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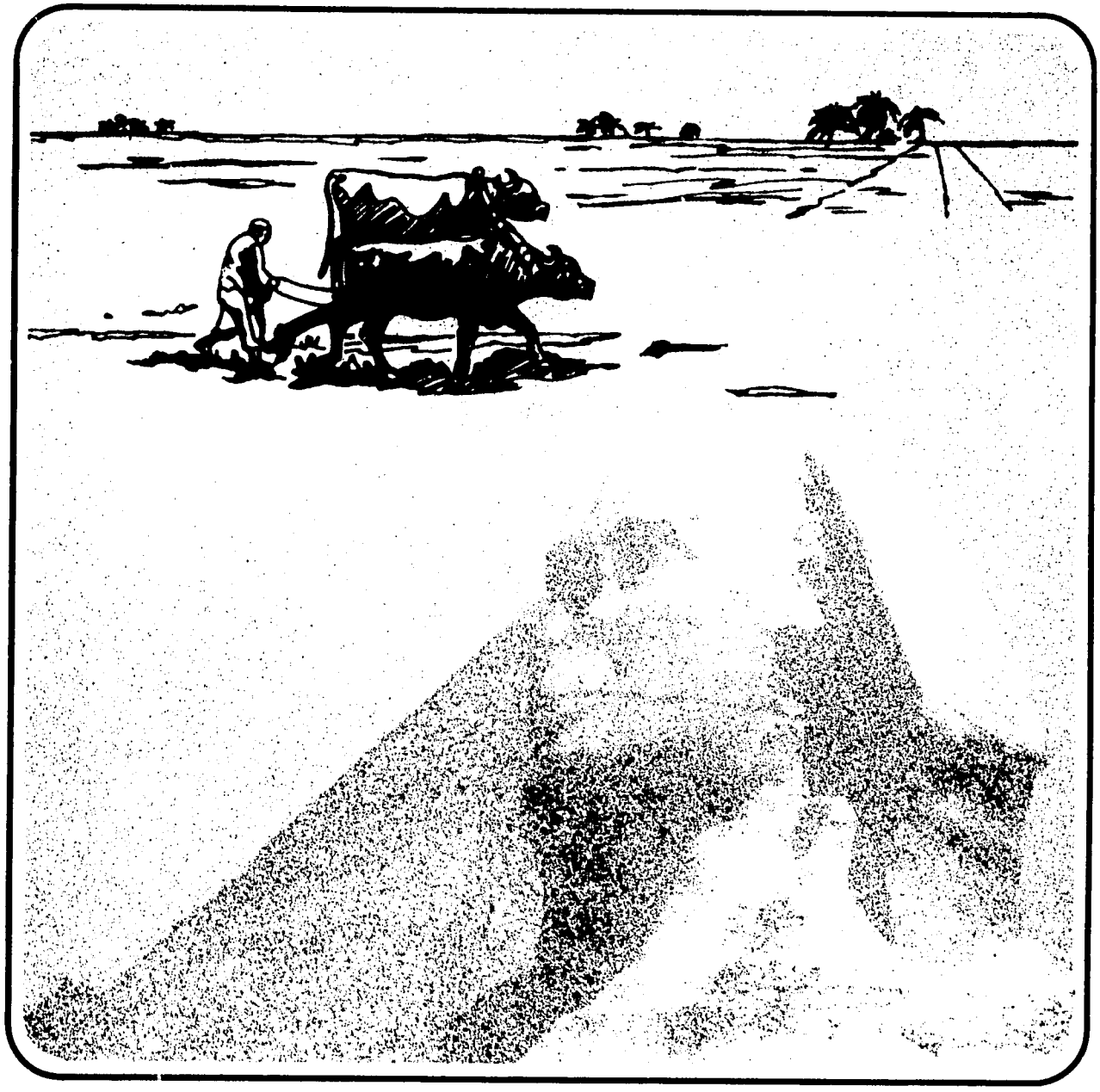
Egyptian Agriculture and the U.S. Assistance Program



United States
Department
of Agriculture

Office of
International
Cooperation and
Development

Technical
Assistance
Report No. 2

ABSTRACT

This report presents an overview of major Egyptian economic problems and special agricultural problems being addressed by the U.S. economic assistance program for the country. The various elements of the program are described and evaluated, with special reference to low-cost technology; potentials for private sector participation in economic development, including agribusiness; projects to increase agricultural output; cooperatives and credit.

Key words: Egypt, Agency for International Development (AID), crops, livestock, poultry, agribusiness, mechanization, cooperatives, credit

PREFACE

This report presents a general overview of the major economic problems in Egypt and examines specific aspects of its agriculture receiving attention in the AID program. These topics cover the present status of, and potentials for, implementing low-cost technology and measures needed to encourage private-sector participation in agricultural development, including agribusiness, cooperatives, and credit. Brief descriptions are given of the various technical assistance projects related to these areas, as well as other programs designed to alleviate problems within the national economy. As the text was completed in mid-1978, it does not reflect subsequent changes that may have been made in the AID program, nor the events leading up to, and following the signing of the peace treaty with Israel in early 1979.

