
- Annual and seasonal extension programs and their recommendations;
- The national campaign for developing agriculture production;
- The national policy for Agric. Extension;
- Funding sources and incentive rules for farmers and working staff;
- Extension plans for the Governorates.

APPNDICS.Doc. 1/22/88

C. The Supreme Council for Agric. Extension will meet every 3 months.

D. The Director General of Agric. Extension will follow the activities of the Council.

Second Recommendation

The General Directorate for Agric. Extension must be re-shaped according to the attached organizational structure.

Third Recommendation

A. Establish a Regional Extension Council in every Governorate under the chairmanship of the Agric. Dept. Directorate in the Governorate with the Agric. Extension Director represented by the different authorities in the Supreme Council for Agric. Extension at the Governorate level.

B. The regional Supreme Councils for Agric. Extension will carry out the following activities:
- Suggest the extension plan for each Governorate and submitting it to the Extension Supreme Council for approval;
- Follow up on the execution of the national campaigns and extension program which has been approved by the Supreme Council for Extension;
- Support the recommendations connected to agricultural problems in the Governorates when discussed during the Supreme Council meetings.

APPNDICS.Doc. 1/22/88

121

## Fourth Recommendation

A. Establish different research groups in each governorate from research authorities located in the governorates to cover all field crops, horticulture, plant protection, soil and water, animal breeding, agric. mechanization, and other research specialities.

B. Every research working group will regularly visit the production areas in the Governorates and then submit their reports to the Regional Extension Council in the Governorate to settle the problems.

## Fifth Recommendation

As for training, the working group will prepare and carry on the following training programs periodically according to the recommendations made by the Extension Supreme Council:

A. Central Level--

- All the Extension Directors in the Governorates will be trained in one session or perhaps two arranged by the Agric. Extension Research Institute and other Research Institutes at the ARC in one of the Ministry's Training Centers;

- Training programs should be of high academic standards that covers all branches and agric. components;

- Nominate the distinguished staff who have proved to have made an active contribution in developing extension in their governorates. This will enable them to travel abroad to identify and study the different methods and standards of extension service outside the country in order to improve their extension leadership.

APPNDICS.Doc. 1/22/88

B. Regional Level---

- The Agric. Extension Research Institute in collaboration with other research sections at ARC and the different outside institutes will prepare and arrange practical training sessions for the Extension Inspectors and the Directors of the agric. cooperatives at the regional research stations;

- The training sessions should cover the training programs that will improve the extension capabilities of the extension staff towards the Egyptian Village;

- Establish fixed guidelines and standards for evaluation.

C. Village and Farmers Level---

- The Agric. Directorate at the centers will select the farm leaders and arrange for them guidance programs to accelerate competition between the villages and farmers in increasing agricultural production;

- Arrange and select demonstration fields for the different agriculture production activities in the villages and centers, and arranging field visits to them;

- Concentrate on rural clubs, youth sports clubs and agric. units as centers of communication to that level of training;

- Arrange special training programs to be carried out by the agric. village and social advisors to develop the rural woman concepts and lead her to the modern techniques of home economics and difference aspects of agric. production.

## Sixth Recommendation

Establish and execute a fixed plan to support the available possibilities in the extension sector:

A. Means of transportation for the different categories of the extension authorities;

B. Audio visual aids;

C. Posters, brochures, prints, and all kinds of publications;

D. Increase use of the rural mass media through contribution of all research specialist to its programs;

E. Provide all the backstopping requirements and guidance of the extension service in the governorates from the central level with all its divisions and specialties.

## Seventh Recommendation

As for the National Campaigns it should consider the following items:

A. National campaigns should have certain means and targets;

B. Select the national authorities which will contribute to implement the campaigns;

C. Evaluate each campaign with its negative and positive sides;

D. Provide all resources needed for success before starting the campaign.

## Eighth Recommendation

### A. Regional Level Extension Organization---

1. The Director of Agric. Extension Services in the Governorate is affiliated directly to the Director of the Agric. Directorate;

2. All Extension Directors in the Governorate are on General Director category or level;

3. The Extension Service Director in each Governorate supervises inspectors in three centers;

4. The relation between the Extension Service Director in the Governorates must be direct with the Regional Extension Council;

5. The Director of the Extension Service in the Governorates must have a direct relation with the Agric. Credit Bank in the Governorate and act as executive officer for the national campaigns to all crops under the chairmanship of the Agric. Directorate Director.

### B. Agric. Extension at the Administrative Level--

1. The Agric. Extension Service Inspector must be in direct touch with the Agric. Directorate, Director of Extension Service in the Governorate, and the Credit Bank in the center and the other departments through the Director or Head of the Agric. Directorate.

2. Deputy Director is chosen by every four villages or divisions in the Governorate.

APPNDICS.Doc. 1/22/88

C. Agric. Extension at the Village Level--

1. Village field area is distributed among the Agriculture Supervisors in a way that each supervisor overseas from 300-400 feddans where he can apply and practice his field of specialty;

2. The most senior is chosen as the head extension officer in the village;

3. All Extension Service Officers, each in his own specialty, communicate with village bank representatives and the cooperative society to organize the work and provide production requirements, and apply technical recommendations;

4. They are also responsible for arranging meetings and carrying out extension programs and plans in collaboration with the instructors/leaders in the village. This group is directly related to the Deputy Director, Agric. Extension Sector in the Center.

D. Director of the Agriculture Cooperative Society--

He is directly affiliated to the Director of the Ag. Directorate and is only concerned with administrative work.

Kindly take notice

Deputy Director
Head of Consultants Team
Dr. A. Momtaz

APPNDICS.Doc. 1/22/88

126

Appendix I

# GUIDELINES FOR SUBMITTING PROPOSALS FOR INNOVATIVE PROGRAM GRANTS, NON-PUBLIC AGENCY GRANTS AND SPECIAL GROUP PROGRAMS

**Doc. TECHNLSK, 01/08/88**

Annex 2

Guidelines for Submitting Proposals for Innovative Program Grants

Non-Public Agency Grants, and Special Group Programs.

**Doc. TECHNLSK, 01/08/88**

128

DRAFT MANUAL FOR TECHNOLOGY
TRANSFER GRANTS

These comments pertain to Innovative Program Grants, Non-Public Agency Grants, and Special Group Programs only. Governorate plans will be handled under a separate set of procedures. While it is understood that there are inherent differences among these three activities they will be treated equally for the purpose of this draft.

Short term technical assistance may be required to assist project management fully develop these procedures and guidelines.

**Doc. TECHNLSK, 01/08/88**

PROPOSED TABLE OF CONTENTS

INTRODUCTION

SPECIFIC RULES

PROPOSAL FORM - GENERAL COMMENTS

GRANT PROPOSAL FORM

GRANT EVALUATION FORM

Doc. TECHNLSK, 01/08/88

INTRODUCTION

The grants program under the technology transfer component is designed to facilitate research by universities, private groups, non-profit (PVO) groups, private sector, mass media entities, and other organizations involved in technology transfer.

Major emphasis for grants include the following:

- those activities which show an ability to make substantial progress during the proposed time frame.
- those activities that deal with particular problematic issues - either agricultural or social.
- those activities which are both replicable and sustainable.

The bulk of the funding will be for operational costs of the proposed activities. Limited amounts will be available to cover specialized equipment, improved facilities, and out-of-country consultants. Each item in these areas must be justified and must be related closely to the proposed activity.

SPECIFIC RULES

All research proposals and related documents and all required reports must be in English. All project-related correspondence should be in English.

Each submitted proposal must be approved by the ranking individual of the organization or equivalent official.

Each proposal must specify one Activity Director who will have overall responsibility. Use of one or more co-directors is not permitted. However, a Deputy must be specified. This person will become the Principal Investigator if the initial Principal Investigator is unable to serve.

Doc. TECHNLSK, 01/08/88

No person can be an Activity Director for more than one grant.

For certain proposals with broad objectives, particularly when more than one institution is involved, a coordinator must be appointed. The coordinator will arrange for and chair regular meetings involving all relevant involved parties and possibly other senior staff to discuss plans, procedures and any problems that may arise and will prepare summary reports covering all phases of the activity.

If more than one administrative unit collaborates in one proposal, each one must prepare a plan of work and a budget to cover their activities. Likewise, each must prepare required reports for their phase of the research. These will be consolidated by the Activity Director into one report.

Twice-per-year on-site visits are planned by the NARP staff. Advance notice will be given and full cooperation will be expected in connection with these visits. A senior official from each activity should be available for each visit to discuss and explain ongoing activities.

Failure to perform planned activities, to cooperate on site or to provide required reports on schedule will result in a discontinuance of NARP funding and cancellation of the NARP grant. Any funds on hand for which acceptable receipts are not available must be refunded to NARP in such cases.

At the end of the project, any equipment purchased with NARP funds becomes the property of the involved organization responsible institutional unit.

Doc. TECHNLSK, 01/08/88

Commodities from the USA will be requested through the NARP procurement facilities. Delivery from date of ordering will likely take 9-12 months.

Applicants for out-of-country visits or training must meet USAID and Egyptian requirements. Arrangements will be made through the NARP staff. At least several months must be allowed for necessary clearances for any given trip. Any consultants brought to Egypt to provide training also will be handled through the NARP staff.

No new construction is allowed under the Grants Program. Some refurbishment may be justified. All materials for these facilities must be from Egyptian sources. Funds for facilities, if approved, will be part of the operational budget.

Grant Proposal Form: General Comments

The following relate to items on the Grant Proposal form:

Proposal No: This is included in the NARP letter requesting a full proposal and will be identical to the number assigned to the initial proposal.

Lead Unit: Normally this will be the organization of the Activity Director.

Project Title: A brief, clear, specific designation of the activity. The title, used by itself, should give a good indication of what the project is about. All activities related to Egypt; thus this need not be indicated in each title.

Doc. TECHNLSK, 01/08/88

Duration: Each project should indicate the time required for completion. Grant projects must end by December 1992, but may terminate sooner. Funding will be on an annual basis and subject to an approved evaluation. Priority will be given to projects of one to three years duration.

Objectives: A clear, complete and logically arranged (outline form) statement of the specific objectives (outputs) of the project.

Purpose Scope and Justification: State the purpose, scope and justification of the activity. The justification should present the importance of the problem, reasons for doing the work, such as the needs the activity fulfill and the importance of doing the work now; and ways in which agricultural sector and farmer productivity will be advanced.

Previous Recent Work and Present Outlook: A review of the similar activities should be presented, especially those efforts during the last five years. Cite and discuss the most important and recent results that relate to the proposed activities, the status of current activities and the additional information needed, to which the project is expected to contribute.

General Statement of Procedures and Methods: A statement of the essential working plans and methods to be used in attaining each of the stated objectives. The procedures should correspond to the objectives (outputs) and follow the same order. Methods should be described for each year of the project and should be summarized on the "Workplan Summary Activity Chart". This chart must be prepared for each involved organization.

Doc. TECHNLSK, 01/08/88

On-farm trials and/or demonstrations or other outreach activities should be expressly articulated. An economic evaluation of effects on net farm income must be included. Priority will be given to projects that could potentially increase net incomes within the NARP time frame.

Receipts must be provided on a monthly basis to the NARP Executive Office, ARC, for all operational expenditures.

Labor costs; expendable supplies; travel, transportation, and incidental expenses; repair and maintenance; and staff improvement will be handled under previously approved project policy.

**Doc. TECHNLSK, 01/08/88**

# TECHNOLOGY TRANSFER GRANT PROPOSAL FORM

A research proposal should accompany all requests for new or revised technology transfer activities. All proposals must be in English.

