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THREE EXAMPLES OF PILOT AGRICULTURAL ACTIVITIES

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Egypt is confronted with an immediate problem of obtaining wider use of crop and soil management practices designed to produce substantially higher yields of crops from the six (6) million feddans of land now being irrigated. Land reclamation and development followed by settlement of landless farmers, is highly desirable but at best, progress is slow. In the meantime, Egypt's population is increasing rapidly and the productivity of the farm lands continues to decline. The serious situation with which Egypt is confronted can be emphasized by calling attention to the fact that the agricultural imports during 1949 - 1950 and 1951 exceed the country's agricultural exports almost exactly three times and the further fact that 77 percent of the total agricultural imports consist of bread grains and flour, fruits and vegetables, dairy products, sugar and syrups, and other supplementary commodities now produced in Egypt.

Fortunately, there are several agricultural activities which can be undertaken at once on a "pilot plant" or demonstration basis and which are practically certain to increase the production of essential foods at a minimum of expense. The following are examples of "pilot plant" agricultural activities which qualify for consideration as part of the EARIS program, since (1) they may be repeated in other provinces in Egypt, and (2) they represent activities which the GOE is not prepared to undertake without assistance.

I. Distribution of Pure Seed: The Ministry of Agriculture has produced 275,000 bushels of high quality seed of giza 139 wheat, a rust-resistant variety which yields one ardeb (5.5 bushels) more per acre than other wheats previously grown. It is recommended that EARIS assist the Ministry of Agriculture and the TCA Agricultural Staff in Egypt in distributing the entire amount of this rust-resistant wheat among the farmers of the Buheira and Fayoum Provinces for planting in the Fall of 1953. At the rate of 2.4 bushels per acre, 275,000 bushels would be sufficient to plant 114,583 feddans. Assuming an average yield, it should be possible to harvest 4,000,000 bushels of wheat in 1954, or more than enough to plant the total wheat acreage of Egypt for the 1955 harvest. The following comparisons are informative:

	1953	1954	1955	1956
eed For Planting	275,000 Bu	3,610,000 Bu	3,610,000 Bu	3,610,000 Bu
ncreased Yield from Imp. Seed		630,000 Bu	8,272,600 Bu	8,272,600 Bu
quiv. New Land -	Feddans	18,000 F.	236,360 F.	236,360 F.

If farmers are required to trade one bushel of their planting seed for ach bushel of Giza 139 which they receive, the cost of putting this project nto operation could be reduced by the market value or sale price of the wheat hus acquired. The increased yield from Giza 139 during 1955 and 1956 when

the full wheat acreage could be planted with this rust-resistant wheat would be in excess of $16,000,000 annually. Further, the increased yield possible if this variety is used on the entire wheat acreage of Egypt would represent the equivalent of the production from 236,360 feddans of new land.

II. Hybrid Maize: Experience with seed of hybrid maize in Egypt indicates that yields twenty-five (25) percent greater than that obtained from open-pollinated varieties are to be expected.

The TCA hybrid corn specialist now in Egypt has made the following recommendations:

A. For 1953: Demonstrations of three hybrids and the locally adapted open-pollinated variety in both the Buheira and Fayoum Provinces, the number of demonstrations to be determined by the seed available.

B. For 1954: Continue and increase the number of demonstrations to compare hybrids with local open-pollinated variety.

Encourage the Ministry of Agriculture to allocate twenty-five (25) percent of their prospective 20,000 bushel production of hybrid maize seed to the Buheira and Fayoum Provinces. In case supply from Ministry is not available, EARIS should requisition 5,000 bushels of hybrid maize seed from the United States. (At present there is an Embargo on U.S. double-cross maize seed.)

With approval of the Ministry of Agriculture, initiate the production of hybrid maize seed by at least two producers in each Province. U.S. or Egyption single crosses should be available.

C. For 1955: With three possibilities working, namely - (1) imports of U.S. double-cross seed; (2) production by Ministry of Agriculture; and (3) production by selected Egyptian private operators, seed should be available to plant fifty (50) percent of the total maize acreage to adapted hybrids.

	1953	1954	1955	1956
Seed Planted - Bushels	Dem.	5,000	145,264	290,000
Increased Yield - Metric Tons		6,840	183,032 T	366,064 T
Equiv. New Land - feddans		7,490	217,895 F	435,790 F

Comment: By planting Egypt's entire acreage of maize to hybrid seed in 1956 the increased yield would amount to 366,064 metric tons or 14,407,233 bushels. This increase represents the equivalent production of about 436,000 feddans of new land.

III. Chemical Fertilizers: It is recommended that 5,000 feddans of cotton in the Buheira Province and 2,000 feddans of cotton in the Fayoum Province be selected to receive applications of commercial or chemical fertilizers of the kinds and in the amounts customarily recommended by the agricultural technicians of the Ministry of Agriculture.

	1953	1954	1955	1956
Tons to apply	-	700 T	700 T	700 T
Increased Yield	-	762 T	762 T	762 T
Equiv. New Land		1400 F	1400 F	1400 F

Comment: If by the use of chemical fertilizers generally on the total cotton acreage of these two demonstration provinces, it becomes possible to increase total production sufficiently to produce the present yield on one-fifth less acres, a total of 68,500 feddans of cotton could be released for the production of foods for human and animal consumption. At 35 bushels per feddan, the acreage thus released from cotton should produce about 2,400,000 bushels of wheat, a product much in demand in Egypt.

Summary: The Pilot Plant Activities suggested above, if put into operation as outlined, would result in substantial increases in production of two important food crops - wheat and corn, and Egypt's leading export commodity, cotton. By 1956, the increased production from wheat and corn would represent the equivalent of a total of 672,000 feddans of new land. By applying fertilizers to the entire cotton acreage of the Buheira and Fayoum Provinces, over 68,000 acres could be released for the production of 2,400,000 bushels of wheat.

Even if these pilot plant activities could achieve only 25 percent of the theoretically possible goal, the increased return of agricultural commodities would be equivalent to the addition of 185,000 feddans of new land.

EATIS - Agriculture

SUMMARY OF PROGRAM FOR INCREASED AGRICULTURAL PRODUCTION IN THE BEHEIRA AND FAYOUM PROVINCES.

Background and Objectives:

1. Agricultural activities in Egypt constitute the base on which the National Economy must stand.
2. 22,000,000 people - 6,000,000 Feddans.
   a. 3.5 persons per feddan.
   b. Nile river the foundation.
3. Increase production on present land.
4. Increase available productive land.

Items three and four above are certainly complementary. Increasing the productivity of present land, by 10% is a very reasonable goal. (Maize production can be increased 30% by the introduction of hybrid maize seed alone). This 10% increase in productivity would in reality increase by 60,000 feddans present productive lands. This, added to the reclamation of 33,000 feddans of productive land in Beheira and Fayoum provinces, would contribute remarkably to the National economy.

Proposed Program:

The agricultural problems in general are similar in the two provinces and the reclaimed areas. There are differences in soil types, markets, irrigation and drainage problems, and adapted crops but for purposes of this brief summary, we shall consider the Agricultural program as it is applied to all areas.

1. Recommendations for Increasing Agricultural Production:
   a. Increased use of Pure seed of improved varieties:
      (1) Hybrid maize - production increase 30%.

(ii) Wheat - Giza 139 - production increase one ardeb per feddan.

(iii) Continue good work on cotton.

(iv) Use extension service to get acceptance of new varieties as developed by the Ministry and Universities.

b. Improved Crop and soil management, including fertilizers:

(i) Decline in crop yields as reported a most serious problem.

(ii) Demonstrate in two provinces the value of:

1. Proper crop rotations - adapted to soil.

2. Proper fertilization - Chemical and other.

3. Rate and date of seeding.

4. Importance of soil tilth as afficted by water.

c. Drainage problems:

(i) Soil salinity problems.

(ii) Tile drainage.

d. Increased production of vegetables for family use:

(i) By demonstration of value of family garden.

(ii) Records may prove point.

2. Improved Breeding and Management of Livestock:

a. Sids experimental farm reports excellent results from breeding Baladi cows to registered Jersey bulls.

(i) Use of proven sires possibly owned by co-operative.

(ii) Breeding stations may develop excellent strains from crossing program.

b. Introduction of good strain of milk goat.

c. Sheep offer opportunity for progress.

(i) Breeding as indicated with dairy cattle.

(ii) Docking and castrating.

d. Demonstrate value of management and feeding practices - include higher percentage of pasture.

3. Increased Production of Poultry on Eggs:

a. Exports of eggs are reducing.

b. Now produce only 23 eggs per capita.

c. Demonstrate superiority of improved poultry from experimental farms and U.S.A.

d. Demonstrate up-to-date poultry management.

e. Value of poultry in family diet.

4. Reduce Production Losses Due to Disease, Insects and Weeds:

a. Demonstrate ability of some varieties to resist attacks.

b. Encourage breeding programs toward that end:

(i) Hybrid maize.

(ii) Wheat - rusts - smuts.

c. Demonstrate efficiency of agricultural chemicals.

5. Improvement of Fisheries:

The areas of fisheries participation in the EARIS Program are chiefly two:

a. Utilization of community storage and ice facilities in the Fayoum District.

b. Development of Pond Fisheries.

A project of this nature would most likely be

initiated in the Beheira area but may find application in Fayoum as well. In the development of pond fisheries as a continious food production program, these ponds would appropriately be located where they would not compete with water use on prime agricultural lands but rather utilizing drain waters on lands classed as marginal for agricultural use.

6. Agricultural Credit.

   a. Resources of credit are inadequate.

   b. Use of adequate credit limited to large land holders.

   c. Credit must be available to average fellaheen - not from money lenders.

   d. Agricultural Credit and Cooperative Bank and the Agricultural Mortgage Bank of Egypt render fine service and provide a base from which to launch an agricultural credit program.

7. Agricultural Cooperatives:

   a. By 1948 - 2,000 cooperatives, 775,000 members, L.E. 11,000,000 business

   b. Encourage more local responsibility with aim toward operation with less assistance from government.

<u>Organization to Carry out Program:</u>

1. Develop National Extension Service - (Detail Report attached).

2. Continue Agricultural Research -

   a. Point research to Fellaheen's problems.

      (i) May encourage practical research at expense of basic.

b. May be necessary to do more research in provinces.

Procedures to Carry out EARIS Program:

The detailed budget and personnel requirements necessary to carry out this program are listed in the complete report prepared by Dr. McKee.

In conclusion let us consider that the results of this program are to serve as a 'pilot plant' for the whole of Egypt. The fellaheen living in the two provinces is the judge. Did we assist him in improving his standard of living or did we merely reclaim a few feddans of land and increase the maize yield 30%? A balanced program, directed by the Government of Egypt, will insure the desired result.

Recommendations:

1. That Project Agreement S-Agri-Eng No.1 substantially as attached be processed and activated as the first step and personnel training project of Egypt's soil and land classification program.
2. That Project Agreement substantially as attached for establishment of the Egyptian Laboratory for Investigation of Soil Salinity be processed and activated to provide basic research support for the improved soil management program for Egypt.
3. That a Soil Research and Management Committee of technicians representing public and private agencies concerned be formed by National law; that formal recommendation for formation of such committee be forwarded substantially as Table C.

4. That an Extension Service be Activated in the first stages of settlement with adequate personnel, Equipment, Transportation facilities and budget to encourage the adoption of improved practices that will increase production and improve standards of living.

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PROGRAM FOR INCREASED AGRICULTURAL PRODUCTION

IN THE

BEHEIRA AND FAYOUM PROVINCES

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EXPLANATORY STATEMENT

This report has been prepared after joint conferences of the Agricultural Services Sub-committee of the T.C.A. Planning Committee with the Agricultural Staff of T.C.S. in Egypt. It is proposed as a tentative draft of the agricultural phase of the Cooperative Program of Community Development and Rural Rehabilitation in the Egyptian Provinces of Beheira and Fayoum and is intended to show how the programs of the various Ministries, Government of Egypt and the Technical Cooperation Administration, Government of the United States may be related to the EARIS PROGRAM.