This report includes portions of an administrative report prepared for the Agency for International Development (AID) in response to a provision in the International Security Assistance Act of 1977.

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The team visited Egypt November 4-19, 1977, and conferred extensively with Egyptian officials and with staff members of the American Embassy and AID in Cairo and Washington. The team is grateful for the excellent cooperation and assistance received and wishes to extend special thanks to the numerous Egyptians who generously gave their time and support. Messrs. Scofield and Motheral had primary responsibility for preparing both reports and wish to acknowledge the substantial contribution made by members of the University of California team.

CURRENCY EQUIVALENTS

Parallel market rate:
Egyptian pound (£E) 1.00 = US$1.43

Official Rate:
£E 1.00 = US$2.56

WEIGHTS AND MEASURES

1 acre	= 0.96 feddan
1 feddan	= 1.04 acres
1 hectare	= 2.47 acres = 2.38 feddan
1 kilogram (kg)	= 2.204 pounds
1 metric ton (MT)	= 2.204 pounds

ABBREVIATIONS

AID – Agency for International Development
ADCB – Agricultural Development and Credit Bank
CIP – Commodity Import Program, AID
CLUSA – Cooperative League of the United States
FAO – Food and Agriculture Organization, United Nations
GNP – Gross National Product
GOE – Government of Egypt
IBRD – International Bank for Reconstruction & Development (World Bank)
IDA – International Development Association
IFDC – International Fertilizer Development Center
ORDEV – Organization for the Rehabilitation and Development of Egyptian Villages
P.L. 480 – Public Law 480 - (Food for Peace), USDA
UCD – University of California at Davis
UNDP – United Nations Development Program
USDA – United States Department of Agriculture

DEFINITIONS

"Old lands" as used in this report refers essentially to the alluvial areas contiguous to the Nile River and its delta, for the most part under intensive cultivation.

"New lands" means all other areas in Egypt but more particularly the undeveloped desert lying in the proximity of the old lands.

"Nili crops" are those planted in July and August and harvested in October and November. The term "Nili" refers to the annual flooding of the Nile before completion of the High Dam, after which short-season crops were grown. Some traditional Nili crops, such as maize, are now planted earlier than previously, and yields are higher.

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June 1979

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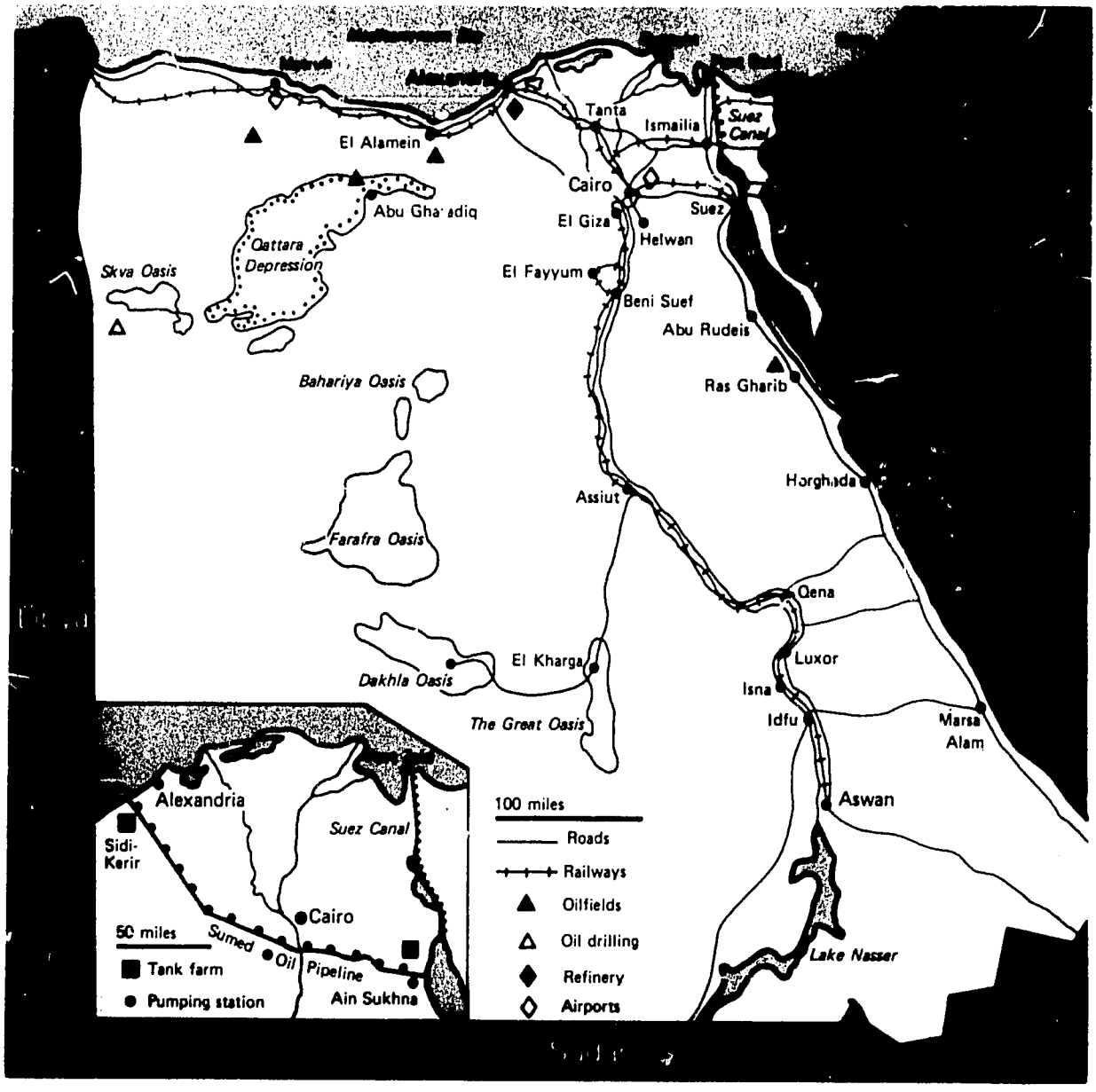
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Abu Rudeis
Bahariya Oasis
Ras Gharib
Hurghada
Assiut
Farafra Oasis
Qena
El Kharga
Luxor
Dakhla Oasis
Isna
Idfu
The Great Oasis
Marsa Alam
Aswan
Lake Nasser
100 miles
Roads
Railways
Oilfields
Oil drilling
Refinery
Airports
Alexandria
Sidi-Kerir
Suez Canal
Cairo
50 miles
Sumed Oil Pipeline
Ain Sukhna
Tank farm
Pumping station