Proposal No. _____ Date submitted _____

Organization submitting _____

Activity Director _____

Lead unit _____

Activity title _____

_____

_____

Proposed starting date _____ Ending date _____

**Objectives:***

**Purpose, scope and justification:***

**Doc. TECHNLSK, 01/08/88**

Previous recent work and recommendations:*

General statement of procedures and methods:*

Detailed procedures:

Additional required forms are attached.

| Submitted by: | Approved by: |
| --- | --- |
| Grant Manager | Director of Organization |
| Title | Organization |

Doc. TECHNLSK, 01/08/88

# WORKPLAN SUMMARY ACTIVITY CHART*

Organization ----------

Discipline ----------

Planned Duration ----------

Planned starting date ------- Planned completion date ----------

Major Activities

| Activity No. | Description of activity | Expected duration (Months |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

Activity time span*

| Activity No. | July-June fiscal years | | | | |
|---|---|---|---|---|---|
| | 1987/88 | 88/89 | 90/91 | 91/92 | 92/93 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| Planned overall cumulative % complet. | | | | | |

Doc. TECHNLSK, 01/08/88

# INFORMATION SHEET FOR GRANT MANAGER

Name _____

Title _____

Organization _____

Office address _____
_____
_____

Organization's Prior experience (Emphasize those parts that relate directly to the proposed work to be done under this activity.)

Doc. TECHNLSK, 01/08/88

Experience (Con't)

Has prior work involved direct farmer contacts? Yes ____, No ___. If "Yes", what kind of contacts were involved?

_____

_____

_____

Planned staff to work under you for the activity.

| Name | Rank/Title | Experience |
|---|---|---|

TECHNOLOGY TRANSFER GRANTS PROGRAM
BUDGET SUMMARY BY FISCAL YEARS

Organization _____ Activity Title _____

| # | CATEGORY | 1987/88 | 1888/89 | 1989/90 | 1990/91 | 1991/92 | 1992/93 | GRAND TOTAL |
|---|---|---|---|---|---|---|---|---|
| I. | LABOR | | | | | | | 0 |
| II. | EXPENDABLE SUPPLIES | | | | | | | 0 |
| III. | TRAVEL, TRANSPORTATION, PER DIEM | | | | | | | 0 |
| IV. | INFORMATION DISSEMINATION | | | | | | | 0 |
| V. | STAFF IMPROVEMENT | | | | | | | 0 |
| V. | MISCELLANEOUS | | | | | | | 0 |

Proposal No. _____

TECHNOLOGY TRANSFER ACTIVITY EVALUATION FORM

Recommended action _____ Final score _____

Organization submitting _____

Activity Director _____

The following questions should be used to constructively evaluate the merits of technology transfer activity proposals. Please provide a brief, clear statement of response to each question after careful study of the project proposal. Provide a written response to each question rather than a "yes" or "no".

1. Summarize on a separate sheet the proposal statement of the problem to be solved and/or the nature of the technology to be transferred.

2. List the definable results being sought. For each one, are they reasonably attainable from the successful pursuit of this proposed activity? If so, describe how.

3. List the objectives (outputs) stated. For each one, are they sufficiently specific so that they could be accomplished within the duration of the proposed activity. Please explain for each.

Doc. TECHNLSK, 01/08/88

4. Are the suggested procedures reasonable and sound approaches to the accomplishment of each objective (output)? Please discuss in detail.

5. Explain how the methods (materials, media, demonstration days, etc.) provide desired results? Will economic evaluations be possible? Is information needed in additional areas?

6. Discuss whether the organization appears to have the competency necessary to complete the activity.

7. Will the project likely contribute significantly to new knowledge in the technology transfer area and/or encourage additional methods? If so, describe how this will be done.

8. When you have completed the above, please provide your numerical score on the attached score card.

In addition to your response to specific questions #1-8 above, reviewer comments are solicited on the following:

a. Suggest possible additional technology transfer techniques that might be utilized within or outside this proposal.

b. Add relevant comments and suggestions for the improvement of any deficiencies deemed to be important. Should the proposal be sent back for revision? If so, please indicate under "Recommended action" at the top of page 1 the words "Return for revision" and enter on a separate paper the kinds of revisions recommended.

Doc. TECHNLSK, 01/08/88

c. Should the proposal be dropped? If so, write "Recommended for non-funding" under "Recommended action." This could reflect one or more of the following:

- A low overall score, with no easy way to revise.
- Lack of facilities to do the work.
- Proposal relates to a commodity or area of little economic importance in Egypt.
- No significant results can be expected within the timeframe.
- Too theoretical to be funded.
- Duplicates work already being performed.
- Fails to relate closely to NARP objectives.
- Circumstances make the research undesirable at this time.
- Etc.

If to be non-funded, please provide a brief write up of the reasons.

Doc. TECHNLSK, 01/08/88

| Topic | Explanation | Max. Score | Assigned Score |
|---|---|---|---|
| Innovative approach | Does this duplicate or repeat prior on other on-going transfer activities? 10 implies no duplication, 5 describes partial duplication, 0 would be completed duplication, and no justification for further work. | 10 | |
| Well defined audience | 15 implies that the target audience is well defined and that adequate provisions are included to address any specific issues this audience may have. | 15 | |
| Problem well articulated with potential for high gains | Importance may relate mainly to the economic value of commodities being extended or the constraint being addressed, 20 implies a substancial anticipated increase in farmer adoption rates in this area. | 20 | |
| Substantial progress can be made during proposed time frame | A 15 implies a potential for significant adoption rates by the PACD. An 0 implies expected progress, but no immediate benefit. | 15 | |
| Proposal deals with issue of national importance | Adoption of technology relates to national welfare such as import substitution or to high net benefits to farmers who adopt the technology. | 15 | |

| Topic | Explanation | Max. Score | Assigned Score |
|---|---|---|---|
| Budget appears reasonable relative to expected results | A 10 implies significant results from a modest budget, taking account of both the operational budget and any requests for capital equipment and/or training. A 0 implies a budget that is too much high relative to anticipated results. | 10 | |
| Direct farmer contact planned | A 15 implies that much work will be done with the farmer, and that there will be a mechanism established to encorporate farmer feedback. A 7 implies direct farmer contract, but no feedback. | 15 | |
| | TOTAL | 100 | |

Drafted by: AGR/A:THardt:sk

Doc No. NARPPSCO

# GUIDELINES FOR PREPARING AND SUBMITTING GOVERNORATE TECHNOLOGY TRANSFER PLANS AND PROPOSALS

**Drafted by: AGR/A:THardt:sk, Doc. GOVPLAN2**

## DRAFT MANUAL FOR GOVERNORATE PLANS AND PROPOSALS

The Governorate plans and proposals are to serve as a base for the NARP technology transfer component to provide support to the governorate programs. It allows for difference approaches to technology transfer, subject needs, and organizational needs that exist among the governorates in Egypt.

Even though the proposal is what is ultimately funded, there are necessary preliminary steps the governorates must accomplish which are also described in these guidelines. These guidelines, when in final form, are specifically designed to be used by governorate officials with assistance from the central GOE units and TA project personnel. For the initial phase six governorates will be selected. Additional governorates, for a total of 20 by the end of project, are anticipated. An evaluation is planned for the end of year two.

Short term technical assistance may be required to assist project management fully develop these procedures and guidelines.

**Drafted by: AGR/A:THardt:sk, Doc. GOVPLAN2**

INTRODUCTION:

The government grants program under the technology transfer component is designed:

- to improve and expand and the capacity of local governments to: plan, manage, implement, and maintain locally chosen agricultural extension function activities; and;

- to improve the capacity of local government to mobilize local resources for the provision of extension functions, and to operate and maintain these functions efficiently.

The bulk of the funding will be for operational costs of the proposed activities. Limited amounts will be available to cover specialized equipment, improved facilities, and out-of-country consultants. Each item in these areas must be justified and must be related closely to the proposed activity.

**Drafted by: AGR/A:THardt:sk, Doc. GOVPLAN2**

GENERAL ORIENTATION AND TRAINING PLAN

Before beginning governorate plans, an orientation and training course will be offered.

Design

The proposed orientation program follows a three-phase process:

Phase one: Orientation Seminar for Senior Governorate Officials.

Phase two: Training of Trainers Seminars: trainers are to be trained in a residential training center.

Phase Three: Governorate Orientation Seminars: Seminars will be held in each of the participating governorates.

Objectives

o To familiarize governorate council members with relevant components of the program.

o To introduce the basic guidelines and procedures for project selection.

o To train participating governorate councils in the processes of needs assessment, project identification and preparation, and to provide a general briefing of project requirements. More specifically:

1. The project planning forms.
2. Project accounts and monitoring guidelines.
3. Preconditions for project funding.
4. Accounting guidelines

Drafted by: AGR/A:THardt:sk, Doc. GOVPLAN2

o To introduce a village-level multi-year plan for technology transfer.

o To reinforce a process of maximum and open communication networks of public and private sector organizations involved in agricultural technology transfer.

GOVERNORATE TECHNOLOGY TRANSFER PLAN

The first step for each governorate is to prepare an Annual Technology Transfer Plan (this may be part of a long term plan for technology transfer) which will serve as a base for preparing the proposal requesting funds from the NARP project component. The plan will be done under the guidance of the governorate councils with participation of the various public extension and non-public extension agencies, and the involvement of the district and village committees. The plan will:

A. Assess farmers technology needs and socio-economic conditions.

B. Review "technology opportunities" from research which may be introduced to farmers.

C. Establish program priorities for the governorate in which staff time and other resources will be given (the governorate program cannot do everything for everyone) which may include:

1. commodities (i.e., rice), specific programs (i.e., pesticide contamination), etc.

2. geographic regions in the governorate needing more assistance than others

3. groups of farmers needing special attention (young farmers, women farmers, etc.)

Drafted by: AGR/A:THardt:sk, Doc. GOVPLAN2

D. Establish targets for the priority programs which include:

(1) impact in the governorate (such as production increase for commodity, reduction of pesticide contamination).

(2) number of farmers participating or accepting the new practice

(3) participation of other groups in the governorate supporting the recommended practices.

(4) amount of associate inputs (such as credit, seed)

E. Prepare an Annual Work Plan which would contain for each of the priority programs:

(1) source of technical support (R/E Center, etc.)

(2) specific activities to be organized (i.e. field days, demonstration plots, farmer visits, group training, mass media)

(3) time table for the activities

(4) who is responsible for the activity and who else is involved (i.e. SMSs, non-public extension agencies, schools, local leaders)

(5) cost for carrying out the activity.

F. Summarize the human and financial resources needed to carry out the aggregated Annual Work Plan. Indicate for staff and money, how much will be provided by:

(1) governorate extension program

(2) other governorate public and private agencies

(3) agencies outside the governorate (i.e. R/E Centers, universities)

(4) needed from the NARP project component

G. Provide a plan for monitoring and evaluating the Annual Work Plan.

Drafted by: AGR/A:THardt:sk, Doc. GOVPLAN2

SPECIFIC GUIDELINES

All research proposals and related documents and all general required reports must be in English. All project-related correspondence should be in English.

Each submitted proposal must be approved by the Governorate Extension Council.

Twice-per-year on-site visits are planned by the NARP staff. Advance notice will be given and full cooperation will be expected in connection with these visits. A senior official from each activity should be available for each visit to discuss and explain ongoing activities.

Failure to perform planned activities, to cooperate on site visits or to provide required reports on schedule will result in a discontinuance of NARP funding and cancellation of the NARP grant. Any funds on hand for which acceptable receipts are not available must be refunded to NARP in such cases.

At the end of the project, any equipment purchased with NARP funds becomes the property of the involved governorate.