In its present form this report represents an effort to combine the suggestions of representatives of the Government of Egypt, especially the National Production Council and the several Ministries directly and indirectly concerned with rural development and improved welfare of the fellaheen; the Regional Office, Food and Agriculture Organization, Cairo, and the Government of the United States of America including among others the technical staff, T.C.A. in Egypt; the Agricultural attache, American Embassy, Cairo, and the members of the Task Force, T.C.A. temporarily assigned to Egypt. Information on the Agriculture of Egypt, gathered from published and unpublished reports, has been considered.

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I. The Agricultural Situation in Egypt: In order that the proposed program of the agricultural phase of the EARIS project may be more fully understood, it is appropriate to present a brief review of the agricultural situation in Egypt.

A. Agriculture as a source of living: Dr. Afif I. Tannous, an internationally known student of agricultural affairs in the Arabic-speaking countries, has emphasized that -- "since the dawn of human history, agriculture has played a leading role in the development of Egypt". He further points out that agriculture was mainly responsible for Egypt's growth into a center of world culture in ancient times and for its transition into a national entity in modern times.

Agricultural activities in Egypt constitute the base on which the national economy must stand. In addition to the value of the commodities produced on the land, it is significant that the majority of Egypt's industries depend on agricultural products for their raw materials. These include.

among others, processing of local agricultural products; cotton ginning; spinning and weaving; preparation of rice; flour milling; sugar manufacture; food canning, etc.

B. Importance of the Nile River: Egyptian agriculture, with minor exceptions, is totally dependent upon the Nile River. In fact, agriculturally, the Nile Valley, from the Egypt-Sudan border to Cairo and the Delta below Cairo, is Egypt. The Nile River is synonymous with life for Egypt because all life - plant, animal and human - is dependent upon the waters of that stream. South of Cairo, in the valley of the Nile, there is little or no precipitation. At Cairo the annual precipitation is normally only slightly more than one inch, and at Alexandria the annual rainfall average 7.5 inches.

The Nile River is the foundation upon which Egypt has existed and developed since the dawn of history. Water is so essential to the economy of Egypt that any program of land reclamation and development which fails to provide an adequate supply for irrigation is fore-doomed to failure.

The EARIS PROGRAM is very definitely pointed toward making the best possible use of the remaining unappropriated waters of Egypt.

C. Egypt's Population: The real strength of a nation rests in its people. The people must be well fed, adequately clothed, comfortably housed, have good health, and be educated sufficiently to develop sound judgements on which to base constructive suggestions for intelligent leadership.

Egypt today has a total population of approximately 22 million people, supported by the production of about 6 million acres, plus necessary imports. Each acre of productive crop land must now support the equivalent of 3.5 persons or approximately 2,250 people per square mile. The population of Egypt is increasing more rapidly than new land is becoming available. Estimates place the population increase at two percent annually. Four hundred and forty thousand births annually means 1,200 more people to feed each morning of the year than were fed the previous day.

D. Productive Land Available in Egypt: A recent report by Professor Mario Bandini of Italy indicates that 6,037,000 feddans (acres) of land in Egypt are irrigated and intensively cultivated. This productive land represents only 2.4 percent of the total land area. However, because of perennial irrigation and a year-long growing season, the Egyptian fellaheen make each acre do the work of one and one-half acres. In other words, while there were an average of slightly more than six (6) million surface acres of land in production in 1951 and 1952, a total of 9,282,682 acres of crops were reported.

Those who are familiar with the land resources of Egypt estimate that, at best, only 1.5 million acres additional can be put under cultivation, raising the total area of land capable of crop production to approximately 7,500,000 acres, or a total potential of 11,250,000 crop acres annually.

Again, it must be emphasized that additions of new land through reclamation of marsh areas and extensions of irrigation projects on desert areas are doomed to failure unless an adequate supply of irrigation water is made available. (see I-B above).

E. Productive Land In Relation to Population: The tremendous pressure of Egypt's population on the nation's land resources has been a serious problem for decades and rapidly is becoming critical. The living conditions of the farmers are extremely unfavorable, largely because fifteen (15) million people - seventy-five (75) percent of Egypt's total population live on six (6) million acres of land. This means about one prolific family to each two or three acres.

The present leaders of Egypt recognized the tragic plight of the fellaheen by enacting the Land Reform Law in September, 1952, expropriating large estates and farms of over 200 feddans, and placing controls over land rentals, farm wages, agricultural credit, etc. This decree gave hope for the day when Egyptian agriculture would provide fuller employment to the millions who know no other means of livelihood. However, it is necessary to face the stern reality that the Land Reform decree can at best, only partially satisfy the desire for land on the part of the Egyptian Fellaheen. Prof. Bandini of Italy, after a study of Egypt's land problem, estimated that the Land Reform Law will make available only 600,000 feddans of land, (after providing for legal exemptions) to supply the needs of two million "landless" farmers. At the rate of 5 feddans per farmer, the 600,000 feddans is sufficient for only 120,000 farmers, leaving 1,880,000 others who must remain "landless" until other means can be found to satisfy their desire for land.

Some individuals place considerable hope in land reclamation and development, but while this will help there are limitations. If present day estimates of 1,500,000 feddans of reclaimable land are correct, farms of 5 feddans each can be made available for 300,000 potential owners, leaving approximately one and one-half million "landless" farmers. This combined with Egypt's present population increase of 440,000 annually creates a situation which will require national action far more heroic than the Land Reform Law of 1952.

F. Agricultural Regions of Egypt: Agriculturally, the productive land of Egypt consists of the Delta or "Lower Egypt" north of Cairo, and a narrow strip of land on either side of the Nile, south of Cairo, divided into "Middle Egypt" and "Upper Egypt".

Almost sixty-two (61.7) percent of Egypt's productive land is located in the Delta and, with perennial irrigation permitting the production of two to three crops annually, produces the bulk of the country's agricultural commodities. Middle Egypt has 19.9 percent of the productive land and Upper Egypt, 19.3 percent.

The greater part of Egypt's land area (97.8 percent) is desert where there is no irrigation and where dry farming cannot succeed. For this land, the roving Bedouin, with his camels, goats, sheep and cattle, has developed a pastoral economy, which it is not wise to disturb. The Bedouin's livestock converts the desert vegetation into meat, milk, wool, hair, skins and hides, a significant, though erratic source of national income which should be given more stability.

G. Agricultural Seasons: Agricultural activities under perennial irrigation in Egypt are adjusted to three agricultural or crop seasons. The Shitwi or "winter season" extends from October to June and is most favorable for wheat, barley, berseem, onions, beans, flax and lentils. The Seifi or "summer season" extends from February to September and is the best time of year for cotton, rice, sugar cane, millet and peanuts. The Nile or "flood season" covers the period from July to December with corn or maize as the principal crop. Perennial irrigation and the over-lapping agricultural or crop seasons make it possible for one acre to do the work of one and one-half acres.

H. Principal Sources of Agricultural Income: According to the Ministry of Agriculture, the total value of all agricultural production in Egypt for 1945-46 to 1949-50 was estimated at LE.318,916,000, and for 1950-51 was LE. 478,835,000. The reports of the Agricultural Attache, American Embassy, Cairo, places the valuation for 1951-52 at LE. 445,550,000 and for 1952-53 at LE. 336,680,000. It is well to point to the fact that the increased valuation of agricultural commodities produced in Egypt during the past decade has been due to more favorable price levels. The productive capacity of Egypt's farm lands has decreased at least ten (10) percent since 1935-1939.

For the period 1945-46 to 1949-50, the Ministry of Agriculture reports that approximately eighty (80) percent of Egypt's total agricultural production was composed of crops and only twenty (2)) percent was derived from livestock and poultry. The actual contribution of livestock and poultry to the national agricultural economy is undoubtedly considerably higher than twenty (20) percent because of the prevalent practice of home or family use of meat, milk, cheese, poultry, eggs, etc., which removes these items from the usual channels of trade.

Commodities	1945-46 to 1949-50 Value	percent
Cotton	LE. 79,246,000	24.8
Cereals	LE. 90,526,000	28.4
Pulses	LE. 12,296,000	3.8
Other Field Crops	LE. 53,166,000	16.6
Vegetables	LE. 11,213,000	3.5
Fruits	LE. 8,159,000	2.5
Meat Products	LE. 30,540,000	9.6
Dairy Products	LE. 21,614,000	6.7
Raw Wool	LE. 513,000	0.1
Poultry and Eggs	LE. 11,419,000	3.5
Total:	LE.318,692,000	99.5

I. Agricultural Credit and Agricultural Cooperatives:

1. The General Situation: A.Z.A. Sheira, in his paper "The Agricultural Credit System in Egypt" presented at the International Conference on Agriculture and Cooperative Credit held at Berkeley California in 1952, comments as follows regarding the principal features of the credit situation:-

"Credit is obtained from money lenders, various business enterprises, government agencies and private institutions. The majority of the credit institutions are financed and operated by foreigners. Egyptian Credit institutions are only two in number. One was established in 1931 and is half owned by the government. The other is entirely owned by the government and was established in 1941. Private or cooperative institutions which are wholly owned by Egyptians do not exist. On the whole, the resources of credit are inadequate and not suited to the needs of Egyptian agriculture."

"The users of credit are mostly big landowners who own relatively large-sized holding that they can offer as security. Landless agricultural groups cannot therefore borrow from the credit banks. Small farm owners, who constitute the majority of landowners, do not benefit from the existing credit system since the loans that they can obtain on the basis of their small property are too small to be useful. Besides most of the existing credit institutions do not deal with small owners or tenants. Thus, they are left to rely heavily on unorganized sources of credit, such as money lenders. The evils of money lenders are undebatable".

Although the maximum per annum rate of interest is fixed by law at 10 percent it is estimated that the rate paid money lenders by small farmers for production credit ranges upward to 50 percent and some times higher. As a result the great majority of small farmers are without a source of credit at reasonable rates.

2. The Agricultural Credit and Cooperative Bank: The Agricultural Credit Bank of Egypt was organized in 1931 as a joint stock company with the Government owing one half of the capital stock and private interests, principally commercial banks, the other half. The Bank was converted into an Agricultural Credit and Cooperative Bank in 1949, its capital increased to LE. 1,500,000 with one-half owned by the Government, one-third by private interests, and the remainder by cooperatives. Control of the Bank rests in the Government.

   Loans made by the Bank are of three types, namely, short term crop and commodity loans, medium term for machinery and livestock purchases and long term for land improvement. About 75 percent of the credit is extended directly to farmers by the Bank. The balance is loaned through cooperatives. The Bank maintains its head office in Cairo. Ithas a branch in each Province and sub-branches in each of 114 Markaz. About 1,000 stores and approximately LE. 13,000,000. The interest rate to farmers is five percent.

3. The Agricultural Mortgage Bank of Egypt: In 1935, the Government set up a department in the Agricultural Credit Bank of Egypt to make long term mortgage loans. In 1941, this branch became a separate institution called the Agricultural Mortgage Bank of Egypt. The Bank which is wholly Government owned extends long term credit secured by first mortgages. The loans extended are limited to 60 percent of the normal value of the land with a maximum of 50 pounds per feddan. Interest is fixed at 5 percent. Loan maturities range from 5 to 30 years. The minimum amount loaned is 50 pounds and the maximum 10,000 pounds.

4. Agricultural Cooperatives: The first cooperative societies in Egypt were organized about 1907. However, it was not until 1923 that the cooperative movement received the active support of the Government. Enabling legislation was passed at that time and a Department of Cooperatives established in the Ministry of Agriculture. It was given the responsibility of sponsoring the movement and supervision of societies. By the end of 1930, a total of 297 societies were organized.

   In 1939, the Department of Cooperatives was transferred to the Ministry of Social Affairs and remains there today. The Department was expanded and the movement given renewed emphasis. However, it was not until the early 1940's that material expansion in the number of societies took place. At the end of 1940 there were 821 societies, in 1945 there were 2,018 and in 1948 there were 2,009. These societies, at the end of 1948 had 774,106 members and did LE.11,348,209 worth of business. Practically all of the societies are agricultural cooperatives. It is estimated that they serve about one-third of the people living on the land.

   Control of the cooperative movement is largely in the Government which registers the societies, approves their regulations and by-laws and audits their financial affairs.