EGYPTIAN AGRICULTURE AND THE U.S. ASSISTANCE PROGRAM

SUMMARY

The United States security assistance program has provided Egypt with about $1 billion annually in concessionary loans, grants, and technical assistance since 1976. The major portion of these funds has been directed toward correcting the serious balance-of-payments problem that followed the 1973 war, and toward rehabilitation and expansion of Egypt's agriculture, industry, and infrastructure.

Egyptian agriculture is the largest single sector of the economy but faces many problems. Some of these difficulties are centered in the small and fixed area of arable land, small farms operated chiefly with human and animal power, waterlogging, and salinity problems in the most productive old lands. Other problems, less amenable to outside technical assistance, are Government policies that tend to discourage maximum farm output and central control over cooperatives, credit, and the marketing system. A Five-Year Plan for the national economy released in August 1977 proposed several new policies to correct such problems, while other new policies have encouraged more domestic and foreign investment and relaxed central controls. As of early 1978, only modest progress had been made in implementing these policies.

The U.S. economic assistance program for Egyptian agriculture addresses some of these problems. Substantial quantities of food have been provided under the U.S. commodity import and the Food for Peace (P.L. 480) programs. Capital grants and loans have been made for new storage facilities at major ports for grains, fats, and oils, the purchase of irrigation pumps and dredging equipment to rectify existing deficiencies; and the manufacturing of equipment and raw materials for plastic drainage pipe. A speedup in the rate of installing drainage, financed by the World Bank, is viewed as essential to check the decline in crop yields in some areas and restore the productivity of the best lands.

Technical assistance projects underway or proposed for fiscal 1979 focus on rice, maize and wheat, poultry, and aquaculture. Other projects pertain to improvement of on-farm water management techniques, assistance for cooperatives, and means to give small farmers better access to farm inputs and low-cost technology. Increased funding is proposed to support economic and social activities undertaken at the village level and to provide more credit to the private sector.

INTRODUCTION

Following the reestablishment of diplomatic relations with Egypt in 1974, the United States, primarily through the Agency for International Development (AID), initiated a substantial economic assistance program. The assistance to Egypt is part of the overall security assistance program for the Middle East designed to achieve political and security goals for the United States.

Such goals differ significantly from those associated with development assistance programs in most other parts of the world, where the major emphasis is on providing resources and technology to stimulate economic growth and improve conditions of the poor. Although these considerations apply also to Egypt, political considerations are especially important because Egypt's relations with other Arab countries strongly influence the stability of the entire region and access to vital oil supplies. Egypt holds a strategic position in the region; revitalization of the country's economy and support for the moderate Government there are viewed as essential to achieving a lasting peace in the entire region.