Finance

Each of six selected governorates will receive a basic allocation of LE ____.

Within each governorate, the funds are to be allocated in accordance with following conditions:

1. Up to 25 percent of the total governorate allocation may be used for subprojects in markaz and governorate capitals which directly support village subprojects in the villages falling under their jurisdictions.

Drafted by: AGR/A:THardt:sk, Doc. GOVPLAN2

2. Of the total allocation, regardless of the location of the planned subprojects, 25 percent of the governorate grant may be converted to U.S. dollars for importation of equipment from the USA.

Feasibility studies and pilot projects are eligible for funding from these allocations.

Preconditions for Disbursement

The Ministry of Planning (MOP) is required to provide a matching grant of five percent of the USAID contribution. These funds must be deposited into a special account and a bank certificate is required.

The five percent matching contribution from the governorate may be made from any source of funds at the disposal of the governorate. The governorate must provide a bank certificate showing this amount has been deposited in the special account.

Each governorate must have an O&M plan and budget. Each governorate must submit a quarterly report on the distribution and expenditure of funds according to the approved budget.

Each governorate must have an equipment inventory.

The governorate plan must be approved by the governorate Extension Council and reviewed by the Supreme Council for Agricultural Extension prior to final approval for funding from ARC and AID.

Each governorate will be responsible for meeting at least 50% of their projected project expenditures on an annual basis.

Drafted by: AGR/A:THardt:sk, Doc. GOVPLAN2

GOVERNORATE GRANTS PROGRAM

BUDGET SUMMARY DISTRICT

Activity Title (i.e., rice, chemical centamination)

| # | CATEGORY | Governorate | District I | District II | District III | GRAND TOTAL |
|---|---|---|---|---|---|---|
| I. | LABOR | | | | | 0 |
| II. | EXPENDABLE SUPPLIES | | | | | 0 |
| III. | TRAVEL, TRANSPORTATION, PER DIEM | | | | | 0 |
| IV. | INFORMATION DISSEMINATION | | | | | 0 |
| V. | STAFF IMPROVEMENT | | | | | 0 |
| V. | MISCELLANEOUS | | | | | 0 |

CRITERIA FOR EVALUATING REQUEST

While these grants will not be awarded on a competative basis, there still exists a need for standard criteria by which to review proposals for funding.

The following criteria will be used to evaluate the proposals:

A. Thoroughness of the farmers needs assessment and provisions to include farmer feedback 20%

B. Participation of public extension, non-public extension agencies, advisory councils, SMSs, R/E Centers and other research units, farmers, and other groups in the planning process, preparation of proposal, and involved in the implementation of the governorate (and, therefore, beneficiaries from NARP funds) 30%

C. The Technology Transfer Plan (priorities, activities, time table, etc.) 25%

D. Justification for inputs from NARP 15%

E. Monitoring and Evaluation Plan for the Governorate Plan and Proposal 10%

Drafted by: AGR/A:THardt:sk, Doc. GOVPLAN2

136

# ILLUSTRATIVE ACTION-ORIENTED STUDIES TO BE DONE BY AERDRI

## Illustrative Action-Oriented Studies to be Done by AERDRI

(NEEDS TO BE REWORKED WITH DR. SHAFIE)

(1) Inventory of Public and Private Sector Organizations:

A study will be designed to identify key public and private sector entities that could be involved in the agricultural technology system. Work will be none to determine the level each organization operates and functional activities performed (i.e. policy, research, formal education, non-formal training, extension field staff, communication, supply inputs, marketing, credit, data collection/monitoring). The major objective of this study is to ensure that the appropriate activities are aimed at the private sector involved in the technology transfer to increase their role.

(2) Capability Analysis:

Drawing upon accepted social science research analytical tools, analyze the capabilities of the key organizations involving the technology development, transfer and utilization interface. The purpose of this study is to determine how best to enhance the relative strengths of the key organizations involved.

(3) Trace Technology Flow:

This study involves tracing the development, approval, replication, transfer and utilization by farmers of specific technical innovations. The study will trace the introduction of innovations related to seed varieties, chemicals, and

cultural practices. The purpose of this study is to identify obstacles in the diffusion system which should be addressed.

(4) Identify Appropriate Linkage Mechanisms:

This study will focus on identifying specific activities where meaningful interventions can be made to improve the technology transfer system. Crucial elements are linkage mechanisms which make the various components, such as research and extension, and organizations in the public and private sectors better interact. Linkage mechanisms are often overlooked or are not recognized as such (i.e. training) or they are not tailor made for the specific component (i.e. market research, production, wholesaling, retailing). Attention will be placed on linkages at the local level to identify appropriate technology through communication media, extension field staff, and other relevant mechanisms.

## ILLUSTRATIVE ACTION-ORIENTED STUDIES TO BE DONE BY AERDRI

The Agricultural Extension and Rural Development Research Institute of ARC will conduct a series of action oriented practical studies to assist GOE policy makers, donors, program planners and managers, and others concerned with technology transfer to better understand the Egyptian agricultural technology system. These studies will be designed to determine where interventions should be made for strengthening extension-type programs.

The studies will follow the basic guidelines outlined below:

PRACTICAL - Provides government agencies and donors a base upon which better decisions can be made on where to make interventions.

COMPREHENSIVE - The technology transfer/extension component cannot be addressed in isolation of technology development, clientele groups, etc.

BALANCE - There must be a balance between the public and private sector institutions involved. Each perform important roles. Often these roles are not properly defined. The extension function cannot be carried out entirely by one or the other - public and private sectors both need to be involved.

INTERACTIVE - If the technology transfer/extension component is to operate effectively, the whole agricultural technology system must interact and be dynamic. Therefore, the role of linkage mechanisms is vital.

APPNDIXD, JAN 21, 1988

Long-term TA and short-term TDY will assist the Agriculture Extension and Rural Development Research Institute in research design, scopes of work, contracting for outside assistance if necessary, and reporting results. The project will support transportation requirements, data services, and other costs associated with data collection and analysis.

Illustrative studies are described below.

1. Private Sector:

A study will be designed to identify key private sector entities involved in the agricultural technology system. Work will be none to determine the level each organization operates and functional activities performed (i.e. policy, research, formal education, non-formal training, extension field staff, communication, supply inputs, marketing, credit, data collection/monitoring). The major objective of this study is to insure that the appropriate activities are aimed at the private sector involved in the technology transfer to increase their role.

2. Capability Analysis:

Drawing upon accepted social science research analytical tools, analyze the capabilities of the key organizations involved in the technology development, transfer and utilization interface. The purpose of this study is to determine how best to enhance the relative strengths of the key organizations involved.

3. Trace Technology Flow:

This study involves tracing the development, approval, replication, transfer and utilization of specific technical innovations. The study will trace the introduction of

innovations related to seed varieties, chemicals, and cultural practices. The purpose of this study is to identify obstacles in the diffusion system which should be addressed.

4. Identify Appropriate Linkage Mechanisms:

This study will focus on identifying specific activities where meaningful interventions can be made to improve the technology transfer system. Crucial elements are linkage mechanisms which make the various components, such as research and extension, and organizations in the public and private sectors better interact. Linkage mechanisms are often overlooked or are not recognized as such (i.e. training) or they are not tailor made for the specific component (i.e. market research, production, wholesaling, retailing). Attention will be placed on linkages at the local level to identify appropriate technology through communication media, extension field staff, and other relevant mechanisms.

5. Develop a Performance Monitoring System: Preliminary work has begun by AERDRI and universities on designing a management information system where extension personnel would periodically provide data on their activities which could be analyzed at the governorate, program and central levels. The purpose of this is to provide an ongoing means to monitor progress and allow program modification.

6. Analyse Various Cost Recovery Mechanisms: This study will focus on identifying various cost recovery on cost sharing interventions or areas where interventions may be introduced in the technology transfer program. Particular attention will be focused on analysing the feasibility of various cost sharing mechanisms such as direct payment for services, sur-changes for specific commodities and taxes assessed to product sales.

APPNDIXD, JAN 21, 1988

Appendix 5

## SCOPES OF WORK FOR LONG-TERM TA

APPNDIXD, JAN 21, 1988

Appendix 5

## SCOPES OF WORK FOR LONG-TERM TA

The ARC, in collaboration with the MOA and USAID/Cairo, will select the long term personnel.

The Contractor will serve as coordinator for long as well as short term personnel. Experience in innovative non-traditional agriculture extension programs will provide the basic selection criteria for both long and short term personnel.

All long term personnel are expected to possess the following general qualifications and experiences;

a. Broad skills and experience in system organization and program management in their professional fields.

b. A strong technical background is important, but all personnel should have practical experience in applied technology transfer training, and managing large programs or projects.

c. Proven ability to work with many individuals and types of institutions; with management and technicians; and in the office and field is essential.

d. Work experience in Arab country is preferred.

Chief of Party/Technology Transfer Specialist, This is the component administrator responsible to the contractor home office, to the ARC, and to USAID for: short and long term TA; budget;

APPNDIXD, JAN 21, 1988

procurement; planning; reporting; coordinating; and monitoring the project activities. The Chief-of-Party (COP) is responsible for ensuring that all activities conform to the contract, work plan, and USAID and GOE statutes and regulations. This person will work closely with the Component Director.

The COP will assist the Component Director in establishing an efficient central administrative and financial management system for this component. Previous experience in agricultural extension, and commercial farming or agri-related industries is highly desirable. The COP should possess a strong academic background and numerous successful consultancies in organizational development; and/or experience as a senior manager for an agricultural firm. The use of short-term TA by the COP and the ARC Director to conduct some of the management functions listed above is expected.

Technology Transfer Specialist Advisors: These two individuals will assist with extension field operations. Their primary focus will be on the implementation of governorate technology transfer plans and non public technology transfer grants. Collectively, they should have experience with extension training programs, with mass media use in extension programs, and with monitoring and evaluation procedures and methodology.

Appendix 6

## SELECTED REFERENCES

Doc. No. REFRENSK, Jan. 9, 88

## REFERENCES


AID Cable: "AID Support for Agricultural Extension" Cable from the Administrator. June 1985.

AID: National Agricultural Production Project (NAPP) Design Paper, 1985.

"Annual Situation Report: Egypt" U.S. Department of Agriculture, Foreign Agricultural Service, March 4, 1987.

"Arab Republic of Egypt: Second Agricultural Development Project." Annex 3, 1983.

Britan, Gerald M.: "Innovative Approaches to Agricultural Education: An overview of AID Experience" (Draft), May, 1987.

Egyptian Major Cereals Improvement Project (EMCIP) Final Report, January 1980-January 1987.

Gollehon, Ronnie: "Small Farmer Production Project (SFPP) in Egypt" ACDI experience, 1985.

Johnson, et.al.: The Agricultural Technology System of Taiwan, INTERPAKS Country Brief, April, 1987.

"Implementation of a Strengthened Agricultural Extension Program in Egypt", U.S. Extension Study Team, April, 1982.

"Increasing Agricultural Production Through More Effective Use of Technology," U.S. Extension Study Team, MOA/ARE/USAID, November, 1981.

"Increasing Egyptian Agricultural Production through Strengthened Research and Extension Programs", MOA/USAID/World Bank/IADS, 1984.

"Mechanization Extension in Egyptian Agriculture" working paper, April 1983

National Agricultural Production Project (NARP) Project Paper Design, 1985

"National Agricultural Support Concept Paper", n.d.

National Agricultural Research Project (NARP) Project Paper, 1985.

"National Agriculture Research Project News", NARP Newsletter, May 1987.

"A Prototype Extension Service Pilot for Egypt", 1985.