The Cooperative Law of 1944 prescribes the manner in which societies may be established and regulates their operations. The Department of Cooperatives is assisted in its work with the societies by a (1) Higher Cooperative Advisory Council located in Cairo and made up largely of government officials and (2) Provincial Co-operative Advisory Councils, one of which is located in each Province. The Provincial Councils too are made up largely of Government representatives with three of each ten-man Council selected by the societies. Provision is made by the cooperative act of 1944 for gradual transfer of the control of the societies from the Government to unions of cooperatives.

The scope of activities in which societies may engage embraces practically all phases of farm life. This includes purchasing of machinery and the reclamation of land. The societies are multi-purpose in type and are organized in conformity with recognized cooperative principles.

The cooperative movement is subject to a high degree of government management and control. Whether the movement will develop into one of local ownership and local control under these conditions will depend on the council and guidance of those now sponsoring its organization and the education of the fellaheen in the principles of cooperation.

J. Egyptian Agriculture and the Fellah: Basically, agriculture in Egypt is largely dependent upon the fellah and equipment and techniques which were used in Biblical times. Some examples are the wooden plow drawn by oxen; grain sown broadcast and covered by plowing; irrigation water lifted from canals by the hand-operated shadoof or water wheels propelled by animals; grain crops harvested with a hand sickle and threshed with the norag drawn by oxen.

Egypt's agricultural economy flourishes primarily upon manual labor which is cheap and with which modern machinery has not yet been able to complete successfully. However, Egypt's agriculture is not backward; in fact, is quite progressive. Irrigation water is well-channeled and distributed; approximately thirty percent of the total crop acreage is devoted to legumes, of which berseem is most important; extensive use is made of commercial fertilizers, animal manures and canal sediment to maintain fertility; little or no land is wasted and a diversity of crops distributes labor and provides stability to agricultural activities.

K. Nutrition and Sanitation In Relation to Efficiency of Agricultural Labor: Reports of the Ministry of Agriculture (1950-51) show a per capita daily caloric intake of 2337 calories, which was twenty four (24) percent below that as shown in the Ministry's report for 1929-30. Egypt's report to FAO throws a significant sidelight on food and nutritional deficiencies when it refers to "the high mortality rate of pre-school children and the slow rate of growth exhibited by those who survive is far from satisfactory".

Studies of food intake and nutrition made by the Ministry of Health in 1946 attributed inadequate food intake to (1) low income; (2) Inadequate local production in certain areas of Egypt, and to

A recent press release points to Bilharziasis as "the most serious and ruinous disease in Egypt today", being responsible for deaths, suffering and loss of production man-power almost beyond belief. Unfortunately, the fellaheen suffer most, as they are in almost daily contact with canals, drains, etc., inhabited by the snails which are carriers of the disease.

World Health Organization in collaboration with the Ministry of Health is embarking on a program of bilharziasis control in Egypt in which modern methods will be coordinated in a concentrated attack.

L. Post-War Changes In Egyptian Agricultural Trade (Information furnished by American Embassy, Cairo). Significant changes have occurred in Egyptian agricultural trade in recent years compared with prewar.

1. Agricultural Exports: Agricultural products exported in post-war have contributed even more heavily to total foreign trade earnings than in pre-war, about 91 percent for 1949-51 average compared with 86 percent for 1937-39 average.

	Exports Valued in 1000 LE.			
Commodities	1937-39	1949	1950	1951
a. Cotton	28.840	106.089	149.756	164.100
b. Rice	1.051	14.442	7.645	14.539
c. Fruits & Veg.	1.291	1,598	2.375	1.776
d. Misc.Grains	409	1,252	649	1.619
e. Oils and Wax	315	187	627	200
f. Dairy Prod.	170	62	60	41
g. Other Agrl.Prod.	2.131	757	658	1.083
h. Agrl.Re-Exports	5	116	156	79
Total Ag. Exports	30.212	124.503	161.926	183.437
Percent Agrl.Exp.	85.8	90.2	92.3	90.3

2. Agricultural Imports: Imports of products supplementary to or interchangeable with those produced in Egypt amounted to LE.53,991,000 in 1951 as compared with LE.2,911,000 during 1937-1939. Egypt's increasing dependency upon imports of food and some other agricultural products is the result of increased population and increased emphasis which has been placed on cotton in recent years because of its favorable price position.

Commodity	Imports Valued in 1000 LE. 1937-39	1949	1950	1951
Grains & Products	235	18.381	21.440	39.441
Fruits & Veg.	776	2.484	3,365	5.547
Dairy Products	290	[illegible] 875	1.271	1.740
Sugar & Syrups	576	1.520	6.768	504
Other Supp.	1,034	2.728	3.637	6.754
Complementary Ø	2.136	13.610	14.588	15.940
Total Agrl.	5.047	39.598	51.069	69.931
Percent Agrl.	13.9	22.2	24.0	25.0

Ø Includes Coffee, Tea, Spices, Tobacco, Rubber, and other complementary.

Comment: During 1952, Egypt lost a large part of the advantage previously enjoyed as a result of declining cotton prices and the increased prices Egypt has been obliged to pay in cases where cotton has been bartered for wheat and other products. This decline in price of cotton deserves careful study in planning adjustments in Egypt's crop acreages in the future.

M. Major Agricultural Problem - Need for Increased Food Production: Egypt is confronted with an increasing food deficit due in part to a sharp decline in soil productivity and in part to a rapidly increasing population.

The decline of soil productivity in Egypt has been caused by: (1) the shortage of chemical fertilizers during and following World War II; (2) the increase in perennial irrigation which permits all-year cropping; and (3) the lack of adequate land drainage. The 1952 Annual Report of the Agricultural Attache, American Embassy, Cairo, points out that the decline in acre yields since pre-war is equivalent to the loss of 600,000 feddans. Decreased productivity of the land is shown by the data in the following table:-

Composite Yields Per Hectare

Years	All Crops 100 Kgs.	Pct.	100 Kgs.	Pct.	100 Kgs.	Pct.
1935-39 Av.	22.87	100.0	16.97	100.0	25.22	100.0
1951	20.29	88.7	13.86	81.7	23.19	91.9
1952	20.81	91.0	16.42	96.8	22.81	90.4

Even though Egypt is still largely self-sufficient for its food supplies, the production of cereal grains and sugar is no longer sufficient to cover local needs and large quantities are imported each year. In April 1953, Egypt signed a new three-year international wheat agreement, under which the annual wheat purchase is scheduled as 400,000 metric tons. This annual purchase of approximately 14,700,000 bushels will cost $22,785,000 calculated at the minimum price of $1.55 or $30,135,000 figured at the maximum of $2.05 per bushel.

2. Fayoum Province: has a total area of 433,153 feddans, of which almost seventy-two (71.7) percent is recorded as cultivated land. In this province, reclamation proposes to put water from the Nile River on a considerable acreage of desert land, south and west of the area presently irrigated. A visit to the area proposed for reclamation emphasizes two points: (1) a detailed soil survey and land classification is highly essential; and (2) assurance must be given that adequate water will be available for irrigation, because there are indications of water shortage for crops on the west side of the present irrigation project.

   Land on this province has adequate slope, hence, it is not anticipated that drainage will be a significant problem.

3. Note: An analysis of the data presented in B-Population, and C-Productive Land Available, above, - it is interesting to note that the cultivated land per capita is approximately 0.58 in Beheira Province and 0.46 in the Fayoum Province. This is well above the national average of 0.28 feddans per capita, indicating that neither of these provinces are as densely populated as some other parts of Egypt.

D. Principal Sources of Agricultural Income: The acreage of various crops reported for the Beheira and Fayoum Provinces provide some interesting and informative comparison.

Crops	Beheira Acres	Beheira %	Fayoum Acres	Fayoum %
Winter Crops	505,846	46.2	244,800	47.7
Wheat	146,983	13.4	106,004	20.6
Beans	48,939	4.4	13,370	2.6
Barley	34,818	3.2	3,521	0.7
Fenugreek	3,175	0.4	4,980	0.9
Flax	1,719	0.1		
Onions	1,757	0.1	883	0.2
Lupines	211		475	0.1
Chick peas	100			
Berseem	255,062	23.3	113,982	22.2
Vegetables	11,526	1.0	904	0.2
Others	1,556	0.1	581	0.1
Summer Crops	344,021	31.5	119,472	23.2
Cotton	245,286	22.4	96,874	18.9
Rice(Summer)	61,268	5.6	5,207	1.0
Millet(Summer)			10,278	2.0
Maize(Summer)	6,509	0.5	17	
Sugar Cane	897	0.1	450	0.1
Ground Nuts	2,281	0.2	715	0.1
Sesame	3,069	0.3	140	
Melons	9,602	0.9	2,184	0.4
Vegetables(Summer	17,685	1.6	2,130	0.4
Others	3,668	0.3	175	
Nile Flood Crops	243.490	22.2	149.534	29.1
Maize	220.961	20.2	96,036	18.7
Millet	7		36,818	7.1
Rice			12,014	2.3
Vegetables	20,900	1.9	4,053	0.7
Others	1,622	0.1	613	0.1
Grand Totals	1,093,357	99,9	513,086	100.0

Note: Berseem, cotton, corn and wheat are the principal crops occupying eighty (80) percent of the reported crop area in each province.

In each province, berseem occupies twenty-two (22) percent or more of the crop acreage. Significant amounts of rice and beans are grown in the Beheira Province, while in the Fayoum millet is an important secondary crop.

Cotton and wheat are the principal cash crop for the fellaheen in each of these Provinces. Because Egyptian cotton must compete on world market with cotton grown in other surplus producing areas, the maintenance of the cotton acreage at present high levels is open to serious question. A decrease in the cotton acreage in favor of increased plantings of wheat corn

and rice in the Beheira Province and wheat, corn and millet in the Fayoum Province appears to be a sound procedure. An increase in the production of livestock feeds for intensive milk production appears justified.

E. Water Problems: There are definite indications that both the Beheira and Fayoum Provinces are confronted with a shortage of water to irrigate the land now being cropped. This has special significance in view of the fact that plans are being prepared to reclaim and develop additional land for crop production in both provinces; increasing the capacity of canals by cleaning out vegetation and dredging to provide increased width and depth would aid in more rapid and efficient delivery of water. A revision of the irrigation cycle might reduce the tendency toward over-irrigation.

1. Beheira Province Soil and Water Problems: In the Beheira Province, the land has very little fall, in fact, parts are below sea-level, hence, much of the farm land now in use will profit from improved drainage. The soils are deep, generally heavy, and more or less saline. Reclamation is largely a problem of drainage followed by beaching to reduce the salt content of the soil.

2. Fayoum Province Soil and Water Problems: The Fayoum Province has considerable gradient and except for one small area, drainage is not a problem. The water system is reported to be the most perfect in Egypt; over-irrigation is not a problem, and water consumption per feddan is less than for other provinces.

F. Nutrition and Sanitation Problems appear to be quite similar to those for Egypt as a whole. More adequate drainage, especially in the Beheira Province would improve the sanitation and health conditions in addition to increasing the productivity of land now in cultivation.

The Beheira Province has almost twice as many people as the Fayoum Province yet the acreage of vegetables is seven (7) times greater. No doubt the proximity of the Alexandria market makes vegetable production more remunerative in the Beheira Province. Nutrition and health standards could be improved by increasing the production and consumption of vegetables by farm families in both Provinces.

III Recommendation For Increasing Agricultural Production:
After careful evaluation of suggestions for use in the Beheira and Fayoum Provinces in demonstrating the possibilities of improving the social and economic conditions throughout all Egypt, it is apparent that the major responsibility of the agricultural phase of the EARIS PROJECT is to encourage the Government of Egypt to emphasize the more general use of improved agricultural practices and procedures designed to increase the production of agricultural commodities, with primary emphasis on increased production of human foods.

In view of the tremendous and rapidly increasing population pressure on the limited land resources now available for crop production, and the rather slow rate at which additional land resources can be reclaimed and developed, it is imperative that the cooperative program of community development and rural rehabilitation should emphasize every possible practical opportunity for increasing the productive capacity of land already in cultivation. In support of this contention, attention is directed to a few potentials: (1) if one-half of the total wheat acreage of the Beheira and Fayoum Provinces should be planted to Giza 139, a new rust resistant wheat in the fall of 1953, the increased yield in 1954 over varieties now in use would be approximately 700.000 bushels. This increased wheat production would be the equivalent of adding about 20.000 acres of new land, almost exactly the amount scheduled for reclamation in the Beheira Province during the 5 year period, 1953-1958. With the entire acreage of wheat in the two provinces planted to Giza 139 in the fall of 1954, the total increase in wheat production in 1955 would approximate 1,400,000 bushels, or the equivalent of adding about 40,000 acres of new land. This comparison is not intended to depreciate the need for reclamation but instead, it emphasizes that improved agricultural production on land already under cultivation is a worth-while and realistic objective. Further, this type of increased crop production can be accomplished without allocating additional water for irrigation and generally with a minimum of increased production costs.