Three other countries in the Middle East–Israel, Jordan, and Syria–also receive substantial funds under the security assistance program. Of the total funds requested for fiscal 1979, Israel would receive $785 million; Egypt, $750 million; and Jordan and Syria, each about $90 million. In addition, about $207 million worth of agricultural commodities are proposed for Egypt under P.L. 480. Thus, the total assistance program for fiscal 1979 is about the same as was authorized for fiscal 1978, but slightly more than in fiscal 1977.

Egypt received more than $12 billion in foreign aid during 1974-77. Around $7.2 billion came from Persian Gulf States, mostly in grants, loans, and bank

deposits to finance foreign exchange. Of the balance, U.S. commitments have been $2.3 billion in grants and concessionary loans, and commitments from international credit agencies have totaled about $1 billion. Other donors include the European Community (EC) as well as bilateral aid from West Germany, France, Japan, Canada, and several other countries.

PROBLEMS OF THE EGYPTIAN ECONOMY

A limited resource base especially of productive land, rapid population growth, slow industrial growth, and the dominance of the public sector in most economic activities have obstructed Egypt's efforts to create a better life for its people. These basic weaknesses have been manifested in: (1) A mounting drain on foreign exchange to pay for an increasing level of food imports; (2) real as well as disguised underemployment and unemployment; (3) internal political risks that block efforts to relax a costly system of price controls and subsidies; (4) a massive and lethargic bureaucracy that discourages both domestic and foreign private investment; and (5) shortages of spare parts, raw materials, and services needed to support and stimulate Egyptian industries.

These problems have contributed to the depletion of Egypt's foreign exchange reserves, the buildup of massive short term debts, and neglect of transportation, communication, housing, and public services. The agricultural growth rate—long viewed as the primary source of foreign exchange to finance industrial growth—has fallen behind the rate of population growth. Rural-to-urban migration has accelerated because the farm sector with a fixed land area seems unable to absorb the large numbers entering the labor force. At the same time, the industrial sector is not expanding fast enough to provide employment. The Egyptian Government has had to focus on the urban poor, who are more likely to challenge Government policies than those in rural areas.

Realization of the peace treaty with Israel should enable Egypt to redirect its limited capital resources to domestic needs and would contribute to general economic and political stability of the region.

The Government of Egypt (GOE) has been well aware of these basic problems for the past several years and has proposed or adopted a number of policies aimed at their resolution. The first of these was the so-called "open door" policy announced in 1973, which contained the following basic principles:

- Decentralization of decisionmaking by public sector enterprises;
- Encouragement of investment and entrepreneurship by the private sector;
- Removal of then-existing constraints on foreign investment, as well as the creation of positive incentives; and
- Expanded cooperation with the Arab countries and the West.

Some progress has been made in implementing this new policy. Former public-sector general organizations, such as those engaged in farming, have been reorganized as companies to be operated for profit. However, problems remain in freeing these companies from controlled prices for their output. In addition, profit potentials of manufacturing firms are hampered by excess workers carried over from overstaffed public sector activities. Businessmen in the private sector are reluctant to retain such excess labor, but would be required to do so by Government labor policies.

Several revisions have been made in the original foreign investment laws to attract more foreign capital, but other considerations still serve as major deterrents. These include the uneasy peace in the region, the lack of financially qualified domestic partners for joint ventures, and undefined price policies of the Government.

The initial draft of a new Five-Year Plan (1978-82) released in August 1977 recognizes these and other problems and proposes several new policies to resolve them. Key features of the plan are: (1) Shift the structure of imports from consumer to capital goods; (2) restructure price and income policies to eliminate distortions and increase free flow of foreign exchange; (3) improve decisionmaking policies; (4) correct balance-of-payments problems by imposing stricter budgetary controls and utilizing the parallel market exchange rate for additional import and export items.

Prospects for achieving these goals rest heavily on expected increases in revenues from the Suez Canal after widening is completed in 1980, increased earnings from tourism, and new discoveries of oil and gas. Remittances from Egyptians working abroad, especially those in Arab countries, are expected to more than double from the present $700 million annually. Although no dramatic turnabout can be expected from some of these policies in the short run, several sectors have shown significant gains since 1974. The industry and mining sectors have each grown by 10 percent, and petroleum, by 30 percent (owing to recovery of the Red Sea oil fields from Israel). The construction industry has benefited from massive reconstruction activities in the Suez area.

However only minor gains have been made in agricultural production, exports, and progress toward achieving food security. Total cereal production in 1977 was about the same as the 1972-74 average, while output of cotton and oilseed crops (chiefly cottonseed) was down 20 percent. However, production of vegetables and fruits as well as poultry showed

substantial growth. Total meat output in 1977 was substantially higher than in 1972-74, primarily owing to much larger imports of corn and soybean meal under P.L. 480 and the U.S. commodity import program. Imports of meat and dairy products have increased sharply.