Pease, Michael: "Promoting Improved Research and Extension Services in the Ministry of Agriculture", Egypt Agricultural Sector Loan Appraisal Mission, June, 1987.


Doc. No. REFRENSK, Jan. 9, 88

Pease, Michael: "The Fundamentals for Intensified Agricultural Extension in Egypt", June, 1987.

Pease, Michael: "Some Informal Reactions to the Recommendations of the Agriculture Extension Group", July 1, 1987

"Rural Development and Effective Extension Strategies: Farmers and Officials Views", Egypt Water Use and Management Project (EWUP) Technical Report No. 19, December, 1982.

Sallam, Dr. Mohamed Shafie: "Experience of Egypt Water Use and Management Project (EWUP) with Water Users' Associations", June, 1987.

Shehata, A.H. "The Role of the Agricultural Research Center in Attaining the Objectives of the Contemplated Agricultural Development."

"Strategies for Accelerating Agricultural Development: A Report of the Presidential Mission on Agricultural Development in Egypt", MOA/USAID/IADS/USDA, July 1982.

"Supporting Agricultural Systems" USAID Project Identification Document, 1983.

Swanson, Burton E.: "Analyzing Agricultural Technology Systems: A Research Report", INTERPAKS, Office of International Agriculture, University of Illinois at Urbana-Champaign.

Woods, John L.: "Jordan's Agricultural Technology System", INTERPAKS Country Brief, April, 1987.

**Doc. No. REFRENSK, Jan. 9, 88**

Appendix G

**APPNDIXG, 21/01/88**

There are a large number of diverse entities which are in contact with Egypt's farmers. The entities vary greatly in size, organizational purpose, target audience, and mmunity Groups/Societies

This includes Community Development Associations (estimated number is _____), Rural Clubs (estimated _____), (FILL IN NAMES & OTHER INFORMATION INCLUDING POTENTIAL FOR TECHNOLOGY TRANSFER)

3. Cooperatives

(THESE ARE NON-PBDAC---TYPES, NUMBERS, POTENTIAL FOR TECHNOLOGY TRANSFER, ETC)

4. Private Voluntary Organizations (PVOs)

It is estimated that approximately 14,000 indigenous and dozens of international PVOs operate in the rural areas of Egypt. Examples of indigenous PVOs include: Sakkara CDA in Giza Governorate with training program for rural women; Kom Ombo CDA, Aswan Governorate with beekeeping and rabbit programs. Examples of international PVOs include: CRS agricultural mechanism project; SAVE rural development in El Menya; CARE high Dam Lake Integrated Basic Services. The PVO programs tend to focus on specific rural development activities and cover small geographic areas, but are usually very successful in their linkages with rural people and, therefore, an important intermediary group.

5. Mass Media

Egyptian radio is government controlled. With the recent establishment of six regional stations, there is now a total of 36 domestic stations: 16 shortwave and 18 medium wave throughout the country, as well as two FM that, with repeaters, cover Cairo, Alexandria, Ismailia, Minia, Luxor, and Aswan. Domestic transmission is 200 hours daily. There are 45 million estimated receivers and on estimated domestic adult audience of 35 million. Radio Cairo's shortwave external services transmit 52 hours daily in 31 languages.

Television

Egyptian television is government controlled, but subsidized by direct commercial advertising. There are three channels, all Cairo-based, 2 providing national coverage, transmitting 218 hours weekly in toto. There are an estimated 3 million TV receiver sets: 13 million. With an estimated 35 viewers (2-3 viewers per set; 10-13 million viewers in prime-tiem audience).

Press

Egypt's press has been nationalized since 1960. Five major publishing houses control most dailies and periodicals. The three major Arabic dailies are Al-Ahram, Al-Akhbar, and Al-Gomhouriya. The minor afternoon daily is Al-Messa. There are two French-language dailies, one privately owned, and one English daily (the Egyptian Gazette); eight general interest weekly magazines; and several biweeklies and monthlies. The ruling National Democratic Party publishes the weekly newspaper Mayo; while the opposition right-of-center New Wafd Party publishes Al-Wafd, which has appeared daily since March 1987. There are five other opposition party papers, all weeklies:

the moderate-rightist Liberal Party paper Al-Ahram; the Sociolist Labor Party's Al-Shaab; the leftist National Progressive Unionist Grouping Party's Al-Ahali; Al-Ummah, issued by the religious party of the same name, appearing irregularly; and Sawt-El-Arab, a left-wing Nasserist weekly, that began publication in 1986.

Motion Pictures

Egypt has about 180 35mm theaters of which more than 120 are located in Cairo and Alexandria. The major cinemas are owned by state organizations, while smaller ones are privately owned. Estimated total annual attendance is 70 million. About 50 percent of all new films are imported, with U.S. films accounting for two-thirds of the foreign film imports. Egypt produces 40-45 feature films annually, most of which are financed by the private sector. Egyptian television began producing feature films at the end of 1983 for release in cinemas, and a new TV department for film production was inaugurated.

Video Clubs

Approximately 200 video cassette outlets in Cairo alone, all privately owned. No estimate had been made of the number outside Cairo, but outlets exist in practically all towns and cities, and the number is growing. Most of the films available are produced in Egypt, the United States, India, and the Far East.

Mass Culture

To compensate for lack of cultural opportunities in small towns and villages, the Ministry of Culture has established cultural centers and cultural caravans to provide people with free theatrical and film shows, lectures, exhibits, and books.

The state Information Service, under the Ministry of Information, maintains fifty information centers throughout the country which organize local cultural, informational, and educational programs.

Theater

The Egyptian Government sponsors several troupes including folklore dance troupes, puppet shows and a national circus. Private troupes are active, and have a larger audience. There are a few privately-owned theaters, but most are still government-owned; these, however, are frequently rented out for private productions. Ticket prices are high by local standards. Theater is the art form where political criticism is most likely to be expressed.

6. Commercial Companies

(INCLUDES MULTI-NATIONALS-EXAMPLES- ON DOWN TO VILLAGE RETAILERS. IN SOME COMMODITY GROUPS SUCH AS POULTRY AND HORTICULTURE PRIVATE SECTOR IS STRONG AND COULD BE VERY IMPORTANT CHANNEL FOR REACHING FARMERS).

7. Professional Associations (Syndicate)

(EXAMPLES, EXPLANATION OF SYNDICATE, WHERE OPERATE, NUMBERS, ROLE & POTENTIAL FOR TECHNOLOGY TRANSFER)

8. Educational Institutions

(# UNIVERSITIES & WHAT DO & COULD DO IN TECHNOLOGY, PRIMARY & SECONDARY SCHOOLS TEACHING AGRICULTURE & RELATED SUBJECTS, OTHER SCHOOLS SUCH AS VOCATIONAL/TECHNICAL, COMMUNITY COLLEGES, AMERICAN UNIVERSITY IN CAIRO, ETC)

9. NON-MOA GOE Agencies

(IRRIGATION, SOCIAL AFFAIRS, ETC .... WHAT OUTREACH

ACTIVITIES WHICH REACH FARMERS DO THEY HAVE, TYPES OF ACTIVITIES, POTENTIAL FOR TECHNOLOGY TRANSFER, ETC)

10. MOA Units (other than ARC and Public Extension Service) (PBDAC, HORTICULTURE, VETERINARY, PLANT PROTECTION, ETC---UNITS WHICH HAVE STAFF-EXTENSION AND NON-EXTENSION) WORKING AT THE FIELD LEVEL WHO ARE IN CONTACT WITH FARMERS, POTENTIAL FOR TECHNOLOGY TRANSFER, ETC)

Appendix 7

# OVERVIEW OF NON-PUBLIC EXTENSION SERVICE AGENCIES

**APPNDIX7. DOC 1/27/88**

## Overview of Non-Public Extension Service Agencies

There is a large number of diverse entities which are in contact with Egypt's farmers. The entities vary greatly in size, organizational purpose, target audience, and economic and staff resources. These entities fall into the following categories: private non-profit, private commercial sector, mass media, educational institutes, and governmental units.

### Private Non-Profit Entities

Private Voluntary Organizations (PVOs): Approximately 14,000 indigenous and dozens of international PVOs operate in the rural areas of Egypt. Many working in the rural areas are involved with agriculture, silk production, rabbit production and rural youth and women programs. The dozen or so international PVOs are involved with agricultural mechanization, integrated rural development, and pilot agricultural television programs. Agricultural Cooperative Development, International (ACDI) has just received a grant totaling LE 1.8 million to produce 22 TV spots on new agricultural technologies. Catholic Relief Services is working with an agricultural mechanization project; Save the Children is working with a rural development project in El Menya; and CARE sponsors the high Dam Lake Integrated Basic Services project.

Local Community/Farmers/Social Groups: Producer syndicates, credit institutes in addition to PBDAC, and community groups with target audiences, e.g. youth and women,

are also involved with technology transfer activities at the local level. Examples of Community Development Associations include Sakkara CDA in Giza Governorate which is working with training programs for rural women, and Kom Ombo CDA in Aswan Governorate working with beekeeping and rabbit programs.

PVO and local community programs tend to focus on specific rural development activities and cover small geographic areas, but are usually very successful in their linkages with rural people and, therefore, an important intermediary group.

## Private Sector Commercial Companies

Private Sector Commercial Companies: The "Egyptian Investment and Business Directory" lists approximately 200 private sector firms involved in agriculture. The majority of these firms are in poultry or horticulture. Many of these firms have staff working at the field level in contact with farmers. Examples of commercial firms involved in information delivery include Pioneer Seed's annual field days, Ciba-Geigy's sales staff, and Kabota's advertising campaigns.

## Mass Media

Radio: Egyptian radio is government controlled. With the recent establishment of six regional stations, there is now a total of 36 domestic stations: 16 shortwave and 18 medium wave throughout the country, as well as two FM that, with repeaters, cover Cairo, Alexandria, Ismailia, Minia, Luxor, and Aswan. Domestic transmission is 200 hours daily. There are 45 million estimated receivers and an estimated domestic adult audience of 35 million. Radio Cairo's shortwave external services transmit 52 hours daily in 31 languages.

Television: Egyptian television is government controlled,

but subsidized by direct commercial advertising. There are three channels, all Cairo-based, 2 providing national coverage, transmitting 218 hours weekly in toto. There are an estimated 3 million TV receiver sets: 13 million. With an estimated 35 viewers (2-3 viewers per set; 10-13 million viewers in prime-time audience).

Press: Egypt's press has been nationalized since 1960. Five major publishing houses control must dailies and periodicals. The three major Arabic dailies are Al-Ahram, Al-Akhbar, and Al-Gomhouriya. The minor afternoon daily in Al-Messa. There are two French-language dailies, one privately owned, and one English daily (the Egyptian Gazette); eight general interest weekly magazines; and several biweeklies and monthlies. The ruling National Democratic Party publishes the weekly newspaper Mayo; while the opposition right-of-center new Wafd Party publishes Al-Wafd, which has appeared daily since March, 1987. There are five other opposition party papers, all weeklies: the moderate-rightist Liberal Party paper Al-Ahram; the Socialist Labor Party's Al-Shaab; the leftist National Progressive Unionist Grouping Party's Al-Ahali; Al-Ummah, issued by the religious party of the same name, appearing irregularly; and Sawt-El-Arab, a left-wing Nasserist weekly, that began publication in 1986.

Motion Pictures: Egypt has about 180 35mm theaters of which more than 120 are located in Cairo and Alexandria. The major cinemas are owned by state organizations, while smaller ones are privately owned. Estimated total annual attendance is 70 million. About 50 percent of all new films are imported, with U.S. films accounting for two-thirds of the foreign film imports. Egypt produces 40-45 feature films annually, most of which are financed by the private sector. Egyptian television

began producing feature films at the end of 1983 for release in cinemas, and a new TV department for film production was inaugurated.