Two other examples will further emphasize the value of wider application of improved agricultural practices; assuming that commercial fertilizer could be applied to over-half the present cotton acreage of the two provinces, the same total amount of cotton could be produced on approximately 43,000 acres less land, thus making this land available for the production of wheat. Again, when it is possible to plant the present maize acreage in the Beheira and Fayoum Provinces to seed of hybrid maize, (Summer, 1955), the production of maize will be increased by over 67,000 metric tons - the equivalent of the production from 80,000 acres of new land.

It is believed that increased production of agricultural commodities in the Beheira and Fayoum Provinces can be accomplished most effectively by (1) expanding and accelerating the projects in the present program cooperative between the Government of Egypt, Ministries of Agriculture, and War and Marine and the Government of the United States of America, Technical Cooperation Administration; and (2) through the EARJS Project to encourage the Government of Egypt to initiate and implement other lines of agricultural work for which heretofore, no funds have been available. Cooperative technical assistance on several pressing problems can shorten the interval necessary to restore crop yields to pre-war levels at a minimum of cost, and the increased returns will have a prompt and favorable impact on the fellah and his family.

Note: The following recommendations are offered without any effort to arrange or suggest priority:

A. Adoption of Improved Agricultural Practices is recommended as a means of making adjustments better to fit Egypt's environment and the needs of the fellah, and to provide environment conditions more favorable to increased production.

1. Increased Use of Pure Seed of Improved Varieties of Adapted Crops will produce substantial increases in yields of food and fiber quickly at a minimum of cost. Giza 139, a rust-resistant wheat, developed by the Plant Breeding Section, Ministry of Agriculture cut-yields existing varieties by one ardeb (5.5 bushels) per feddan.

   There are about 50.000 ardebs (275,000 bushels) of seed of Giza 139 available for planting in 1953 for the 1954 crop. It is recommended that the Ministry of Agriculture be encouraged to allocate sufficient seed of Giza 139 to the Beheira and Fayoum Provinces to plant the entire wheat acreage to this new wheat during the next three years - 1953, 1954, and 1955. Based on the present total acreage of wheat in the two provinces of approximately 253,000 feddans, seed would be required for about 84,000 feddans each year. At the rate of 2.4 bushels planted per feddan, 201,600 bushels would be required each year or almost 605,000 bushels during the three-year period. The extra yield obtained from Giza 139 is 5.5 bushels per acre, thus the calculated advantage of using this new wheat on 253,000 feddans would amount to approximately 1,400,000 bushels.

   Fortunately, the Ministry of Agriculture has land, seed cleaning equipment, storage facilities and technical personnel at the Sakha Station in the Lower Delta for producing and distributing superior seed stocks of cotton, wheat, barley, rice, beans and berseem, all of which are important crops in the Beheira Province. These facilities should be used to full capacity for furnishing superior seed to the fellaheen on a basis determined jointly by the Co-Directors.

2. Extending the Use of Hybrid Maize: Maize, in the form of bread, is a staple food for more than 13 million farmers. During 1951 and 1952, maize occupied 18.9 percent of the total crop land area in Egypt, with a total production of 1,463,600 metric tons. Yet, during 1949-51, Egypt imported annually 800,000 ardebs (4,400,000 bushels) of maize, valued at LE.5,000,000 (approximately $14,000,000).

Egypt has amply demonstrated that hybrid maize will increase the total production by 25 percent. If planted on Egypt's entire acreage of maize (705,450 hectares or 1,743,167 acres) the increased production would be 365,900 metric tons or 14,374,643 bushels. Full use of hybrid maize in Egypt would eliminate corn importations, saving LE.5,000,000 ($14,000,000) and reduce wheat imports by 2,200,000 ardebs (12,100,000 bushels), saving LE.14,080,000 ($25,344,000).

It is estimated that hybrid seed planted on the present acreage of maize in Egypt would increase the returns per acre by LE.5 ($14). This would increase the national income by LE.8,715,000 or $24,400,000 annually.

As a start toward a more conclusive demonstration of the value of hybrid maize, two recommendations are proposed:-

a. For 1953: Demonstrations involving three hybrids and the locally adapted open-pollinated variety in each of the two provinces, the number of these demonstrations to be determined by the seed available.

b. For 1954: (1) Continue and increase the number of demonstrations (Seed supplies should not be a limiting factor). (2) Encourage Ministry of Agriculture to allocate 25 percent of their prospective 20,000 bushel (?) production of hybrid maize seed to the Beheira and Faycum Provinces. In case Ministry cannot supply, requisition 5000 bushels of hybrid maize seed from the United States. (At present, there is an embargo on US double cross seed).
(3) With approval of the Ministry of Agriculture, initiate the production of hybrid seed by at least two producers in each province. United States or Egyptian single crosses should be available.

c. For 1955: With three possibilities working, (1) Imports of U.S.double cross seed; (2) production by selected Egyptian private operators, seed should be available to plant 50 percent of the total maize acreage to adapted hybrids.

3. Improved Crop and Soil Management, Including Fertilizers: The Agricultural Attache, American Embassy, Cairo, Egypt, has indicated that the decline in yield of all crops in Egypt from pre-war averages is equivalent to the loss of 600,000 feddans of productive farm land. This decline in soil productivity has been caused by (1) the shortage of chemical fertilizers during and following World War II; (2) the increase in perennial irrigation and year-round cropping, and (3) excessive use of water causing wet water-logged soils and loss of fertility.

It is recommended that four major crops - Maize, Wheat, Rice and Cotton, be selected for an intensive extension education program to obtain wider use of improved crop and soil management practices, including the application of commercial fertilizers in combination with animal manures, in so far as the latter may be available; the planting of new deep-rooted soil building crops; better utilization of existing supplies of organic matter to improve the physical condition of the heavier soils, etc. Besides emphasis by extension specialists of improved crop and soil management practices, short term credit at reasonable rates of interest must be made available to help finance desired activities.

Egyptian agriculturists, both government and private report that it is reasonable to expect increased yields of crops up to thirty (3) percent from the adoption of improved practices, such as planting improved seed of adapted crop varieties, application of chemical fertilizers, and improved drainage.

4. Improvement of Irrigation Practices: From reports and observations relating to the Beheira Province, it is apparent that availability of "free water" for perennial irrigation results in excessive amounts being used, causing decreased yields from leaching of soil nutrients and poor physical and biological conditions resulting from high water table. In this Province, there are possibilities for improving water distribution facilities and practices. It is suggested that the Irrigation Department, Ministry of Public Works make an examination of the benefits that might result from revising the system of water rotation. Enlargement of certain canals to provide more adequate water supply for land already under cultivation also is a responsibility of the Ministry of Public Works which requires attention.

In the Fayoum Province, it is reported that there is little if any excessive use of irrigation water. However, in both the Beheira and Fayoum Provinces, as well as in Egypt as a whole, an intensive program of extension education and demonstrations by irrigation technicians to obtain more general adoption of improved irrigation practices can be very effective in increasing the production of crops.

5. Improved Drainage of Farm Lands: Perennial irrigation has led to excessive use of water and decreased yields of crops. Officials of the Government of Egypt estimate that 2000,000 feddans of land in Egypt now need improved drainage, and that correction of the unfavorable conditions resulting from poor drainage would increase crop yields by an average of twenty (20) percent. (This represents the equivalent of the production from 400,000 feddans of land).

Improved drainage is of minor importance in the Fayoum Province, but in the Beheira Province, where the gradient is slight, and part of the land is below sea-level, drainage is a problem deserving primary consideration. The following suggestions are applicable to the Beheira Province:

a. Outlet Ditches: Preliminary estimates for the Beheira Province by the Inspectorate of Lower Egypt Projects, Ministry of Public Works indicates approximately 300,000 feddans need deeper and improved outlet ditches.

b. Field Drainage: In the Beheira Province, there is need for field drainage on an estimated 30,000 feddans, mostly in small holdings where it is difficult to install open ditches between contiguous owners. Surveys may show an even greater need.

The type of field drainage considered most applicable is underground tile. Its use eliminates open ditches, thus permitting additional land to be cropped and improving conditions for mechanization of certain farm operations. Where adapted, it is estimated that increased crops from tile drainage should pay for the improvements in three to five years, (based on records of increased returns in Menufia Province at LE 5 for corn; LE 20.8 for cotton, and LE.12.5 for wheat).

c. Well Pumping: A project agreement on accomplishing drainage by well pumping has been signed with the Ministry of Public Works. This project proposes to install one to three experimental wells in Southern Beheira Province to test the feasibility of pumping from the underground as a means of providing drainage. If successful, drainage wells might be preferable to tile drainage, since it would supply additional water for irrigation.

6. Encouraging Increased Production of Vegetables for Family Use: Each farm family should be encouraged to raise sufficient vegetables for home use as a contribution to improved nutrition and better health. Beans, beets, carrots, cucumbers, tomatoes and leafy green vegetables are easily grown and provide essential vitamins and minerals. Any surplus vegetables should find ready sale in the village through the social center, cooperative, etc. In the Behoira Province, there is a demand for more vegetables.

7. Increase the Production of Poultry and Eggs: Up to 1932, Egypt was second only to Denmark as an exporter of eggs to Great Britain, averaging over 200 million eggs annually. By 1939, the exports were down to 20 million eggs. In 1944-45, Egypt produced 1.053 million eggs. In 1949-50, egg production totalled only 455 million, or only 22.7 eggs per capita. (The per capita consumption in the U.S. in 1946 was 45 eggs).

   By encouraging the fellah to produce improved poultry under more up-to-date management, the diet for his family could be improved, and sales of surplus products over and above family needs would provide funds for purchasing other essential needs.

   Replacement of local chickens in a few carefully selected villages with improved poultry (baby chicks) combined with improved management especially to reduce loss through diseases, would be an effective demonstration of possibility of increasing the production of an important and essential item of the diet of the fellaheen.

8. Improved Breeding and Management of Livestock: For centuries, the cattle of Egypt have been tri-purpose animals: work, meat, and milk. Livestock productivity is low, chiefly because it is not an objective in itself but instead is a subsidiary to crop production. Low productivity of meat and milk may be attributed to (1) the almost universal use of milking animals for draft purposes; (2) inadequate feeding; (3) losses due to insects and diseases; and (4) lack of selection and breeding to increase the production of either meat or milk.

The Ministry of Agriculture reports that the use of milking animals for work reduces the production of milk fully one-half. Based on an estimated total production of almost three (3) billion pounds of milk from cows and gamoosa in 1952, the potential production possible through improved feeding and amangement would be substantial. The use of proven pure-bred sires from high producing cows on the native "Baladi" cows has almost unlimited possibilities for increasing both milk and meat. After 25 years of breeding and selection using only native Egyptian heifers and cows mated to pure-bred Jersey Bulls, the Assyout College in Egypt has developed a dairy herd which produce more than twice the milk obtained from native cows fed and managed in an identical manner.

Many farmers of Egypt do not have the resources to own and maintain a dairy cow, but do own goats, kept for both milk and meat. Improvement of the Egyptian goats for milk production for family use is worthy of attention.

9. Rabbits and Bees as a Source of Food: Under proper management, both rabbits and bees produce acceptable supplies of human feed. Rabbits provide meat at a very reasonable cost because of year-long crop season and the availability of home-grown feeds.

In locations where flowering plants are available in succession, bees produce an abundance of acceptable food at a moderate cost.

Bee-keeping and rabbit production are activities at which women and children can be quite successful especially with some technical help from agricultural extension specialists.

10. Improvement of Fisheries: The demand for fish far exceeds the supply. Fifty percent of the present supply is obtained from 750,000 acres of Delta and shore lakes; another ten to fifteen percent from the Nile River, sweet water canals and basins, while the remainder comes from the Mediterranean Sea and the Red Sea.