While receiving emphasis by the GOE in official policy statements, agriculture's share of Government expenditures has remained consistently below its percentage contributions to the gross national product and foreign exchange earnings. Accounting for 44 percent of total employment, 28 percent of gross domestic product, and more than half of exports, agriculture has received less than 10 percent of the annual Government budget for at least the past decade. The limited funds allocated have been used chiefly for land reclamation and development and public sector production activities, especially poultry, rather than investment in the more productive old lands. This lack of Government support for research, extension, credit, cooperatives, and other services may help explain why agriculture has failed to make the expected contribution to the national economy.

OVERVIEW OF EGYPTIAN AGRICULTURE

Throughout Egypt's 5,000-year history, agriculture in this essentially desert country has been confined to the narrow valley along the Nile River from Cairo some 500 miles south to Aswan, and to the fan-shaped Nile Delta north of Cairo to the Mediterranean Sea. Annual flooding of the Nile and diversion of water from the river sustained an intensive agriculture capable of feeding less than 11 million people up to the beginning of the 20th century. Then, as now, cotton and rice were grown for export, and the rest of the land provided basic foodstuffs for the predominately rural population.

Fueled by an annual growth rate of 2.0-2.5 percent, Egypt's population had increased to an estimated 39-40 million in 1978 and could reach 60-70 million by 2000. Even though the 6 million acres of arable land (less than 3 percent of the total land area) produces nearly 12 million acres of crops annually—and yields have increased—the hope of self-sufficiency in basic foodstuffs has faded with each succeeding decade. This inability to become agriculturally self-sufficient and consequent growth in food imports puts more pressure on high-value export crops—chiefly cotton, fruits, vegetables, and other crops in which the country has a comparative advantage. But even if this strategy were successful in producing the foreign exchange needed for food imports, it would not provide the surplus needed to finance industrial expansion.

Despite this apparent impasse, a number of development measures can mitigate the rising need for food imports and slow substantially the attendant drain on foreign exchange. Opportunities exist for further increases in crop yields from the old lands, relaxation of Government constraints to create incentives for increasing production, and better coordination of research and extension programs. Although reclaimed desert lands do not yet make a significant contribution to total output, they may offer long-range potential for producing export crops, as well as a base for expanding livestock production.

Technical assistance, however, cannot make its maximum contribution to specific objectives unless the institutional environment is favorable. A substantial package of available technology from the more advanced countries can be adapted and applied in most developing countries, but Government policies often discourage or prevent farmers from benefitting from new technology. Egyptian policies governing production, allocations of inputs, pricing, subsidies and the whole market structure hinder a free flow of resources to their highest uses and deter economic incentive. Thus, cotton and cereal production is hampered by disincentive pricing, while ineffectual controls lead to sharp price gains in beef, vegetables, and fruits.

Most of these policies were developed to implement social and economic goals for the urban population without a full understanding of their implications for the agricultural sector. These problems are now recognized, but the needed changes will come slowly.

Five-Year Plan for Agriculture

Agriculture received prominent attention in the overall plan for the Egyptian economy for 1978-82. The chapters devoted to agriculture show keen awareness of the numerous problems needing attention and are generally consistent with recommendations made in independent studies and with general directions of the U.S. economic assistance program.

The Plan gives highest priorities to increasing food production from old lands and further investment in new lands. Emphasis also is placed on mechanizing field operations to release livestock for meat and milk production.

The Plan discusses alternative cropping patterns that would increase production of higher value crops for export, while also increasing cereal production. This is recognized as a difficult balance to achieve unless the present pricing system can be modified and the private sector is given more freedom to participate in export markets.

Other topics covered in the Plan include the need to extend electrification to rural villages; improvements in the marketing system, especially storage

facilities; and more effective extension and credit facilities.

Although the Plan represents the first recent effort by the Government to identify critical problems limiting agricultural production, it does not clearly set priorities for solving these problems. The probable capital investments needed to implement many of the proposals, especially those to further develop partially reclaimed lands and to undertake additional land reclamation, greatly exceed national budgets for agriculture in recent years. Even so, the Plan does provide some general guidelines for the allocation of economic assistance by AID and other donors.

Private Versus Public Sectors

Following nationalization of the Egyptian economy in 1962, the farm sector was the only major economic activity left in private ownership. (Ten years earlier, land reform had reallocated large land holdings to individual farmers, and additional steps were taken in later years to limit further the size of land holdings.) However, the manufacture and distribution of farm inputs–as well as food processing, distribution, and exports–were converted to public-sector activities, thus making farmers and food production an integral part of the total managed economy. Decisions regarding what to plant, what inputs to use, and prices for output were all determined by the Ministry of Agriculture and other central planning agencies.

Despite the current Government policy of freeing the farm sector from excessive central control over production decisions, prices and credit, actual progress is likely to be slow because of bureaucratic rigidities and the probable impact of higher, free-market prices on food costs to the urban population.