Video Clubs: Approximately 200 video cassette outlets in Cairo alone, all privately owned. No estimate had been made of the number outside Cairo, but outlets exist in practically all towns and cities, and the number is growing. Most of the films available are produced in Egypt, the United States, India, and the Far East.

Mass Culture: To compensate for lack of cultural opportunities in small towns and villages, the Ministry of Culture has established cultural centers and cultural caravans to provide people with free theatrical and film shows, lectures, exhibits, and books. The state Information Service, under the Ministry of Information, maintains fifty information centers throughout the country which organize local cultural, informational, and educational programs.

Theater: The Egyptian Government sponsors several troupes including folklore dance troupes, puppet shows and a national circus. Private troupes are active, and have a larger audience. There are a few privately-owned theaters, but most are still government-owned; these, however, are frequently rented out for private productions. Ticket prices are high by local standards. Theater is the art form where political criticism is most likely to be expressed.

## Educational Institutes

Faculties of Agriculture: Egypt has 14 university facilities of Agriculture, several of which have their own

small extension programs. These extension programs are locally based and generally deal with a limited number of commodities, e.g. horticulture or small scale protein. Many university professors also coordinate with ARC as SMSs in National Production Campaigns.

A small amount of outreach activities are performed by the handful of vocational schools in the country.

## Government Units

Other Agencies: In addition to the public extension service, other GOE agencies which are represented at the local level include PBDAC's 20,000 field staff, Public Works and Water Resources (PWWR's) 12,800 field staff, 1,000 field staff for veterinary services, 800 animal production staff, 1,000 horticulture staff and 40 aquaculture extension staff. Some of these field staff are currently performing extension services and all are in contact with farmers. Activities include outreach activities performed in conjunction with production campaigns, work in special seasonal areas (cotton boll weevil control, hoof and mouth vaccination) and routine coordination activities such as delivery of water and other agricultural inputs.

Appendix 8

# DRAFT FIRST YEAR IN-COUTNRY TRAINING PLAN

TABLE OF CONTENTS

INTRODUCTION

PURPOSE

OBJECTIVES

TRAINING BUDGET

PROCEDURES

FOLLOW-UP, MONITORING, REPORTING

DRAFT FIRST YEAR TRAINING PROGRAM

IN-COUNTRY TRAINING BUDGET

# DRAFT FIRST YEAR IN-COUNTRY TRAINING PLAN
## FY 1988

### INTRODUCTION

Because of the nature of the design of this component, a large number of consultants have reviewed the needs and estimated types of both in-country and off-shore training. As necessary, assessments may be performed to adjust the estimated levels.

The following pages are presented as a framework for the first year's in-country training and will be refined after the governorate plans are developed.

### PURPOSE

In-country training programs are designed to improve the knowledge, attitudes and skills of agricultural professionals, government officials, non-government staff, and farmers to plan, manage and implement programs in the technology transfer system.

In-country training will provide both formal and informal training in Egypt for NARP participants from all levels of the agricultural technology transfer system, private sector or farm community. Program managers, researchers, technology transfer professionals, technicians and support staff will receive hands-on practical training in management, technology transfer, and technical training to help improve their job performance and implementation of improved technology transfer programs. The farm community will be able to increase their agricultural production through learning the application of new technical practices.

OBJECTIVES

The objectives are to provide training in the three major areas of technology transfer management, technical training and language training.

1. Management Training

The objectives of the program are to:

a. Train executive, middle and supervisory level managers within the public and non-public technology transfer system to develop methods to utilize the human, financial and physical resources within the agricultural system;

b. Train researchers and key personnel in the design and operation of technology transfer systems and,

c. Train subject matter specialists, extension specialists (public and non-public) and farmers to develop a system of technology transfer and provide a linkage from the researchers to the farmer through development and implementation of a wide variety of feedback mechanisms.

2. Technical Training

This training will be hands-on-training for all levels of staff such as researchers, technicians, support staff, skilled laborers, clerks, unskilled laborers and individuals in the private sector. The objectives are to train designated personnel on:

a. Specialized knowledge areas or techniques required within the individual, organizations, unit and departments.

b. Mass media techniques;

c. Concepts and use of computers in office or research applications;

d. Secretarial and office procedures;

e. Financial principles, procedures and application;

f. Basic tools, procedures and technology in use of information systems and libraries for research;

g. Operation, maintenance and repair of audio/video/reproduction equipment, mass media equipment, machinery, buildings, and computers.

3. <u>English Language Training</u>

The objectives of the programs are to have designated middle level and high level staff:

a. Improve their English skills to obtain adequate TOEFL and ALIGU scores necessary for academic or short term training in the U.S.

b Improve their English skills to help on-the-job performance for technology transfer systems.

The training services will be contracted mostly from individuals, organizations or government training centers within Egypt. Agricultural technical and management training centers throughout Egypt will be utilized. Approximately a dozen MOA training centers exist. Other facilities which could be used are the National Research Center, Egyptian Universities, American University in Cairo, etc.

In some instances the trainers will be contracted from the United States or International Agricultural Research Centers.

When appropriate, training will take place in sessions with participates from other components of NARP.

**TRAINING BUDGET**

The training budget gives the total estimated costs for the LOP years and an estimated cost for the first year of implementation. The costs for this period will be lower than other years because the governorate plans and non-public grants activities for this component will not yet be fully operational.

The Allowable Training Costs include:

1. Lectures and instructors, supervisors, inspectors and program assistant fees;

2. Equipment rental;

3. Fuel, oil and lubricants;

4. Audio-visual aids and equipment and operator rental;

5. Room and board;

6. Transportation;

7. Expendable training materials;

8. Incidental living expenses;

9. Training Center fees;

10. Administrative expenses; and,

11. Miscellaneous.

Payment of lecture and instructor fees, transportation fees for trainees, training center fees, and supplemental fees will all fall under guidelines previously established under the NARP project.

**PROCEDURES**

1. Institutes, department directors, governorates and non-public organizations will be asked to implement in-country training. This involves writing training objectives, determining program content, scheduling, determining budgets, reporting and evaluation for those activities which they requested.

2. Technical assistance will be made available during this stage as determined appropriate.

3. The component Administrative Unit staff will work with directors in scheduling, organizing and further development of the scheduled training activities.

4. Monitoring and evaluation procedures will be coordinated with the USAID Training office.

5. A computer catalog system will be devised in early in the first year of implementation. This system can be available to all members of the technology transfer system and will inform the user of the topic of training, type of training, target audience, duration, location and level of training. This catalog will be constantly updated for the duration of the project.

IN-COUNTRY TRAINING FOLLOW-UP, MONITORING AND REPORTING

Follow-up is necessary to determine the effectiveness of activities. Computers will be used to implement a detailed system of evaluation, monitoring, and reporting in major areas of:

1. Improvement or change in knowledge and skill of the participant;

2. Analysis of contribution of training activities in relation to project outputs and improvements in organization;

3. Analysis of cost in relation to training activity; and,

4. Analysis of personnel, methods and training center.

Each training activity will state the need for the training, an outline of the objectives, content and expected benefits for trainee and the organization. A separate evaluation sheet will be devised for each activity which will be aimed at measuring improvement or change in the individual or program.

A system will be developed to track participants and related costs.

The analysis of activities as related to project outputs will be submitted to both the Director General and USAID to report the relationship of training activities to project outputs.

Other evaluation methods will be developed as needed.

ANNUAL IN-COUNTRY TRAINING FY 1988 - 1989

| Code | | | FY 1988 - 1989 | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| | EXECUTIVE MANAGEMENT | | | | | Courses will be given to senior governorate level managers to: |
| | Managerial Skills & Leadership | CARE/CAARE/AERDRI | 1 | 10 | 6 days | Determine roles and develop planning and organizational skills needed to improve research management. |
| | Time Management & Delegation | CARE/CAARE/AERDRI | 1 | 5 | 3 days | Analyze methods and time needed to accomplish the tasks with clear delegation of responsibilities among staff. |
| | Problem Solving and Decision Making | CARE/CAARE/AERDRI | 1 | 12 | 3 days | Develop and practice methods of problem solving and team building. |
| | Evaluation Methods and Skills | CARE/CAARE/AERDRI | 1 | 5 | 3 days | Learn to assess programs and provide feedback to communicate program successes or improvement needed for future programs. Learn principles of negotiation. |
| | MIDDLE MANAGEMENT | | | | | Middle governorate level managers will be trained to: |
| | Management Planning | CARE/CAARE/AERDRI | 2 | 15 | 5 days | Understand principles of organization and development and develop plans for technology transfer priorities. |
| | Financial Management | CARE/CAARE/AERDRI | 2 | 15 | 5 days | Learn to develop financial plans and management schemes according to priorities. |
| | Mgmt-Project Cycling | CARE/CAARE/AERDRI | 2 | 15 | 5 days | Develop annual project plans to implement research priorities. |
| | Organizational Management | CARE/CAARE/AERDRI | 2 | 15 | 5 days | Explore specific problems to practice problem solving and team building techniques within a group situation. |
| | BEGINNING MANAGEMENT | | | | | Beginning governorate level managers will: |
| | Basic Management/beginning | CARE/CAARE/AERDRI | 2 | 20 | 10 days | Explore and understand basic principles of organization and development of technology transfer programs. |
| | Basic Mgmt./advanced | CARE/CAARE/AERDRI | 2 | 20 | 5 days | Explore principles of leadership and apply selected project management system tools, techniques, and team processes. |
| | ORIENTATION TO AG. | | | | | |
| | Preservice for the employees | CARE/CAARE/AERDRI | 2 | 20 | 5 days | Orientation for new employment at ARC. |
| | Agricultural Orientation | CARE/CAARE/AERDRI | 6 | 20 | 1 day | Create awareness for new agricultural graduates about research and technology transfer systems in agricultural research. |
| | FINANCIAL MANAGEMENT | | | | | |
| | Accounting | CARE/CAARE/AERDRI | 1 | 15 | 3 weeks | Learn new procedures implemented in system. |
| | Designing Budgets | CARE/CAARE/AERDRI | 1 | 12 | 3 weeks | Improve management and learn new principles & procedures. |
| | Purchasing & Inventory - Beg. | CARE/CAARE | 1 | 13 | 3 weeks | Learn beginning procedures & rules of inventory management. |
| | Purchasing & Inventory - Adv. | CARE/CAARE | 1 | 15 | 1 week | Learn improved or new practices & procedures in inventory MGT. |
| | Personnel Management | CARE/CAARE/AERDRI | 1 | 12 | 2 weeks | Improve management skills and learn new updated methods for personnel management. |