Lake acreage now producing fish is expected to be reduced almost proportionately to new land reclamation in the north delta area. This trend when completed is expected to decrease the total national fish harvest by about fifteen percent. In the Beheira Province in particular, nearly all new farm land will come at the expense of decreased fisheries production unless alternate fisheries resources are developed.

The overall problem is to expand and diversify the Egyptian fisheries to increase the availability of fish for human food and to provide protein for livestock feeds. Through cooperation with the Ministry of War and Marine, several potentials appear possible, including (1) development of fish farms; (2) improvement of fishing in Gulf of Suez; (3) development Mediterranean Sea Fisheries; and (4) development of sponge

fisheries and similar industrial marine products.
Note: In developing plans for land reclamation in the Lower Delta, the number of farm families proposed for resettlement should be kept in balance with the number of families who now derive their living from fishing and who will be deprived of that source of income. Here a very specialized form of agricultural extension will be required to convert these men from the skills of fishing to the skills of agriculture. This is a matter for careful consideration in selecting settlers.

11. Encourage Tree Plantings for Fuel, Lumber and Wind Breaks: Egypt is entirely without natural forests, consequently, the shortage of wood in all forms is acute. Importations for wood and wood products into Egypt are abnormally high, amounting to an estimated LE.11,000,000 annually (over $30,000,000). Consideration has been given to a tentative program to establish tree plantings in the following areas:

a. Coastal strip along Mediterranean	-	125,000 A.
b. Canal Zone and along Nile River	-	25,000 A.
c. Village forest and fuel areas	-	10,000 A.
d. Fayoum area, N. W. of oasis	-	1,000 A.
e. Banks of roads and canals		
f. Windbreaks west side Nile River		

12. Release Land For Human Foods By Decreasing The Surplus of Work Animals: Experienced Egyptian agriculturists estimate that 10 draft animals are required for the work to be performed on 100 feddans, or one animal for each 10 feddans. Remembering that forty-six (46) percent of the cultivated land in 1949 was held in units up to 10 feddans in size, and that thirteen (13) percent of the cultivated land involving two (2) million families was held in properties of less than one feddan (ave. 0.4 feddan), there appears to be ample justification for the claim that there is a significant surplus of animal power. A.J. Schwantes, T.C.A. farm machinery consultant in Egypt has estimated that 500,000 draft animals are sufficient for actual needs whereas, approximately 1,500,000 draft animals are available, over and above the tractors that are now in use. This means that the farmers of Egypt are feeding 1,000,000 draft animals which are surplus to actual requirements. The feeds consumed by the surplus draft animals require the use of 750,000 feddans of productive land. In the face of extreme need for increased production of human foods, this is an extravagance which Egypt cannot afford. Every effort should be made to encourage the fellah to canvas his need for work animals and reduce the number to actual requirements. For each cow or gamoosa that can be eliminated, three-fourths of an acre will be released - enough land to produce human food for a family of seven. Establishment of machinery cooperatives, with tractors and other equipment adapted to small tracts of land available at reasonable rates for custom work might be a partial solution to this problem.

13. Increased Mechanization of Farm Operations: The availability of cheap labor, the large number of very small farms, and the methods of irrigation and drainage have been important factors in delaying the more general use of agricultural machinery. However, the fact that in 1952, 9500 tractors were reported in use in Egypt means that a start has been made. Most of these tractors are in use on the larger farms.

On some farms, tile drainage has eliminated most of the open drains, thus making it possible to form larger tracts or fields. On other farms, the irrigation system has been revised to reduce the barriers to theuse of machines. An illustration of efforts to use machines in spite of small farms, is the village in Beheira Province in which the farmers have formed a voluntary cooperative which permits "Cooperative" crop rotations, through which it is possible to consolidate the plantings of the principal crops into larger fields, thus making possible the use of more tractor-power equipment.

From past experience, mechanized equipment can be used in such as plowing, land-levelling, threshing, ditching, and pumping, - even on relatively small farms. The use of mechanized power for this work makes it possible to relieve the animal of the necessity of working, but will not result in a disastrous replacement of labor. Later, mechanization can be extended appropriately to such operations as planting, cultivating, and harvesting.

B. Reduce Production Losses Due To Diseases, Insects and Weeds By Increased Use Of Modern Protective and Preventive Measures: Substantial losses of agricultural commodities result from diseases, insects, and weeds. It is not uncommon for smuts to reduce the yield of wheat by 10 percent. Rusts are so serious that a special wheat breeding program is required to develop rust resistant varieties. New wheat varieties in prospect promise as much as one ardeb (5.5 bushels) more wheat per acre than varieties currently available. Livestock and poultry diseases and parasites cause heavy losses of important human foods.

Through a systematic program of agricultural extension education and demonstrations, farmers could be encouraged to make more general use of insecticides, fungicides, and herbicides, thus reducing heavy losses of important agricultural commodities.

C. Improve Processing and Marketing Procedures: In general, efficient processing and marketing are restricted to the more important exportable cash crops, especially cotton, rice, and onions. However, many crude practices still are in use, especially in marketing products consumed locally, which result in considerable unnecessary waste of food. Items requiring attention include among others:-

1. Storage of Bread Grains: Improvement of grain storage in Egypt has been disappointinly slow. Under present storage conditions, grain is subject to admittedly large losses caused by (a) insect infestation; (b) action of rain and ground water; (c) rodents; (d) birds, and (e) theft. The Ministry of Agriculture reports that over a 5-year period stored-grain insects cause a loss of over 5 percent of the entire wheat crop - 65,800 metric tons (2,412,666 bu) valued at LE.1,300,000. ($3,640,000). Other admitted losses amount to LE.65,000 or a total annual storage loss of LE.1,365,000.

   There are not only the actual losses mentioned above, but on occasions, wheat released from storage, especially from "shounas" reaches the flour mills in very unsatisfactory condition.
2. Marketing of milk, meat, etc.
3. Grading, packing, and transporting fruits and vegetables.
4. Handing livestock from farms to markets.
5. Refrigeration and cold storage.
6. Improve Farm-To-Market Roads: The Ministry of Agriculture in reporting to the F.A.O. Middle East regional meeting in Cairo in 1948 stated:-
   "It seems in the best interests of the country to cut down on the number of pack animals, horses, donkeys, and mules, which represent over 20 percent of the total number of livestock. ---Bad roads and a shortage of mechanical transport --- are responsible. Should the number of pack animals be reduced more meat and milk could be produced by raising more cattle."
7. Improve the effectiveness of agricultural cooperatives. Egypt has provisions for organizing Agricultural Cooperatives at the village levels, to serve the fellaheen in various ways. There are indications that these cooperatives need to be studied carefully and possibly in some instances assisted in re-directing their programs of services to enable them to function more effectively. Seminars and training schools for the managers and boards of directors should be helpful. Useful services performed by Agricultural Cooperatives in Egypt include:
   a. Credit cooperatives; seed, fertilizers, equipment.
   b. Service cooperatives; spraying, plowing, packing, transportation.
   c. Buying cooperatives; supplies, etc.
   d. Cooperatives for rotation cropping to aid mechnization.
   e. Note: For additional information on agricultural cooperatives in Egypt, refer to a detailed report prepared by Paul Fankhouser, consultant on Agricultural Credit and Agricultural Cooperatives, T.C.A. Task Force, assigned to Egypt.

D. Provide Agricultural Credit Adapted to the Needs of the Egyptian Fellaheen: While the Government of Egypt has provided the Agricultural Credit and Cooperative Bank to provide funds for financing farm operating expenses, there are indications that credit is not as readily available to the Fellaheen as was anticipated.

It is recommended that the credit needs of the Fellaheen in the Beheira and Fayoum Provinces be studied and that in so far as possible the loaning policies of the Agricultural Credit and Cooperative Bank be adjusted to more adequately meet these needs.

Note: For additional information on Agricultural Credit, please refer to a detailed report prepared by Paul Fankhouser, consultant on Agricultural Credit and Agricultural Cooperatives, T.C.A. Task Force assigned to Egypt.

IV. Implementation of Proposals For Increased Agricultural Production enumerated in III above will require a vigorous effective program of agricultural extension, supported by up-to-date agricultural research.

A. Develop a National Agricultural Extension Service, entirely free of inspection, regulatory and law enforcement responsibilities. There is a wide gap between the very small minority of scientific, technical, and political leaders and authorities at the top of the national pyramid and the great masses of deprived fellaheen at the base. The distance between the two groups, both economically and socially, is great, and the means of effective communication is sadly lacking. Effective comprehensive extension education in agriculture is an urgent need. In fact, the achievement of the objectives of an accelerated program of community development and rural rehabilitation in the Beheira and Fayoum Provinces as a demonstration for the whole of Egypt largely will be accomplished only through a comprehensive and coordinated program of extension education and demonstrations which reaches the fellaheen.

1. Organization: While the Government of Egypt has many of the elements essential to the development of a National Agricultural Extension Service, they have failed to recognize the importance of taking immediate action in establishing a "department" or at least a "section" in the Ministry of Agriculture with a staff devoting full time to extension, and to coordinate the resources of the various Ministries that are now or could be used to advantage for agricultural extension. The National Production Council is urged to recognize these problems and the potentialities and to encourage the development of a national organization for agricultural extension service along the following lines:-

National Level - Cairo

(1) National Director: Appoint a National Director of the Agricultural Extension Service, to be free to devote full time to extension, to be responsible only to the Minister of Agriculture or his Under-Secretaries, and who will be responsible for co-ordinating the over-all program of agricultural extension in Egypt, including the Beheira and Fayoum Provinces.

(2) National Subject Matter Specialists: One for each section or subject - matter field; each responsible for supervision and coordination of efforts of Province subject - matter specialists.

b. Province Level: Egypt is divided into fouteen (14) provinces, each with a "capital". It is proposed that eventually each Province would be supplied with
   (1) Province Supervisor: Responsible for supervision and coordination of the work of subject-matter specialists assigned to the Province and the Agricultural Agents located in the various Markaz of the Province.
   (2) Province Subject-Matter Specialists: To be responsible for assisting with subject-matter education of the fellaheen in the several markaz.

c. Markaz Level: Each province is divided into several markaz. It is proposed that one Extension Agent be employed to serve the Fellaheen in each Markaz, with additional personnel to be added as needed. It is essential to have a farmer committee to help plan a progress adapted to actual needs.

d. Note: Whereas in normal situations, one extension agent with possibly a limited number of assistants is considered sufficient to handle the educational phases of the agricultural extension program in a markaz, closer supervision is desirable in newly settled reclaimed areas. Therefore, for the first three years after settlement, enough agents should be available to provide adequate information, and to a limited extent supervision to individual families.. The number of agents necessary will be determined by experience as the project develops. It has been suggested that one extension agent to each 200 to 300 farm families may be required.

2. Physical Facilities: Fortunately, Egypt has excellent physical facilities capable of being adapted to and organized for effective agricultural extension service.
   a. Ministry of Agriculture has established fifty (50) agricultural centers, of which five (5) are located in the Beheira Province and four (4) in Fayoum.
   b. Ministry of Social Affairs, through its Fellah Department, has established one hundred fifty (150) social centers with an agricultural graduate in charge of each. Sixteen (16) social centers are located in Beheira Province, and six (6) in Fayoum.
   c. Ministry of Health has set up several health centers distributed in Provinces throughout Egypt.
   Note: Counting only the Agricultural and Social Centers, the Beheira Province has a total of 21 centers and Fayoum Province 10 centers available, from which agricultural extension education and demonstrations could be conducted. Most of the present personnel employed at these centers are already doing extension work, although at present without effective National coordination.

3. Personnel: To be effective, extension personnel must have a background of actual participation in year-long farm activities, should have some academic training in agriculture, and must be willing to live in the communities and have a deep and abiding interest in the Fellaheen and their problems.