The recent creation of village credit banks should help relax cooperatives' control over credit and thus free farmers from the previous mandatory requirement that they be members of a cooperative.

Official sanction also has been given to supporting more economic and social activities by the Organization for Rehabilitation and Development of Egyptian Villages (ORDEV). These local organizations are already sponsoring a number of small business enterprises, which could be expanded if additional funding is provided. AID also has an approved fiscal 1979 project to support ORDEV activities directly, as well as funding of a project to extend electrification to more villages and thereby facilitate local manufacturing activities.

Perhaps the most specific example of how Egypt's "open door" policy may benefit agriculture is the Government's strong effort to encourage foreign investment in agribusiness projects. The Government is seeking a fresh stream of private capital, new production technology, and marketing expertise that could indirectly benefit the small farmer. Possible joint ventures with public-sector farming companies would loosen the numerous constraints under which such companies have operated and introduce profit-oriented incentives needed to increase food production and more efficient food processing and distribution.

CROPPING PATTERNS AND PROBLEMS

Egypt is fortunate to have a year-long growing season and irrigation water available throughout the year, permitting two crops on the average. Current land use patterns are tightly knit into a system resulting from tradition, agronomic and climatic constraints, and Government controls. Rotations combine short and long-season crops in such a way as to keep the land under almost continuous cultivation.

Cotton requires the longest growing season and occupies the land from March through October. Wheat is a winter crop (November-April) and is followed by rice or maize.

Vegetables are grown throughout the year. Cool weather crops such as potatoes, cabbage, and some tomatoes are grown in the winter season; cucumbers, egg plant, and tomatoes during the summer; and a third crop of various vegetables in the Nili season from August through October.

About 10 percent of the land is devoted to sugarcane and fruit and hence is excluded from annual crop rotations.

Excessive use of irrigation water since completion of the High Dam in the mid-1960's has accentuated the problems of waterlogging and buildup in salinity of the old lands. These conditions are generally viewed as the major problems requiring immediate and substantial effort if crop yields are to resume their previous rates of increase. In some areas, the problem has become so acute that land has been forced out of production. A substantial drainage program, financed by the World Bank and underway for the past several years, will eventually provide drainage for about 4.2 million feddans.

AID and West Germany are providing funds for the construction of plants and raw materials to manufacture plastic drainage pipe, which should speed up the drainage program. In addition, AID has initiated a water use and management project to develop and demonstrate improved irrigation water management and associated on-farm cultural practices designed to increase crop yields and alleviate problems associated with current irrigation practices. Although limited to several pilot project areas initially, the results will eventually benefit substantial areas of old lands.

Alternative Cropping Patterns

Both the GOE and international agencies have focused on devising new or alternative cropping patterns that would boost net output from the fixed land area and also meet critical national goals. These major goals are to: (1) Increase foreign exchange earnings; (2) produce more labor-intensive crops to increase returns to labor and land; (3) provide a more adequate supply of feed and forage for livestock; and (4) reduce food imports.

Because of the obvious conflicts among these goals there is no ideal solution, but compromises can be effected that would result in small net gains over the current land-use pattern for old lands. In the long run, higher value horticultural crops—notably fruits and vegetables—offer greater opportunity for increased productivity and export earnings than do traditional grain and fiber crops.

For the next decade, however, the traditional cereal crops still offer large growth potentials from as yet unexploited technology. Their production should continue to receive high priority, particularly since gains in rice, wheat, and maize will also be export-earning or import-saving. The development and adoption of quicker maturing cereal varieties, especially rice, could make more land available for summer crops.

Determining the changes needed in the cropping pattern—as indicated by domestic food needs, import and export considerations, and support for the livestock sector—would require a detailed production adjustment model not feasible here. Consequently, only the direction of change is indicated. Although previous models have indicated that a small increase in total agricultural output may be possible, the assumptions incorporated in these models were not wholly consistent with Government objectives. Increased yields are likely to contribute substantially more to total net output than possible shifts in areas devoted to the various crops. Tables 1 and 2 show recent trends in production, imports, and exports of major agricultural products.

Cotton.—Although this crop is likely to remain dominant in any alternative cropping plan, serious consideration is being given to shifting a higher proportion of exports to hard-currency markets and using the proceeds to import short-staple cotton for the domestic textile industry. Approximately 100,000 bales of cotton were imported from the United States in October 1978 under special financial arrangements. If this approach proves feasible, the area devoted to cotton could be maintained at the present level, or possibly lower, without reducing foreign exchange earnings.

Rice.—Egypt has long been self-sufficient in rice and exported substantial quantities through the early 1970's. However, the exportable surplus has declined sharply since then as price subsidies encouraged increased per-capita consumption. Projected demand indicates that imports will be required in the near future. Because almost all area suitable for rice production is now being utilized, emphasis is being placed on increased yields and shorter season varieties to release land earlier in the fall for planting to other crops.