ANNUAL IN-COUNTRY TRAINING FY 1988 - 1989

| Code | | | FY 1988 - 1989 | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| | Financial Management-Salaries | CASE/CAAES/AERDRI | 1 | 12 | 2 weeks | Update skills & learn new concepts & procedures of management. |
| | COMPUTERS | | | | | |
| | Computer Literacy-Beginning | CASE/CAAES/AERDRI | 3 | 15 | 2 weeks | Learn basic concepts and gain hand on experience for office or research applications. |
| | Computer Literacy-Advanced | CASE/CAAES/AERDRI | 2 | 15 | 4 weeks | Continue second course to advance concepts for practical use. |
| | Computer Word Processing | CASE/CAAES/AERDRI | 5 | 8 | 4 weeks | Learn how to format, process, edit and transfer data. |
| | Computer-Programming | CASE/CAAES/AERDRI | 3 | 8 | 4 weeks | Hands on training on software appropriate for trainee's needs. |
| | Computer Analysis & Data Systems | CASE/CAAES/AERDRI | 2 | 15 | 4 weeks | Learn computer software techniques necessary to analyse data. |
| | Computer Modeling | CASE/CAAES/AERDRI | 1 | 5 | 8 weeks | Develop techniques to make stimualation models of plant pests, diseases, weeds, or pesticides in the environment. |
| | Microcomputer & Telecommunications | CASE/CAAES/AERDRI | 2 | 10 | 4 weeks | Train on telecommunications hardware & installment of software |
| | Computer Equip-Basic Maint. | CASE/CAAES/AERDRI | 2 | 5 | 6 weeks | Learn routine maintenance and basic repair. |
| | SECRETARIAL SKILLS | | | | | |
| | Typing-English & Arabic | CASE/CAAES/AERDRI | 5 | 10 | 40 days | Learn and practice basic touch typing. |
| | Secretarial | CASE/CAAES/AERDRI | 2 | 8 | 10 days | Learn to answer phones and apply general office procedures. |
| | Filing | CASE/CAAES/AERDRI | 2 | 8 | 10 days | Learn basic filing systems and procedures. |
| | RESEARCH DEVELOPMENT | | | | | Research staff will participate in group training to: |
| | Feasibility & Proj. Eval. Studies | CASE/CAAES/AERDRI | 3 | 15 | 5 days | Design & implement financial, economical, & social analysis. |
| | Research Planning | CASE/CAAES/AERDRI | 2 | 25 | 5 days | Determine research objectives and design implementation plans. |
| | Research Management | CASE/CAAES/AERDRI | 1 | 25 | 5 days | Learn to develop objectives and management plans for current research. |
| | Research Design | CASE/CAAES/AERDRI | 1 | 25 | 5 days | Develop laboratory, field & statistical designs for research activities. |
| | Experimental Design & Planning | CASE/AERDRI | 2 | 25 | 10 days | Learn to select proper designs, ANOV and plan experiments. |
| | STATISTICS / ECONOMICS | | | | | |
| | General Statistics | CAAES | 1 | 10 | 10 days | Review basic concepts and some new techniques. |
| | Sampling Statistics | CAAES | 1 | 10 | 10 days | Review basic concepts and some new techniques. Emphasis will be placed on learning to use selected computer programs. |
| | Social Research | CASE/AERDRI | 1 | 10 | 10 days | Learn & review concepts methods of social analysis & research. |
| | Extension Methods Evaluation | CASE/CAAES/AERDRI | 1 | 10 | 10 days | Learn to develop statistics appropriate for extension eval. |
| | ON-FARM TRIALS | | | | | |
| | On-Farm Trials Management: | CAAES | 18 | 40 | 10 days | Researchers and management staff will be involved in |

ANNUAL IN-COUNTRY TRAINING FY 1988 - 1989

| Code | | | FY 1988 - 1989 | | | |
|---|---|---|---|---|---|---|
| | | | | | | training sessions with on-farm specialists to define problems and research plans for the current year. |
| | On-Farm Trials Practicum | CAAES | Contin. | 10 | 40 days | Researchers will work with on-farm specialists to practice and evaluate effectiveness of planned procedures. |
| | On-Farm Trials for Farmers | CAAES | Contin. | 60 | 2 days | Special sessions will be conducted with farmers to plan & implement on-farm trials research. |
| | TRAINER OF TRAINERS | | | | | |
| | Training of Trainers - General | CAAES | 2 | 20 | 4 weeks | General management seminar in training. |
| | Organization Development | | 1 | 20 | 12 weeks | Analyze, modify and practice new techniques being used for development. |
| | Trainer of Trainers Res. MGT. | CASE | 2 | 20 | 12 weeks | Develop and test a management system for trainers. |
| | INFORMATION SYSTEMS, LIBRARY & RESEARCH | | | | | |
| | Learning Literature Review | CASE/CAAES/AERDRI | 2 | 15 | 1 week | Learn the organization of techniques & protocols in using published literature and informational services. |
| | Library Reference Source & Services | CASE/CAAES/AERDRI | 1 | 25 | 8 weeks | Learn to use basic reference sources & scientific reference materials; conventional and electronic. |
| | Database Search Techniques | CASE/CAAES/AERDRI | 1 | 10 | 10 days | Use electronic databases & cost-effective search techniques (subject specific and/or medium-specific orientation. |
| | MANAGEMENT (Misc). | | | | | |
| | Mgmt. of Library Resources & Services | CAAES | 1 | 20 | 3 months | Learn management of scarce resources with best results like resource sharing, cooperative services, networking & case studies. |
| | R/E Station Management Training | CASE | 1 | 20 | 3 weeks | Learn effective operation and management of R/E stations. |
| | EXTENSION | | | | | |
| | Subject Matter Specialist | CASEC | Contin. | 20 | 10 days | Learn techniques to transfer new technology from the researcher to the extension worker and farmers. Test the linkage relationships. |
| | Local Leader Training | CASE | 1 | 14 | 1 week | Special training on extension techniques for farmers. |
| | EXTENSION TECHNIQUES | | | | | |
| | Training Methodology | CASE/CAAES | 4 | 20 | 1 week | Learn techniques to transfer new technologies from researcher to farmer. |
| | Rural Sociology | CASE/CAAES | 2 | 20 | 1 week | Learn how to build and sustain linkages with farmers. |
| | Rural Sociology II | CASE/CAAES | 2 | 20 | 4 days | Learn how to evaluate effectiveness of and improve |

ANNUAL IN-COUNTRY TRAINING FY 1988 - 1989

| Code | | RE | FY 1988 - 1989 | | | |
|---|---|---|---|---|---|---|
| | | | | | | researcher/farmer feedback mechanism. |
| | Rural Women | CASE/CAAES | 3 | 15 | 3 days | Learn to design and implement programs aimed at female farmers. |
| | Rural Youth | CASE/CAAES | 3 | 15 | 3 days | Learn to design & implement programs aimed at young farms. |
| | Rural Youth II | CASE/CAAES | 2 | 15 | 3 days | Learn how to evaluate effectiveness of & improve young farmer programs. |
| | Farming Systems | CASE/CAAES | 3 | 10 | 1 week | Research, extension, and management will work with on-farm specialist to define problem and develop solution for Egypt's farmers. |
| | Agricultural Communications | CASE/CAAES | 5 | 20 | 4 days | Learn basic communication theory. |
| | Cooperative Organizations | CASE/CAAES | 2 | 20 | 3 days | Learn effective techniques for dealing with groups. |
| | MASS MEDIA | | | | | |
| | Effective use of mass media | CASE/CAAES | 3 | 20 | 2 weeks | Learn dissemination & distribution techniques. |
| | Use of Audio Visual Equipment | CASE/CAAES | 4 | 15 | 4 days | Operate sound-slide projectors, film projectors, VCR of all types. Assemble and replace components, bulbs. |
| | Use of Reproduction Equipment | CASE/CAAES | 5 | 15 | 1 week | Operate & maintain reproduction equipment. Learn to order and maintain supplies. |
| | Print Media I | CASE/CAAES | 6 | 16 | 2 weeks | Basic layout and design techniques. |
| | Print Media II | CASE/CAAES | 3 | 20 | 3 days | Learn how to describe technical subjects to a non-technical audience. |
| | Visual Display Methods | CASE/CAAES | 4 | 20 | 3 days | Learn flip chart, bulletin board & bill board techniques. |
| | Equipment Maintenance | CASE/CAAES | 2 | 15 | 2 weeks | Learn basic daily maintenance & minor repair of A/V, reproduction, and printing equipment. |
| | LANGUAGE | | | | | |
| | English Language Training-Adv. | CASE/CAAES/AERDRI | 2 | 18 | 8 weeks | Learn English to advance to pre-TOEFL score of 196 |
| | English Language Training-Int. | CASE/CAAES/AERDRI | 5 | 18 | 8 weeks | Learn English to advance beyond ALIGU score of 150 |
| | English Language Training-Beb. | CASE/CAAES/AERDRI | 5 | 18 | 8 weeks | Learn basic English to advance beyond ALIGU Score of 106. |
| | English-Technical Reading Int. | CASE/CAAES/AERDRI | 2 | 15 | 1 week | Increase proficiency in understanding technical literature for own use and to assist others. |
| | English-Technical Writing Adv. | CASE/CAAES/AERDRI | 2 | 15 | 1 week | Write technical articles, abstracts & summaries acceptable for technical journals. |

**NATIONAL AGRICULTURAL RESEARCH PROJECT**
(263-0152)
AMENDMENT NO. 2

AGRICULTURAL TECHNOLOGY TRANSFER COMPONENT
COST ESTIMATE
($000)

PROJECTION OF EXPENDITURES BY FISCAL YEARS

| | FY89 | | FY90 | | FY91 | | FY92 | | FY93 | | FY94 | | TOTAL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | TOTAL |
| **TECHNICAL ASSISTANCE** | 861 | 132 | 876 | 72 | 876 | 72 | 696 | 72 | 516 | 72 | 471 | 72 | 4,296 | 492 | 4,788 |
| LONG TERM | 336 | 72 | 336 | 72 | 336 | 72 | 336 | 72 | 336 | 72 | 336 | 72 | 2,016 | 432 | 2,448 |
| SHORT TERM | 525 | 60 | 540 | 0 | 540 | 0 | 360 | 0 | 180 | 0 | 135 | 0 | 2,280 | 60 | 2,340 |
| **TRAINING** | 320 | 1,629 | 675 | 1,629 | 555 | 1,599 | 375 | 1,597 | 225 | 1,596 | 110 | 1,567 | 2,260 | 9,617 | 11,877 |
| LONG TERM | 210 | 0 | 510 | 0 | 390 | 0 | 210 | 0 | 60 | 0 | 0 | 0 | 1,380 | 0 | 1,380 |
| SHORT TERM | 110 | 1,629 | 165 | 1,629 | 165 | 1,599 | 165 | 1,597 | 165 | 1,596 | 110 | 1,567 | 880 | 9,617 | 10,497 |
| **COMMODITIES** | 2,052 | 1,124 | 5,957 | 1,124 | 1,212 | 110 | 0 | 110 | 0 | 110 | 0 | 110 | 9,221 | 2,688 | 11,909 |
| OFFICE EQUIP. / SUPPLIES | 0 | 1,124 | 220 | 1,124 | 587 | 110 | 0 | 110 | 0 | 110 | 0 | 110 | 807 | 2,688 | 3,495 |
| VEHICLES (VANS & MOTORCYCLES) | 2,052 | 0 | 3,547 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5,599 | 0 | 5,599 |
| MEDIA PRODUCTION EQUIP. | 0 | 0 | 2,190 | 0 | 625 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2,815 | 0 | 2,815 |
| **SERVICES** | 75 | 3,225 | 75 | 3,046 | 125 | 1,715 | 100 | 1,461 | 50 | 1,230 | 0 | 1,280 | 425 | 11,957 | 12,382 |
| DEMONISTRATION | 0 | 680 | 0 | 680 | 0 | 680 | 0 | 680 | 0 | 680 | 0 | 680 | 0 | 4,080 | 4,080 |
| TRAVEL | 0 | 500 | 0 | 375 | 0 | 250 | 0 | 125 | 0 | 0 | 0 | 0 | 0 | 1,250 | 1,250 |
| MAINTENANCE | 0 | 230 | 0 | 173 | 0 | 115 | 0 | 58 | 0 | 0 | 0 | 0 | 0 | 576 | 576 |
| PRINTING | 0 | 140 | 0 | 105 | 0 | 70 | 0 | 35 | 0 | 0 | 0 | 0 | 0 | 350 | 350 |
| MEDIA | 0 | 160 | 0 | 120 | 0 | 80 | 0 | 40 | 0 | 0 | 0 | 0 | 0 | 400 | 400 |
| ADMINISTRATION | 0 | 90 | 0 | 68 | 0 | 45 | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 226 | 226 |
| OFFICE RENOVATION | 0 | 1,000 | 0 | 1,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2,000 | 2,000 |
| TECH. TRANSFER GRANTS | 75 | 425 | 75 | 525 | 125 | 475 | 100 | 500 | 50 | 550 | 0 | 600 | 425 | 3,075 | 3,500 |
| **SUB-TOTAL** | 3,308 | 6,110 | 7,583 | 5,871 | 2,768 | 3,496 | 1,171 | 3,240 | 791 | 3,008 | 581 | 3,029 | 16,202 | 24,754 | 40,956 |
| CONTINGENCIES 5% | 165 | 306 | 379 | 294 | 138 | 175 | 59 | 162 | 40 | 150 | 29 | 151 | 810 | 1,238 | 2,048 |
| INFLATION | 165 | 672 | 777 | 1,029 | 436 | 732 | 252 | 942 | 219 | 1,139 | 198 | 1,434 | 2,047 | 5,948 | 7,996 |
| **TOTAL** | 3,639 | 7,088 | 8,739 | 7,193 | 3,343 | 4,403 | 1,482 | 4,344 | 1,049 | 4,297 | 808 | 4,614 | 19,060 | 31,940 | 51,000 |