Unfortunately, experienced personnel, trained in agriculture and indoctrinated in extension methods and philosophy, with heavy emphasis on the importance of serving Egypt by service to the fellaheen is the "bottle neck". To meet the demands of an enlarged program of agricultural extension and demonstration, it is suggested that G.O.E. and T.C.A. undertake:-

a. Short-term Training of Extension Personnel under a plan similar to that in operation in Iran. A team of experienced extension leaders and specialists from the USA is detailed to the host country to conduct intensive on-the-job training for a period of three months for local personnel, selected because of their potential qualifications for reaching the fellaheen with up-to-date information and improved techniques. Most of these trainees for positions as rural advisers or extension agents should be selected from the villages. They should have the benefit of practical farm experience with no feeling of "losing caste" by actually working with those who till the soil,

b. Establish Curricula in Agricultural Extension: in one or more of the Egyptian Universities. This long-term training would provide personnel for specialist positions in Poultry, vegetable production, Dairying, Agronomy and Soils, Irrigation, etc. etc.
   (1) Cairo-Fouad I University.
   (2) Cairo-Ibrahim University.
   (3) Alexandria-Farouk University.

B. Reorient and Strengthen Agricultural Research: There is urgent need for both applied and basic research in agriculture and related aspects of rural life to provide a continuous flow of sound, factual information for the agricultural extension staff. Continuous research has no substitute in the solution of agricultural problems. In Egypt, scientific research in agriculture has been rather firmly established. However, to aid in implementing the cooperative program of community development and rural development in the Beheira and Fayoum Provinces and demonstrating its application to Egypt as a whole, it will be necessary for the Ministry of Agriculture to evaluate its entire program of Agricultural Research and re-direct the efforts of the research staff more effectively to meet present-day problems of the Egyptian Fellaheen.

1 Organization of Agricultural Research: Egypt has many of the elements needed for effective agricultural research. These elements could be used more effectively with proper coordination and delegation of responsibility. The Agricultural Research staff should be entirely free of inspection, regulatory, and law enforcement responsibilities.

a. National Level - Cairo: At the national level, the organization for agricultural research should provide for:-

(1) National Director, Agricultural Research, who will be responsible for coordinating the various segments of the nation-wide program of investigations.

(2) National Supervisors: One man should be selected to coordinate and supervise the research in each of the broad subject-matter fields, as - Agricultural Chemistry; Agricultural Economics; Agricultural Engineering (Farm Equipment); Animal Industry; Agronomy (Field Crops); Dairy Industry (Production and Manufacture); Drainage and Irrigation; Entomology: Home Economics and Human Nutrition; Horticulture, Plant Pathology; Poultry; Soils; Veterinary Science, possibly others.

b. Province Level: Insofar as possible, research personnel should be decentralized to the province level, with assignments at agricultural experiment stations where they can maintain reasonably close contacts with the fellah and his problems.

(1) Station Research Supervisor: One research supervisor is suggested for each agricultural experiment station, who will be responsible for coordinating the efforts of the research personnel attached to the station, and answering to the National Director of Agricultural Research in carrying out that stations contributions to the country-wide program of agricultural research.

(2) Station Research Specialists: It is suggested that each agricultural experiment station be staffed with research specialists capable of performing the various scientific investigations which are made a responsibility of that station in the country-wide agricultural research program. In addition to the usual qualifications required for agricultural research, these specialists should have an interest in and understanding of the fellaheen and their problems if they are to render maximum service to agricultural improvement of Egypt.

2. Physical Facilities, Equipment and Personnel: Time did not permit a study of all of the facilities available for agricultural research in Egypt by any one individual. However, by combining the impressions and reactions of several individuals who have visited different units of the present system for agricultural research, it is possible to offer suggestions pertaining to physical facilities and equipment and personnel.

a. Physical Facilities and Equipment: There appears to be a tendency of the Government of Egypt to put too much money into buildings at the agricultural experiment stations and too little into equipment for either applied or basic research, especially the latter.

In a few instances, agricultural experiment stations are being operated as "show places" with entirely too little emphasis on research of value to the fellaheen.

b. Personnel: If research is to be effective in improving the agriculture of Egypt, the entire research personnel must recognize the fact that the country-wide program of investigation and research should be designed to solve the problems of the fellaheen, because the welfare of the whole of Egypt largely is dependent upon the efforts of the people who till the soil.

There is an impression that in Egypt, too many research workers are so isolated from the land and the problems of the fellaheen that they are unable to render effective service in improving Egyptian agriculture or to make significant contributions toward improved living conditions for the 15 million people who reside on the land.

3. Types of Research: In Egypt, there is need for two types of agricultural investigations, namely:-

a. Applied or Practical Investigations or pressing problems where results are needed quickly and without delay.

b. Basic Fundamental Research to obtain underlying or basic principles bearing on the solution of agricultural problems. A substantial body of knowledge accumulated through investigations conducted under local conditions is essential to the success of long-range programs of agricultural development.

C. Responsibilities of Egyptian Public: In addition to cooperative efforts between the Government of Egypt and the Government of the United States of America in the fields of Agricultural Extension and Agricultural Research, there are important projects which appear to be responsibilities for which the public as represented by the Republic of Egypt must accept leadership. As applied to the Beheira and Fayoum Provinces, and to Egypt as a whole, these include among others:-

1. Improvement of drainage outlet ditches.
2. Construction of drainage pumping station.
3. Enlargement and extension of irrigation canals.
4. Installation of underground tile drainage.
5. Improved distribution of irrigation water.
6. Maintenance of all canals and ditches.

Note: These activities are a responsibility of the Irrigation Department, Ministry of Public Works, However, because agriculture in Egypt is entirely dependent upon irrigation, there is need for close coordination between the Ministry of Public Works and the Ministry of Agriculture in planning and executing these activities.

V. Schedule of Implementation of Proposals For Increasing Production of Agricultural Commodities in the Beheira and Fayoum Provinces: In preparing the schedule of "A", "B", "C", and "D" below, an effort has been made to give priority to proposals which offer promise of producing substantial returns rather quickly.

A. Adoption of Improved Agricultural Practices:

1. Use of Pure Seed of Improved Varieties: It is recommended that the Ministry of Agriculture be requested to allocate sufficient seed of Giza 139 wheat, a rust-resistant variety, to the Beheira and Fayoum Provinces to plant the entire wheat acreage to this improved variety within three years.

a.

Time Schedule		1953	1954	1955
Beheira Prov.				
Acreage	-	49.000	49.000	49.000
Bushels Required	-	117.600	117.600	117.600
Fayoum Prov.				
Acreage	-	35.000	35.000	35.000
Bushels Required	-	84.000	84.000	84.000

b.

Estimated Benefits - Bu.	1953	1954	1955
Beheira Prov. -	269.500	269.500	269.500
Fayoum Prov. -	192.500	192.500	192.500
Gain in Bushels	462.000	462.000	462.000

c. Estimated Costs: It is recommended that the fellah be required to trade one and one-fourth bushels of his wheat for each one bushel of improved seed which he requires for planting. The funds resulting from the sale of the wheat collected from the fellaheen would offset in part the costs of the improved seed and its distribution.

Est. Seed Costs	1953-54	1954-55	1955-56
Beheira Prov.	$352,800	$352.800	$352.800
Fayoum Prov.	252.000	252.000	252.000
	$604.800	$604.800	$604.800

2. Extending The Use Of Hybrid Maize: It is recommended that an effort be made to plant seed of hybrid maize on one-tenth of the present corn acreage on each of the two provinces, during each of the next three years, planting as nearly as practicable according to methods and rates used in the corn-growing areas of the U.S.

a. Time Schedule

	1954	1955	1956
Beheira Prov.			
Acreage	23,000	23,000	23,000
Seed Required - Bu	3,800	3,800	3,800
Fayoum Prov.			
Acreage	9,600	9,600	9,600
Seed Required - Bu	1,600	1,600	1,600

b. Estimated Benefits: Assuming that corn yields in the Beheira and Fayoum were equal to the Country average of 1951 and 1952 (approx. 1900 lbs. per acre) and the crop from hybrid seed should be at least 25 percent higher, the increased yield from the hybrid seed planted on one-tenth of the maize acreage in the two provinces each year would amount to 15.5 million pounds or 7000 metric tons annually.

c. Estimated Costs: Since seed of hybrid maize is not yet available in Egypt in quantities, seed for 1954 would have to be imported from the United States. Estimates based on current prices plus transportation place the cost at $20,000. After 1954, the Egyptian Ministry of Agriculture and private growers should be able to supply the seed requirements from Egyptian stocks of seed of hybrid maize at a cost estimated at $16,600 annually.

3. Use of Chemical Fertilizers: It is recommended that an acreage of cotton be designated in each province, preferably on the better soil areas, to receive applications of commercial or chemical fertilizers, of the kinds and amounts customarily recommended by the agricultural technicians, Ministry of Agriculture.

a. Time Schedule

	1954	1955	1956
Beheira Prov.			
Acreage	5,000	5,000	5,000
Tons required	500 T.	500 T.	500 T.
Fayoum Prov.			
Acreage	2,000	2,000	2,000
Tons required	200 T.	200 T.	200 T.

b. Benefits Estimated: Assuming that cotton yields in the Beheira and Fayoum Provinces are equal to the country-wide average for 1951 and 1952, and that the application of chemical fertilizers can be expected to increase cotton yields by 20 percent (Ministry of Agriculture estimates 30 percent), the increase from fertilizing 7000 acres in the two provinces would amount to 1,680,000 pounds or 762 metric tons each year. If by the use of chemical fertilizers generally on the cotton acreage of these two provinces, it becomes possible to increase total production sufficiently to produce the present yield on one-fifth less acres, a total of 68,500 acres of cotton could be released for the production of food for human and animal consumption. At 30 bushels per acre, this acreage would produce slightly over 2 million bushels of wheat, a product always in demand in Egypt.

c. Estimated Costs:

	1954	1955	1956
Beheira Prov.	$45.000 ø	$45.000	$45.000
Fayoum Prov.	18.000 ø	18.000	18.000
Total:	63.000	$63.000	$63.000

ø Costs calculated basis $90 per ton for chemical fertilizers applied at 200 pounds per feddan.

4. Improvement of Irrigation Practices:

a. Proposal Explained: Present plans for reclamation in the Beheira Province include four units - 1120, 2000, 3880, and 13,000 feddans in size totalling 20,000 feddans.

It is highly important that as each unit is brought into production, a simple irrigation system including sprinkler irrigation be developed which will permit "cooperative" crop rotation and a maximum of mechanization of farming operations.

b. Timing

	1956	1957	1958
Tract Acreage	2000 Fed.	3880 Fed.	13.000 Fed.

c. Benefits: Planned cropping under irrigation is not new in the Delta. Cooperative cropping on a rotation basis in one village area in the Beheira Province has demonstrated that land preparation and irrigation can be greatly simplified and that yields can be increased.

d. Estimated Costs

	1956	1957	1958
Equipment	$20.000	$20.000	$20.000

(Anticipated that EARIS will supply necessary land preparation equipment and sprinkler irrigation equipment).

5. Improving The Drainage of Farm Lands.

a. Proposal Explained: The TCA Drainage Consultant reports that nearly 300,000 feddans in the Beheira Project need deeper outlet ditches, and in addition, 30,000 feddans require drainage by underground tile.

b. Timing

	1954-55	1955-56	1956-57
Outlet Ditches	100,000 A	100,000 A	100,000 A
Tile Drainage	10,000 A	10,000 A	10,000 A

c. Benefits: Ministry of Agriculture estimates that improved drainage will increase productive capacity of crop lands by 20 percent.

d. Estimated Costs

	1954	1955	1956
Outlet Ditches (LE.5 per A)	$1,400,000	$1,400,000	$1,400,000
Tile Drains (LE.20 per A)	$ 560,000	560,000	560,000
	$1,960,000	$1,960,000	$1,960,000

6. Encourage Vegetable Production For Family Use.

a. Proposal Described: To encourage more general production of vegetables by the fellah for family use, it is proposed that the Truck Crops Section, Ministry of Agriculture arrange to prepare and distribute small packets of each of the following vegetables; beans; beets; carrots; cucumbers; egg plant; lettuce and tomatoes, together with simple instructions in Arabic for their culture.

b. Timing

	1953-54	1954-55	1955-56
(1) Beheira Prov.	1000	1000	1000
(2) Fayoum Prov.	500	500	500

c. Estimated Benefits: Through this effort, it is hoped that more farm families can be encouraged to produce and consume more vegetables, thus contributing to better nutrition and health.

d. Estimated Costs: Because of the educational character of this proposal, it is suggested that these vegetable seed collections be distributed to the fellaheen without charge.