Oilseeds.—Production of vegetable oil, now derived almost entirely from cottonseed, falls far short of requirements. Production from the limited area of peanuts and sesame is consumed directly and not processed for oil. Other oil crops, such as soybeans and sunflower, have been suggested for new lands, but the prospects appear limited for production on a significant scale on the old lands. Imports of edible oils, as well as oilseed meals for poultry and livestock, are likely to be needed in increasing quantities.

Maize.—Although an important food crop for the rural population, maize has been largely neglected by Government planners. Some progress has been made in the introduction of higher yielding varieties, but a substantial potential still exists for increasing total output by earlier planting, higher plant population, and greater fertilizer use. Larger quantities have been imported in recent years to support the poultry and livestock industries.

Sugar crops.—Sugarcane is the primary source of sugar, but only limited expansion is possible because of the high water requirements and the drainage problems associated with the crop. Sugarbeets have been proposed for new lands and experimental work is underway. This crop requires less water than sugarcane and occupies the land for only a portion of the year, thus permitting a second crop. However, projected requirements substantially exceed production potentials, and sugar imports will likely increase. Nevertheless, the currently adequate world supplies at low prices indicate that substantial investments to expand domestic sugar crops may not be warranted.

Minor crops.—These include horse beans, lentils, chickpeas, and other legumes that provide vegetable protein. Present production is not sufficient to meet domestic demands, and substantial quantities are imported. Self-sufficiency could be achieved with relatively small increases in the areas devoted to these crops, as well as from increased yields.

Forage crops.—Now limited chiefly to berseem clover and residual roughages from maize, sorghum, and cereal crops, low feed production is the major constraint on the livestock industry. Although supplies are adequate in the winter and spring, they fall short of needs in the summer when livestock must survive on crop wastes and cottonseed cake. Diversion of land to forage crops in the summer would reduce production of food crops as well as cotton. While

Table 1.–Egyptian Production of Major Crops, 1972-74 Average and 1975-77

[In 1,000 metric tons]

Crop	Average 1972-74	1975	1976	1977[1]
Cotton (lint)	483	382	396	389
Major cereals:				
Wheat	1,810	2,034	1,960	1,697
Rice (paddy)	2,274	2,423	2,300	2,272
Maize	2,457	2,782	3,047	2,724
Sorghum	836	775	759	648
Barley	98	118	123	111
Total	7,475	8,132	8,189	7,452
Oilseeds:				
Cottonseed	854	652	677	665
Flaxseed	18	24	25	25
Sesame	20	17	16	18
Peanuts	28	28	28	30
Total	920	721	746	738
Horse beans	289	234	254	270
Lentils	56	39	40	41
Major vegetables:				
Tomatoes	1,658	2,107	2,066	1,959
Potatoes	700	720	893	960
Onions	536	585	652	723
Cabbages	287	321	329	340
Total	3,181	3,733	3,940	3,982
Major fruits:				
Oranges	757	856	755	671
Grapes	171	225	279	248
Bananas	110	112	115	120
Dates	396	405	417	415
Total	1,434	1,598	1,566	1,454

[1] Preliminary.

Source: Ministry of Agriculture and USDA, Economics, Statistics and Cooperatives Service estimates.

increases in maize and sorghum for forage and new plantings of Napier grass may be practical for specialized livestock feeding operations, the adoption of perennial forage crops such as Napier grass is less feasible for the average farmer. Even if tractors become widely used for land preparation, releasing animals from field work, feed supplies would remain inadequate unless total livestock numbers were reduced substantially.

Fruits and vegetables.–Tomatoes, onions, cabbage, watermelons, and potatoes are the major vegetables produced, although almost all others are produced in smaller quantities. Oranges are the major fruit, followed in volume by dates, grapes and bananas. Smaller quantities of mangoes, guavas, and limes also are grown. Yields of most fruits and vegetables are relatively low but could be increased by improved seeds, fertilization, and better irrigation and cultivation practices.

The area devoted to these crops has increased substantially because of the relative absence of price controls. Most of the production is marketed domestically as fresh produce, although citrus exports have increased significantly, largely to East European

Table 2.–Major Egyptian Agricultural Imports and Exports, 1972-74 Average and 1975-77

[In 1,000 metric tons]

Item	1972-74	1975	1976	1977[1]
Imports:				
Wheat and wheat flour	1,942	3,202	2,762	4,345
Corn	181	418	459	601
Vegetable oils	132	370	195	226
Tallow	71	134	135	157
Sugar	41	172	204	230
Meat	13	19	86	95
Dairy products	6	19	38	42
Beans and lentils	19	151	131	111
Exports:				
Cotton	271	185	165	144
Rice	297	104	211	223
Oranges	164	210	170	171
Potatoes	95	48	158	166
Onions	100	70	71	88
Raw sugar	37	44	39	58
Cottonseed cake	34	38	27	13

[1] Preliminary.