**NATIONAL AGRICULTURAL RESEARCH PROJECT**
(263-0152)
AMENDMENT NO. 2

AGRICULTURAL TECHNOLOGY TRANSFER COMPONENT
TECHNICAL ASSISTANCE COST ESTIMATE
($000)

PROJECTION OF EXPENDITURES BY FISCAL YEARS

| SPECIALIZATION | NO. OF M.M. | COST PER MAN MONTH | | TOTAL | | FY89 | | FY90 | | FY91 | | FY92 | | FY93 | | FY94 | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | |
| **LONG TERM** | 144 | | | 2,016 | 432 | 336 | 72 | 336 | 72 | 336 | 72 | 336 | 72 | 336 | 72 | 336 | 72 | 2,448 |
| Extension Specialist (CID) | 72 | 14.0 | 3.0 | 1,008 | 216 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 1,224 |
| Extension Specialist (CID) | 72 | 14.0 | 3.0 | 1,008 | 216 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 168 | 36 | 1,224 |
| **SHORT TERM** | 182 | | | 2,280 | 60 | 525 | 60 | 540 | 0 | 540 | 0 | 360 | 0 | 180 | 0 | 135 | 0 | 2,340 |
| EXTENSION | | | | | | | | | | | | | | | | | | |
| Rural Sociology | 5 | 15.0 | 0.0 | 75 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 0 | 0 | 75 |
| Agricultural Education | 4 | 15.0 | 0.0 | 60 | 0 | 0 | 0 | 15 | 0 | 30 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 60 |
| Agricultural Communications | 5 | 15.0 | 0.0 | 75 | 0 | 30 | 0 | 30 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 75 |
| Adult Education | 3 | 15.0 | 0.0 | 45 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 45 |
| Rural Youth Organizations | 4 | 15.0 | 0.0 | 60 | 0 | 30 | 0 | 15 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 60 |
| Women's Development Program | 3 | 15.0 | 0.0 | 45 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 45 |
| Cooperative Organizations | 3 | 15.0 | 0.0 | 45 | 0 | 0 | 0 | 45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 45 |
| Training Methodolgy | 6 | 15.0 | 0.0 | 90 | 0 | 30 | 0 | 30 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 90 |
| Training Curriculum | 5 | 15.0 | 0.0 | 75 | 0 | 0 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 75 |
| Farm Management | 2 | 15.0 | 0.0 | 30 | 0 | 0 | 0 | 15 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| Farming Systems | 2 | 15.0 | 0.0 | 30 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| MASS MEDIA | | | | | | | | | | | | | | | | | | |
| A.V. Specialist | 9 | 15.0 | 0.0 | 135 | 0 | 0 | 0 | 30 | 0 | 30 | 0 | 30 | 0 | 30 | 0 | 15 | 0 | 135 |
| Advertizing | 3 | 15.0 | 0.0 | 45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 45 | 0 | 0 | 0 | 0 | 0 | 45 |
| Publication Layout | 6 | 15.0 | 0.0 | 90 | 0 | 0 | 0 | 0 | 0 | 45 | 0 | 45 | 0 | 0 | 0 | 0 | 0 | 90 |
| Print Media | 3 | 15.0 | 0.0 | 45 | 0 | 0 | 0 | 30 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 45 |
| SUPPORT | | | | | | | | | | | | | | | | | | |
| Management Analyst | 6 | 15.0 | 0.0 | 90 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 90 |
| Financial Management | 6 | 15.0 | 0.0 | 90 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 90 |
| Equipment Repairs & Maintanace | 4 | 15.0 | 0.0 | 60 | 0 | 0 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 0 | 0 | 60 |
| Computer Programing & Software | 6 | 15.0 | 0.0 | 90 | 0 | 0 | 0 | 15 | 0 | 15 | 0 | 30 | 0 | 15 | 0 | 15 | 0 | 90 |
| Commodity Procurement | 2 | 15.0 | 0.0 | 30 | 0 | 15 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| Agricultural Economics | 2 | 15.0 | 0.0 | 30 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 30 |
| Privatization | 2 | 15.0 | 0.0 | 30 | 0 | 0 | 0 | 15 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| Invited Papers / Speakers | 4 | 15.0 | 0.0 | 60 | 0 | 0 | 0 | 0 | 0 | 60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 60 |
| Inventory Specialist | 3 | 15.0 | 0.0 | 45 | 0 | 0 | 0 | 45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 45 |

**NATIONAL AGRICULTURAL RESEARCH PROJECT**
(263-0152)
AMENDMENT NO. 2

AGRICULTURAL TECHNOLOGY TRANSFER COMPONENT
TECHNICAL ASSISTANCE COST ESTIMATE
($000)

PROJECTION OF EXPENDITURES BY FISCAL YEARS

| SPECIALIZATION | NO. OF M.M. | COST PER MAN MONTH | | TOTAL | | FY89 | | FY90 | | FY91 | | FY92 | | FY93 | | FY94 | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | |
| MONITORING | | | | | | | | | | | | | | | | | | |
| Program Design | 7 | 15.0 | 0.0 | 105 | 0 | 15 | 0 | 30 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 105 |
| Methodology | 5 | 15.0 | 0.0 | 75 | 0 | 30 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 75 |
| Program Analysis | 6 | 15.0 | 0.0 | 90 | 0 | 0 | 0 | 15 | 0 | 30 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 90 |
| Survey Statistician | 3 | 15.0 | 0.0 | 45 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 45 |
| GOVERNORATE PLANNING PROG. | | | | | | | | | | | | | | | | | | |
| US Extension Programmers | 15 | 15.0 | 0.0 | 225 | 0 | 30 | 0 | 45 | 0 | 45 | 0 | 45 | 0 | 30 | 0 | 30 | 0 | 225 |
| Egyptian Specialists | 30 | 0.0 | 2.0 | 0 | 60 | 0 | 60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 60 |
| PRE-IMPLEMENTATION | 18 | 15.0 | 0.0 | 270 | 0 | 270 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 270 |
| **TOTAL** | 326 | | | 4,296 | 492 | 861 | 132 | 876 | 72 | 876 | 72 | 696 | 72 | 516 | 72 | 471 | 72 | 4,788 |

**NATIONAL AGRICULTURAL RESEARCH PROJECT**
(263-0152)
AMENDMENT NO. 2

AGRICULTURAL TECHNOLOGY TRANSFER COMPONENT
TRAINING COST ESTIMATE
($000)

PROJECTION OF EXPENDITURES BY FISCAL YEARS

| ILLUSTRATIVE TRAINING PROGRAM | No. OF PART. | TRG. MO.(T.M) | COST PER UNIT | | TOTAL | | FY89 | | FY90 | | FY91 | | FY92 | | FY93 | | FY94 | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | |
| **LONG TERM TRAINING** | 19 | 552 | | | 1,380 | 0 | 210 | 0 | 510 | 0 | 390 | 0 | 210 | 0 | 60 | 0 | 0 | 0 | 1,380 |
| *MASTERS STUDIES* | | | | | | | | | | | | | | | | | | | |
| EXTENSION METHODOLOGY | 2 | 56 | 2.5 | 0.0 | 140 | 0 | 60 | 0 | 60 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 140 |
| RESEARCH DISSEMINATION | 1 | 28 | 2.5 | 0.0 | 70 | 0 | 30 | 0 | 30 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 70 |
| AGRICULTURAL COMMUNICATIONS | 1 | 28 | 2.5 | 0.0 | 70 | 0 | 0 | 0 | 30 | 0 | 30 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 70 |
| RESEARCH PACKAGING | 1 | 28 | 2.5 | 0.0 | 70 | 0 | 0 | 0 | 30 | 0 | 30 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 70 |
| AGRICULTURAL EXTENSION | 2 | 56 | 2.5 | 0.0 | 140 | 0 | 0 | 0 | 60 | 0 | 60 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 140 |
| AGRICULTURAL EDUCATION | 1 | 28 | 2.5 | 0.0 | 70 | 0 | 0 | 0 | 30 | 0 | 30 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 70 |
| ADULT EDUCATION | 1 | 28 | 2.5 | 0.0 | 70 | 0 | 0 | 0 | 30 | 0 | 30 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 70 |
| *DOCTORAL STUDIES* | 5 | 240 | 2.5 | 0.0 | 600 | 0 | 90 | 0 | 150 | 0 | 150 | 0 | 150 | 0 | 60 | 0 | 0 | 0 | 600 |
| *POST DOCTORAL* | | | | | | | | | | | | | | | | | | | |
| EDUCATION PLANNING & DEVELOPMENT | 1 | 12 | 2.5 | 0.0 | 30 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| COMMUNICATIONS PRODUCTION | 1 | 12 | 2.5 | 0.0 | 30 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| COMMUNICATION DISSEMINATION | 1 | 12 | 2.5 | 0.0 | 30 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| RESEARCH PRESENTATION | 1 | 12 | 2.5 | 0.0 | 30 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| DATA PRESENTATION | 1 | 12 | 2.5 | 0.0 | 30 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| **SHORT TERM TRAINING** | 29,579 | 64,217 | | | 880 | 9,615 | 110 | 1,629 | 165 | 1,629 | 165 | 1,599 | 165 | 1,597 | 165 | 1,596 | 110 | 1,567 | 10,497 |
| **OUT-OF-COUNTRY** | 160 | 160 | | | 880 | 0 | 110 | 0 | 165 | 0 | 165 | 0 | 165 | 0 | 165 | 0 | 110 | 0 | 880 |
| SHORT COURSES | 60 | 60 | 5.5 | 0.0 | 330 | 0 | 55 | 0 | 55 | 0 | 55 | 0 | 55 | 0 | 55 | 0 | 55 | 0 | 330 |
| GOV. PLNG.PROGRAM OBSERV.TOURS | 100 | 100 | 5.5 | 0.0 | 550 | 0 | 55 | 0 | 110 | 0 | 110 | 0 | 110 | 0 | 110 | 0 | 55 | 0 | 550 |
| **IN-COUNTRY** | 29,419 | 64,057 | | | 0 | 9,615 | 0 | 1,629 | 0 | 1,629 | 0 | 1,599 | 0 | 1,597 | 0 | 1,596 | 0 | 1,567 | 9,617 |
| *PRE-SERVICE TRAINING* | | | | | | | | | | | | | | | | | | | |
| EXTENSION | 10,000 | 5,000 | 0.0 | 0.135 | 0 | 675 | 0 | 135 | 0 | 135 | 0 | 108 | 0 | 108 | 0 | 108 | 0 | 81 | 675 |
| *IN-SERVICE TRAINING* | | | | | | | | | | | | | | | | | | | |
| SUBJECT MATTER SPECIALISTS | 900 | 2,700 | 0.0 | 0.135 | 0 | 365 | 0 | 61 | 0 | 61 | 0 | 61 | 0 | 61 | 0 | 61 | 0 | 60 | 365 |
| GOVERNORATE (ES) STAFF | 217 | 651 | 0.0 | 0.135 | 0 | 88 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 15 | 0 | 14 | 0 | 14 | 88 |
| DISTRICT SUPERVISION (ES) | 650 | 1,950 | 0.0 | 0.135 | 0 | 263 | 0 | 44 | 0 | 44 | 0 | 44 | 0 | 44 | 0 | 44 | 0 | 43 | 263 |
| VETERINARIANS | 1,000 | 3,000 | 0.0 | 0.135 | 0 | 405 | 0 | 68 | 0 | 68 | 0 | 68 | 0 | 67 | 0 | 67 | 0 | 67 | 405 |
| EXTENSION AGENTS | 12,000 | 36,000 | 0.0 | 0.135 | 0 | 4,860 | 0 | 810 | 0 | 810 | 0 | 810 | 0 | 810 | 0 | 810 | 0 | 810 | 4,860 |