	1953-54	1954-55	1955-56
(1) Beheira Prov.	$1000	$ 1000	$ 1000
(2) Fayoum Prov.	$ 500	$ 500	$ 500
	$1500	$ 1500	$ 1500

7. Increased Production of Poultry and Eggs.

a. Project Described: It is proposed to place improved chickens in selected villages in the two provinces to replace present mixed breads.

b. Timing

	1954	1955	1956
Beheira Prov. (Villages)	1	1	1
Fayoum Prov. (Villages)	1	1	1

c. Benefits: Stimulate interest in raising better poultry and through educational work on better sanitation and disease control, reduce present heavy losses.

d. Estimated Costs:

	1954	1955	1956
Beheira Prov.	$80,000	$80,000	$80,000
Fayoum Prov.	$80,000	$80,000	$80,000
	$160,000	$160,000	$160,000

8. Improved Breeding and Management of Livestock with Special Emphasis on Dairy Cattle, Goats and Sheep: Notable progress in Dairy Herd Improvement has been made in Egypt during the past 25 years. Special mention should be made of the work done by the Animal Breeding Section, Ministry of Agriculture, and by Assyout College. Goats and sheep deserve more consideration in the agricultural economy of Egypt.

a. Proposal: (1) It is recommended that Jersey Bulls from high producing dams be purchased and placed at the 5 agricultural centers in Beheira Province and the 4 similar centers in the Fayoum Province. Service of these bulls to be made available to native cows owned by the fellaheen, with the agreement that female progery will be kept for breeding to bulls of similar quality kept at these centers, and that all male calves be castrated before six months of age; (2) it is recommended that 35 male goats being imported from the United States be distributed among the 5 agricultural centers of the Beheira Province, the service being made available to the baladi does of the fellaheen. The female progeny should be kept for breeding and the male progeny be be disposed of at a stipulated time. It is recommended

also that 50 head of high quality Angora sires be imported and used under the same management practices.

It is recommended that 20 head of high quality, strong pasterned Suffolk sires be imported to be used under the same management practices as outlined for goats.

b. Timing

	1953-54	1954-55	1955-56
(1) Bulls - Beheira	10	5	5
- Fayoum	8	4	4
(2) Goats - Beheira			
Milk Goats	34	-	-
Angora	50	10	10
(3) Sheep - Beheira	20	10	10

c. Benefits: By systematic use of high quality Jersey Bulls from high producing dams on native (Baladi) cows, Assyout College has developed strains of cows which produce more than twice as much milk as the unimproved Baladi cows managed in an identical manner. Goats and sheep respond equally well to judicious breeding.

d. Estimated Costs:

	1953-54	1954-55	1955-56
(1) Bulls - Beheira	$25,000	$10,000	$10,000
- Fayoum	$ 5,000	$ 2,500	$ 2,500
(2) Goats - Beheira			
Milk Goats			
Angora			
(3) Sheep - Beheira			
Total			

9. Encourage Production of Rabbits and Bees.

a. Proposal Described: Encourage leaders in one or more Agricultural Centers in each province to undertake work with women and children in the village to stimulate interest in producing more rabbits as a source of fresh meat for family use.

b. Timing

	1954	1955	1956
Beheira Prov.	1 Village	1 Village	1 Village
Fayoum Prov.	"	"	"

c. Benefits: Protein foods are short in the diets of farm families. Rabbits can be raised cheaply and will provide meat with a minimum of labor and expense.

d. Estimated Costs:

	1954	1955	1956
Breeding Stock For	$500	$500	$500
Each Province	500	500	500
Total	$1000	$1000	$1000

10. Improving Fisheries as Source of Food:

a, Proposal Described: Possibility of increasing food production by improving fisheries at an early date in Beheira and Fayoum Provinces appears to be limited to the construction of small family-type farm ponds on tracts of land of sub-marginal character for crop production. On small, family-type farm ponds intensive fish culture could be practiced insuring maximum production.

b. Timing

	1954	1955	1956
Beheiran Prov.	1 pond	1 pond	1 pond
Fayoum	"	"	"

c. Benefits: Demonstrate possibilities of applying intensive fish culture to family-type ponds as means of increasing food supply and increasing supplemental income from sub-marginal land.

d. Estimated Costs

	1954	1955	1956
Beheira Prov.	$5000	$5000	$5000
Fayoum Prov.	5000	5000	5000
	$10000	$10000	$10000

11. Encourage Tree Plantings:

a. Description of Proposal: Plant adapted tree species in form of wind-breaks on the road sides and along the banks of the larger irrigation and drainage canals on new reclamation projects in the Beheira Province which are ready for cropping.

b. Timing: As no T.C.A. forestry technician is available, G.O.E. forestry technicians should be encouraged to determine the extent of plantings deemed desirable (number of kilometers of roads, canals and drains); species that offer most promise; planting pattern to provide succession as certain species reach maturity; etc.

Beheira Province	1953	1955	1957
Feddans ready	1120	2000	3880

c. Estimated Benefits: Besides offering protection from winds, the wind-break plantings will provide fuel from quick growing species and lumber from larger species.

d. Estimated Costs: The Committe has no basis for estimating costs. Since part of the plantings are suggested for public roads, possibly the Nurseries Section of the Ministry of Agriculture could provide the planting stocks.

12. Increased Mechanization of Farm Operations.

a. Proposal Described:

1. Tractor and Machinery Station: To establish and operate on a demonstrational and experimental basis tractor and machinery stations - one for 1120 feddans in 1955 or '56. The stations should be equipped with the necessary machinery to perform all the work normally done by animals. Complete data should be obtained on all phases of operation and management to be used for the operation of similar enterprises by private individuals or cooperatives.

2. Unusual Practices: New and/or special machines and unusual farm practices to facilitate farm mechanization are to be tried; e.g. maize in rows, and irrigating without ridges.

b. Timing

	1953-54	1954-55	1955-56
Beheira	1 station		1 station

c. Estimated Benefits: Animals will not be needed for work, hence emphasis can be placed on milk production, with the possibility of doubling present milk production.

d. Estimated Costs:

	1953-54	1954-55	1955-56
(1) Equipment	$ 50,000		$50,000
(2) Oper.Costs	15,000		15,000
	$ 65,000		$65,000

13. Increased Production of Rice:

a. Proposed Description: The Regional Director, Food and Agriculture Organization, Cairo, has expressed a keen interest in increased production of rice. Rice produces more food per acre than any other crop now grown in Egypt, and at present the surplus can be exported. Early adoptation of the "Malek Rice Process" by Egyptian millers should place this country in position to export a dependable supply of high quality rice to nearby countries.

By means of irrigation pumping in the Delta, it would be possible to supply additional water to permit an increase in the rice acreage. In the Beheira Province, three or more irrigation pumps of 400 GPM capacity are to be installed. The use of water from these pumps would permit the establishment of a demonstration project on rice production in areas not now growing this crop.

b. Timing

1954	1956	1958
2000 F.	3880 F.	13,000 F.

(Rice would be an acceptable first crop to use on the reclamation projects as they are brought into production. Additional demonstrations could be arranged in other parts of the Beheira Province as agreed upon by the cooperators).

c. Benefits: The ultimate benefit of this proposal to increase the production of rice would be to increase the production of rice would be to increase the volume of an exportable commodity. By using superior seed stocks in planting rice on the reclamation projects, a substantial amount of high quality seed could be made available for distribution among rice growers within the Beheira Province.

d. Estimated Costs: This should not be an expensive project to activate. The costs of superior seed stocks for the initial plantings could be recovered from sales of high quality planting seed to farmers

B. Reduce Production Losses By Using Modern Protective Measures: Agricultural Extension faces a major responsibility for assisting the Government of Egypt in organizing and executing an effective campaign to reduce the loss of agricultural products now resulting from insects, diseases, and weeds.

1. Diseases of Plants and Animals: TCA should provide the services of one extension specialist in the field of plant pathology, and two in the field of animal diseases.
   a. Proposal Described:
      (1) Plant diseases: Assist in organizing and executing programs of seed treatment and field spraying and dusting.
      (2) Animal Diseases: Assist in organizing 450 graduate veterinarians in Egypt into an effective medium for controlling animal diseases and parasites.
   b. Timing: (The Agricultural Services Sub-Committee can see merit in the suggestion to work on a village basis, "cleaning up" an entire village area and then moving on to another. The best policy should be determined by the appropriate personnel of TCA in cooperation with representatives of interested Divisions or Sections in the Ministry of Agriculture.
   c. Benefits: The control of plantdiseases and/or animal diseases and parasites in an entire village area would serve as demonstrations to other villages of the effectiveness of group action. Likewise, the work in the demonstration provinces would indicate to other provinces in Egypt the savings that would be made from effective control of diseases now causing heavy losses to crops and livestock.
   d. Costs:

	1953-54	1954-55	1955-56
(1) Specilists (3)	$ 25,000	$25,000	$25,000
(2) Equip & Supplies	25,000	25,000	25,000
	$ 50,000	$50,000	$50,000

2, Insects Injurious to Plants and Animals: It is proposed that TCA provide one Extension Specialist for control of insects injurious to plants and animals.
   a. Proposal Described: Extension Specialist to work with officials, G.O.E. in organizing and executing a cooperative program of insect control in the Beheira and Fayoum Province.
   b. Timing: (See Disease Control Above)
   c. Benefits: (See Disease Control Above)
   d. Costs:

	1953-54	1954-55	1955-56
(1) Specialists (1)	$ 8,500	$ 8,500	$ 8,500
(2) Equip & Supplies	10,000	10,000	10,000
	$18,500	$18,500	$18,500

3. Controlling Weeds or Undesirable Vegetation:
   a. Proposal Described: Control of weeds or other undesirable vegetation on cultivated lands, roads, and banks of irrigation and drainage ditches and canals.
   b. Timing: The Agricultural Services Sub-Committee suggests joint determination of an effective approach to the weed control problem in the two demonstration provinces. The organization of Weed Control Districts is suggested as a workable procedure.
   c. Benefits: The elimination of weeds will result in increased yields of crops of better quality, and after eradication, less labor is required to produce the crop. At present, dense growth in irrigation and drainage channels seriously interferes with the flow of water in some areas.
   d. Costs:

	1953-54	1954-55	1955-56
(1) Specialist	$ 8,500	$ 8,500	$ 8, 500
(2) Equip & Supp.	11,500	11,500	11, 500
	$20,000	$20,000	$20, 000

C. Marketing Survey and Improved Marketing: There is urgent need for the allocation of at least one specialist in Agricultural Marketing to assist G.O.E. in organizing and conducting a marketing survey as a preliminary to selection and resettlement of farmers on reclamation project, and to obtain the adoption of improved marketing of agricultural commodities.
   1. Proposals described:
      a. Marketing Survey: A survey to determine potential markets for agricultural commodities that can be produced in the Beheira Province should be completed within the next four to six months to furnish data that may be coordinated with information from studies to determine the economic size of farm units on the new reclamation projects. These studies should take into account the food habits and requirements of consumers in the Beheira Province and potential market outlets for agricultural commodities surplus to local requirements.
      b. Improved Marketing: TCA marketing specialist could be of much help to GOE in encouraging improvement in the various procedures through which agricultural commodities pass from producers to consumers. These procedures include, among others, sorting or grading; packing; storage; refrigeration; processing; transportation; and actual selling.
   2. Timing: It is recommended that inquiry be made to determine if Farouk University at Alexandria or the Ministry of Agriculture have made marketing surveys of the Beheira Province. If there is no information regarding outlets for agricultural commodities raised in this Province, and improvements needed in marketing procedures, it is recommended that the

surveys be completed under contract not later than January 1, 1954 for the 1120 feddan tract and July 1, 1954 for the 2000 feddan tract and January 1, 1955 for the 3880 feddan and 13,000 feddan tracts.

3. Benefits: Both domestic and export markets are becoming more insistent on dependable supplies of uniformly high quality agricultural commodities. Information on Market demands and potential outlets is of value to the producer also. Good commodities can be made available only if rigorous requirements are applied to sorting or grading, packing, storing, processing and transportation. The nation will profit through reduced losses now occurring between producer and consumer, and consumers will realize more benefit from their expenditures for food.