197

**NATIONAL AGRICULTURAL RESEARCH PROJECT**
(263-0152)
AMENDMENT NO. 2

**AGRICULTURAL TECHNOLOGY TRANSFER COMPONENT**
**TRAINING COST ESTIMATE**
**($000)**

**PROJECTION OF EXPENDITURES BY FISCAL YEARS**

| ILLUSTRATIVE TRAINING PROGRAM | No. OF PART. | TRG. MO.(T.M) | COST PER UNIT | | TOTAL | | FY89 | | FY90 | | FY91 | | FY92 | | FY93 | | FY94 | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | |
| FOLLOW UP ( CENTRAL & LOCAL) | 1,352 | 4,056 | 0.0 | 0.135 | 0 | 548 | 0 | 92 | 0 | 92 | 0 | 91 | 0 | 91 | 0 | 91 | 0 | 91 | 548 |
| CENTRAL ES STAFF | 400 | 1,200 | 0.0 | 0.135 | 0 | 162 | 0 | 27 | 0 | 27 | 0 | 27 | 0 | 27 | 0 | 27 | 0 | 27 | 162 |
| SEMINARS | 1,000 | 2,500 | 0.0 | 0.135 | 0 | 338 | 0 | 57 | 0 | 57 | 0 | 56 | 0 | 56 | 0 | 56 | 0 | 56 | 338 |
| SEMINARS-SMS-EXT. AGENTS | 900 | 4,500 | 0.0 | 0.35 | 0 | 1,575 | 0 | 263 | 0 | 263 | 0 | 263 | 0 | 262 | 0 | 262 | 0 | 262 | 1,575 |
| WORKSHOPS | 1,000 | 2,500 | 0.0 | 0.135 | 0 | 338 | 0 | 57 | 0 | 57 | 0 | 56 | 0 | 56 | 0 | 56 | 0 | 56 | 338 |
| TOTAL | 29,598 | 64,769 | | | 2,260 | 9,615 | 320 | 1,629 | 675 | 1,629 | 555 | 1,599 | 375 | 1,597 | 225 | 1,5[illegible]8 | 110 | 1,567 | 11,877 |

**NATIONAL AGRICULTURAL RESEARCH PROJECT**
(263-0152)
AMENDMENT NO. 2

AGRICULTURAL TECHNOLOGY TRANSFER COMPONENT
COMMODITY COST ESTIMATE
($000)

PROJECTION OF EXPENDITURES BY FISCAL YEARS

| ILLUSTRATIVE COMMODITIES ITEMS | NUMBER OF UNITS | | | COST PER UNIT | | TOTAL | | FY89 | | FY90 | | FY91 | | FY92 | | FY93 | | FY94 | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CAAES | AERDRI | GOVERN | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | |
| **OFFICE EQUIP./ SUPPLIES** | 53 | 105 | 4,180 | | | 807 | 2,688 | 0 | 1,124 | 220 | 1,124 | 587 | 110 | 0 | 110 | 0 | 110 | 0 | 110 | 3,495 |
| COMPUTER / SOFTWARE | 7 | 12 | 20 | 5.0 | 0.0 | 195 | 0 | 0 | 0 | 0 | 0 | 195 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 195 |
| COPIER | 3 | 10 | 20 | 3.0 | 0.0 | 99 | 0 | 0 | 0 | 0 | 0 | 99 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 99 |
| COLLATING COPIERS | 1 | 1 | 20 | 7.5 | 0.0 | 165 | 0 | 0 | 0 | 0 | 0 | 165 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 165 |
| MICROFICHE | 1 | 0 | 0 | 3.0 | 0.0 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| TYPEWRITERS | 16 | 30 | 60 | 1.0 | 0.0 | 106 | 0 | 0 | 0 | 0 | 0 | 106 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 106 |
| BINDING MACHINES | 8 | 10 | 20 | 0.5 | 0.0 | 19 | 0 | 0 | 0 | 0 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19 |
| OFFICE FURNITURE | 15 | 40 | 4,000 | 0.0 | 0.5 | 0 | 2,028 | 0 | 1,014 | 0 | 1,014 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2,028 |
| OFFICE SUPPLIES | 2 | 2 | 40 | 5.0 | 15.0 | 220 | 660 | 0 | 110 | 220 | 110 | 0 | 110 | 0 | 110 | 0 | 110 | 0 | 110 | 880 |
| **VEHICLES** | 30 | 60 | 2,540 | | | 5,599 | 0 0 | 2,052 | 0 | 3,547 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 0 | 5,599 |
| VANS | 5 | 20 | 40 | 23 | 0 | 1495 | 0 | 0 | 0 | 1495 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1495 |
| MOTORCYCLES | 25 | 40 | 2500 | 1.6 | 0 | 4104 | 0 | 2052 | 0 | 2052 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4104 |
| **MEDIA PRODUCTION EQUIP.** | 72 | 62 | 980 | | | 2,815 | 0 | 0 | 0 | 2,190 | 0 | 625 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2,815 |
| MOBILE VANS | 5 | 0 | 20 | 50.0 | 0.0 | 1,250 | 0 | 0 | 0 | 625 | 0 | 625 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,250 |
| VIDEO RECORDER/T.V. SETS | 10 | 10 | 160 | 2.0 | 0.0 | 360 | 0 | 0 | 0 | 380 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 360 |
| VIDEO CAMERA, TRIPOD, ETC. | 20 | 10 | 160 | 2.0 | 0.0 | 380 | 0 | 0 | 0 | 380 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 380 |
| OVERHEAD PROJECTOR | 15 | 10 | 160 | 0.6 | 0.0 | 111 | 0 | 0 | 0 | 111 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 111 |
| TRANSPARENCY MAKERS | 5 | 10 | 160 | 1.0 | 0.0 | 175 | 0 | 0 | 0 | 175 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 175 |
| 35MM CAMERA / FILMS | 10 | 10 | 160 | 1.5 | 0.0 | 270 | 0 | 0 | 0 | 270 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 270 |
| INSTRUCTION EQUIPMENT | 7 | 12 | 160 | 1.5 | 0.0 | 269 | 0 | 0 | 0 | 269 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 269 |
| **TOTAL** | 155 | 227 | 7,700 | | | 9,221 | 2,688 0 | 2,052 | 1,124 | 5,957 | 1,124 | 1,212 | 110 | 0 | 110 | 0 | 110 | 0 | 110 0 | 11,909 |

**NATIONAL AGRICULTURAL RESEARCH PROJECT**
(263-0152)
AMENDMENT NO. 2

AGRICULTURAL TECHNOLOGY TRANSFER COMPONENT
SERVICES COST ESTIMATE
($OOO)

PROJECTION OF EXPENDITURES BY FISCAL YEARS

| ITEMS | | FY89 | | FY90 | | FY91 | | FY92 | | FY93 | | FY94 | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | US$ | LC | |
| DEMONSTRATION | | 0 | 680 | 0 | 680 | 0 | 680 | 0 | 680 | 0 | 680 | 0 | 680 | 4,080 |
| TRAVEL | *** | 0 | 500 | 0 | 375 | 0 | 250 | 0 | 125 | 0 | 0 | 0 | 0 | 1,250 |
| MAINTENANCE | *** | 0 | 230 | 0 | 173 | 0 | 115 | 0 | 58 | 0 | 0 | 0 | 0 | 576 |
| PRINTING | *** | 0 | 140 | 0 | 105 | 0 | 70 | 0 | 35 | 0 | 0 | 0 | 0 | 350 |
| MEDIA | *** | 0 | 160 | 0 | 120 | 0 | 80 | 0 | 40 | 0 | 0 | 0 | 0 | 400 |
| ADMINISTRATION | *** | 0 | 90 | 0 | 68 | 0 | 45 | 0 | 23 | 0 | 0 | 0 | 0 | 226 |
| RENOVATION | | 0 | 1,000 | 0 | 1,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2,000 |
| TECHNOLOGY TRANSFER GRANTS | | 75 | 425 | 75 | 525 | 125 | 475 | 100 | 500 | 50 | 550 | 0 | 600 | 3,500 |
| **TOTAL** | | 75 | 3,225 | 75 | 3,046 | 125 | 1,715 | 100 | 1,461 | 50 | 1,230 | 0 | 1,280 | 12,382 |

COST ASSUMPTIONS

1. DEMONSTRATION: 1 DEMONSTRATION PER VILLAGE/YEAR, 25 VILLAGES PER DISTRICT, 8 DISTRICTS PER GOVERNORATE, 20 GOVERNORATES @ $170/DEMONSTRATION (ONE FEDAN) @ 6 YEARS.
2. TRAVEL: 4000 VILLAGE EXTENSION AGENTS @ 200 DAYS/YEAR + 1335 DISTRICT STAFF @ 120 DAYS/YEAR + 460 GOVERNORATE STAFF @ 87 DAYS/YEAR ; @ $0.50 /DAY
3. MAINTENANCE: 20 GOVERNORATES, @ $11500/YEAR
4. PRINTING: 20 GOVERNORATES @ $7000/YEAR
5. MEDIA: 20 GOVERNORATES @ $8000/YEAR
6. ADMINISTRATION: 20 GOVERNORATES @ $4500/YEAR
7. RENOVATION: 20 GOVERNORATES @ $100000/GOVERNORATE
8. TECHNOLOGY TRANSFER GRANTS: FUNDS ARE SET ASIDE FOR SMALL GRANTS TO INDIVIDUALS OR ORGANIZATION.

*** THESE OPERATIONAL COSTS WILL BE SHARED WITH MOA, THE ABOVE AMOUNTS REPRESENT AID CONTRIBUTION WHICH ACCOUNT FOR 100% IN YEAR 1, 75% IN YEAR 2, 50% IN YEAR 3, AND 25% IN YEAR 4.

# ILLUSTRATIVE ACTION-ORIENTED STUDIES TO BE DONE BY AERDRI

# DETAILED BUDGETS