4. Estimated Costs: .side from the expense of the marketing survey, will be dependent upon the magnitude of the marketing program which the G.O.E. considers advisable. The proposed Agricultural Marketing Technician and the specialist on Agricultural Cooperatives and Agricultural Credit can render valuable assistance to GOE technicians with the marketing phase of development program in the demonstration province.

	1953-54	1954-55	1955-56
Marketing Survey	$ 5,000	$ 5,000	$ 5,000
Imp. Marketing	10,000	50,000	75,000
	$15,000	$55,000	$80,000

D. Providing Agricultural Credit Needs: See special report by Paul Fankhouser, Agricultural Credit Consultant, Task Force.

E. Summary of Costs ø

	First Yr.	Second Yr.	3rd. Yr.
1. Improved Seed	$ 604,800	$ 604,800	$ 604,800
2. Hybrid Corn	20,000	16,600	16,600
3. Chemical Fertilizers	63,000	63,000	63,000
4. Irrigation Practices	20,000	20,000	20,000
5. Drainage	1,960,000	1,960,000	1,960,000
6. Farm Vegetables	1,500	1,500	1,500
7. Poultry and Eggs	160,000	160,000	160,000
8. Livestock Improvement	5,400	2,700	2,700
9. Rabbits and Bees	1,000	1,000	1,000
10. Fisheries	10,000	10,000	10,000
11. Tree Plantings	?	?	?
12. Farm Mechanization	65,000	--	65,000
13. Disease Control	50,000	50,000	50,000
14. Insect Control	18,500	18,500	18,000
15. Weed Control	20,000	20,000	20,000
16. Market Survey	5,000	5,000	5,000
17. Improved Marketing	10,000	50,000	75,000
18. Agricultural Credit	(See Fankhouser's Report)		
	$3,014,200	$2,983,100	$3,072,600
	LE.1,076,500	LE.1,065,400	1,097,350 LE.

ø These figures apply Province wide, includin. the reclamation units.

VI. Special Recommendations and Suggestions: After spending almost two months in studying the agricultural problems of the Beheira and Fayoum Provinces and of Egypt as a whole, and the organizatio available for rendering technical and other assistance to the Egyptian Fellaheen, the Agricultural Services Sub-Committee of th TCA Planning Committee desires to offer the following special recommendations and suggestions:-

A. Agricultural Technicians Required: At the earliest possible date, the combined personnel needs of the regular TCA Agricultural Program and the Cooperative Program of Rural Development and Rural Rehabilitation should be reviewed to determine the additional American agricultural technicians that will be required to assist the Government of Egypt, and then initiate appropriate personnel action for recruitment.

After conferences with TCA Chief Agriculturist, Egypt, regarding personnel needs, the sub-committee decided to list the agricultural technicians who comprise the present TCA Agricultural Staff and then suggest personnel needed to implement the enlarged program.

1. Present Agricultural Staff (American Technicians)
   a. Chief Agriculturist - Dr. Lindsey Brown, Acting
   b. Agrl. Extension Advisor - Wendell Holman
   c. Drainage Consultant - Earl. C. Johnson
   d. An. Husb. Research Specialist - B. Knapp, Jr.
   e. An. Hygiene Research Advisor - Dr. W. Malcolm Reid
   f. Engineering Advisor - Machinery - A. J. Schwantes.
   g. Poultry Improvement Advisor - L. E. Weaver.
   h. Livestock Improvement Specialist - H. H. Hanson
   i. Dairy Herd Improvement Specialist - W. E. Wintermeyer.
   j. Fisheries Consultant - Elmer Quistorff.
   k. Hybrid Corn Specialist - Floyd S. Ingersoll.
2. American Agricultural Technicians needed, Some of whom Have Been Recruited:
   a. Soil Management Specialist - Lindsey Brown. (Mr. Brown currently is serving on the TCA Task Force but later in 1953, will return to Egypt for assignment to Agrl. Staff).
   b. Head, Animal Husbandman - Dr. J. E. Nordby
   c. Agronomist: (Technician with research and extension experience in field crops under irrigation is needed - emphasize corn, wheat, rice, grain sorghums, cotton, sugar cane, onions, potatoes and berseem).
   d. Plant Pathologist: (Request has been made for specialist to assist with control of Citrus Scale. This is only one of many plant diseases causing serious losses; e.g. wheat smu wheat rust; Mildew on Cucurbits).
   e. Entomologist: (There is urgent need for Extension Entomologist to assist GOE in organizing and executing more effective control programs to reduce food losses due to insects,

f. Extension Veterinarian:
(Request has been made for Extension Veterinarian, to assist in organizing and advising the 450 graduate veterinarians of Egypt).

g. Serum Production Specialist:
(needed to assist GOE in activating the Egyptian Serum Production Laboratory).

h. Agricultural Credit and Cooperatives:
(With the urgent need for agricultural credit available to the fellaheen and adapted to their needs, and with over 2000 agricultural cooperatives organized, there is adequate justification for a specialist or consultant qualified to assist GOE in these two areas of interest).

i. Agricultural Marketing:
(There is urgent need for an agricultural marketing survey to determine the potential markets, both domestic and foreign, for agricultural commodities which Egypt can produce, and the improvements in agricultural marketing procedures most needed. An agricultural marketing technician or consultant could be most helpful).

j. Extension Specialists: Since Agricultural Extension must assume heavy responsibilities in implementing the agricultural improvement programs in Egypt, early attention must be given to the recruitment of additional personnel.

(1) Extension Training Team: Assuming that the Government of Egypt approves the establishment of a National Agricultural Extension Service and has available technically trained and experienced personnel for key positions, there is need for a "training team" of experienced leaders and specialists in agricultural extension from the United States to conduct "on-the-job" training in extension philosophy and extension methods. Such training for carefully selected, agriculturally trained, Egyptian personnel will increase their effectiveness in enlisting the cooperation of the fellaheen in putting improved agricultural practices into use.

The size of staff on the "training team" should be governed by the size of the Extension Staff established by GOE. A training team of two members would be adequate at the outset, with additions as the G.O.E. extension staff increases.

(2) Agricultural Extension Specialists: The TCA Agricultural Staff has recommended that two home management specialists and two agricultural extension agents be recruited from the US to assist GOE. with the extension work contemplated for the selected provinces.

k. Wheat Rust Technician:
(Egypt in cooperation with the FAO has urged the establishment of a Regional Wheat Rust Laboratory. It would appear appropriate to appoint a wheat breeder to cooperate with the regional laboratory staff in the development of rust resistant wheats of superior quality for bread making).

l. Research Specialist - Soil Salinity:
(If a Regional Soil Salinity Research Laboratory is established in Egypt, it will be advantageous for TCA to provide a minimum of one research specialist in soil Salinity as indication of its desire to cooperate and as recognition of the importance of the project).

m. Assistant Chief Agriculturist:
(This man should have basic training in Agricultural Economics and be experienced in administration of agricultural planning and programming, and knowledge of international markets for agricultural commodities. The scope of the agricultural activities would appear to justify this assistance to the Chief Agriculturist).

n. Administrative Assistant:
(Recruitment has been requested but the individual has not been appointed. With the size of the program, it is important to have one person immediately responsible for budgets and accounting, requisitions, inventories, etc.)

3. Note: A proposed staff consisting of three administrative people and twenty-five (25) agricultural technicians may appear somewhat ambitious. Since agriculture occupies an important position in the regular TCA technical aid program in Egypt as well as in the cooperative program of community development and rural rehabilitation, the agricultural activities must be adequately staffed.

B. One Agricultural Staff For The Coordinated Programs: It is recommended that the present TCA agricultural staff in Egypt, supplemented by recruitment, encourage the Government of Egypt to coordinate the regular TCA agricultural program with the cooperative program for community development and rural rehabilitation and that the coordinated program be executed by appropriate Ministries and branches of the Government of Egypt.

With a staff of experienced agricultural technicians already at work in Egypt on the regular TCA program, it should be comparatively simple procedure to recruit additional American agricultural technicians to assist the Government of Egypt in implementing the two programs concurrently with a minimum of duplication of effort.

C. National Agricultural Advisory Committees: It is recommended that a National Agricultural Advisory Committee be formed by the National Production Council to assist the Council and cooperating Ministries of the Government of Egypt with the evaluation of agricultural problems and methods of rendering more adequate service to the Egyptian fellaheen.

Such a committee should be composed of Egyptians, from important phases of Egyptian agriculture, including the fellaheen. It should have advisory responsibilities only.

D. Economic Size of Farms: It is strongly recommended that research be undertaken at an early date to determine the most economic size of farm or land unit required to enable the fellah to pay for the land and improvements during a reasonable amortization period, and have enough left to feed, clothe, and educate his family.

This factual information based on careful studies of established farming operations and of operations on newly settled reclamation projects would be extremely helpful. The Agricultural Services Sub-Committee is much concerned over the ability of the fellah to repay the cost of the land and necessary buildings, equipment, livestock etc. needed to put him in business, from the returns possible from five feddans of land.

E. Additional Irrigation Water Needed: The Agricultural Services Sub-Committee desires to emphasize again that each project for land reclamation and development should assure prospective settlers that there will be an adequate supply of water for irrigation.

Certain types of water development for irrigation are difficult to finance and at best will not be quickly completed.

F. Pilot Plant For Malek Rice Process: Approximately 85 percent of the nutritive value of rice, including essential vitamins, is contained in the bran and germ. Normal milling processes removes the bran and germ, hence most of the nutrients are lost to the consumers of the milled rice. Malekizing is a patented process for treating rough rice as received from the grower, and includes soaking in hot water, steaming and drying prior to milling. Malekizing transfers a large part of the valuable nutrients from the bran and germ into the kernel or endosperm where they are sealed by steam pressure and thus retained for the consumer.

No method yet proposed for improving the nutritive qualities of a major food offers as much promise as Malekizing rice. Since rice is an important crop in Egypt (565,000 Metric Tons annually in 1951 and 1952) and is valuable for local consumption as well as for exports (200,000 to 400,000 tons clean rice annually), it would appear that the possibilities of obtaining private capital for constructing a pilot plant for malekizing rice should be thoroughly explored. Advantages as applied to Egypt appear to be (1) increased nutritive quality of locally consumed rice including military requirements; (2) improved quality of rice made available for the export market; (3) reduction of insect losses due to steam sterilization during processing; and (4) reduction of loss due to cracked rice.

G. Regional Salinity Laboratory: It is recommended that the Government of Egypt be encouraged to establish a Regional Laboratory to conduct research on salinity of soils and irrigation and drainage waters and that other countries in the Near East and Middle East be invited to cooperate by assigning personnel, funds, equipment, etc., to assist in developing a well-rounded program of research on salinity problems having regional significance.

It is further suggested that liaison be established with the US Regional Salinity Laboratory at Riverside California which would result in an exchange of research personnel and technical information.

H. Demonstrate Possibilities of Milk Production Under "Dry Lot" Management: Unfortunately, the demand for cotton and cereal grains in Egypt interferes somewhat with the use of land to produce feeds required for the production of meat and milk. On the other hand, year-round cropping under perennial irrigation makes livestock production almost imperative because of the urgent need for animal manures.

Fortunately, several crops are grown in Egypt which are valuable as livestock feeds, and by adjustments in the area devoted to cotton, additional quantities of feed crops could be made available for milk production.

It is recommended that the EARIS Project arrange for a pilot plant to demonstrate the possibilities of milk production under "dry lot" management. Under "dry lot" management, where milk production would be the primary objectives, efficiency of production should appeal to the private operator who has the managerial ability and financial backing to operate this type of enterprise. Cairo and Alexandria should furnish an excellent market for a sanitary product of dependable quality. With dry lot management, the animal manures, so essential to the maintenance of soil productivity under intensive cropping practices in the Nile valley would be conserved with little loss and its sale to farmers would produce supplemental income.

I. Reducing The Number of Work or Draft Animals: Rough estimates indicate approximately 1,000,000 draft animals in Egypt which are surplus to actual requirements. With approximately 9500 tractors in use in Egypt in 1952 of which over 5700 were imported during 1950, 1951 and 1952, progress is being made in mechanizing farming operations. Therefore, it appears appropriate to recommend that a detailed study be made to determine the draft animal requirements of Egypt and the number of acres of land which could be released for producing human foods when surplus draft animals are eliminated.

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