Source: CAPMS, Cairo, and USDA, Economics, Statistics and Cooperatives Service estimates.

countries. Further increases in production will be needed to meet domestic demands but exports could increase with improvement in marketing and transportation systems.

Egypt's comparative advantage in production of fruits and vegetables, coupled with its proximity to both Arab and West European markets, creates a promising potential for substantial production expansion. However, success of such a strategy hinges on three major issues.

First, competition in Western Europe during the normal production period would be keen. Egypt would have to vie with exporters from many developed countries as well as several other developing countries, such as Israel, that have skilled marketers and are providing high-quality products.

The second issue is the capacity of the internal Egyptian production and marketing systems to produce the kinds of products in demand and to deliver--on precise time schedules–high-quality, standardized products at competitive prices.

The third issue is the reality of the strength of West European demand for certain products. Some Western exporters, for example, maintain that fresh citrus is already in oversupply.

A more limited and selective strategy may have merit. It would have two parts.

- Concentrate fruit and vegetable exports to surrounding Arab countries, although the size of this market may be limited.
- Pinpoint off-season markets in Europe.

Three examples illustrate the latter point. In citrus, the normal export period for Spanish oranges is October-May, as it is for Morocco, Algeria, Israel, and Italy. The off-season or summer market for oranges is filled by the United States beginning in March and running through June and July, and by Brazil and South Africa from May through September or October.

The volume of oranges traded in the off-season is less, and prices are higher. It seems possible, considering the similarities of climate and the practice of irrigation in Egypt and California, that Egypt could aim its harvest to the off-season market. For table grapes, Egyptian horticulturists believe that Egypt could deliver quality table grapes to European markets at least a month in advance of traditional suppliers.

Egypt has long produced a spring crop of potatoes for export to the United Kingdom, Denmark, and West Germany. However, it has had to reimport seed stock for the summer crop owing to a lack of cold storage facilities to provide the dormancy period needed for seed stock from the spring crop to germinate in the fall. The World Bank has proposed a project to provide such cold storage facilities and to produce standardized vegetable (especially tomato) seeds. Once this facility is in operation, off-season exports of potatoes could increase substantially.

Off-season production and marketing of tomatoes also may offer some potentials, but cooling, packing, and transportation facilities would need to be developed. Production for the winter market may need to

be concentrated in Upper Egypt to avoid low winter temperatures in the Delta, but transportation costs would be higher than from the established production areas. Air freight may be feasible for certain high-value products.

The small size of farms poses an additional obstacle to marketing improvements for vegetables and fruits. A large number of farmers would be needed to produce sufficient volume to justify the capital investment in marketing facilities and ensure a satisfactory return to producers. Production would need to be closely coordinated as to varieties to be planted; planting dates; and fertilization, irrigation, and other cultural practices to ensure high-quality and standardized products.

Several specialized cooperatives now exist to provide the coordinating mechanism for the production phase and to facilitate marketing. Now limited chiefly to potatoes and onions, the basic cooperative framework could be developed for other products with export potentials. Larger farmers who have sufficient land to specialize in vegetables would most likely form the nucleus of new cooperatives that might be organized.

The New Lands Dilemma

Mounting population pressures in the old lands, the need to increase food production, and the ample supply of water available from the High Dam provided the rationale for launching large-scale land reclamation projects in the 1960's. Such a program also was consistent with land reform efforts designed to improve the welfare of landless farmers and spur economic development of the country as a whole.

By 1975, 912,000 feddans were in various stages of development, at a cumulative cost of £E 485 million. More than one-half of the area earmarked for reclamation was undertaken in 1960-65 with assistance from the Soviet Union and Eastern Europe. Large-scale mechanized farms were laid out to be operated like those in the donor countries. Other areas were to be eventually turned over to individual settlers in 5-10 feddan units.

Lands selected for reclamation were chiefly of two types: (1) Within the Delta, where drainage was the primary requirement, and (2) desert lands on each side of the Delta and scattered areas along the Nile from Cairo southward to Aswan. The desert lands are significantly lower in inherent productivity than Delta lands, and require irrigation and drainage facilities, roads, and other infrastructure. Consequently, more time and money than originally anticipated has been spent to bring these lands up to the present level of production.

Except for small areas of reclaimed land from Delta lakes, the new lands have contributed little to domestic food requirements. Salinity and drainage problems have limited what can be grown to forage crops, barley and wheat, and small areas of citrus and grapes. Rice production is not feasible on sandy soil. Several cattle-fattening operations have been established to utilize the forage crops grown to improve soil structure for more profitable crops. Less than 200,000 feddans, mostly in the Delta, have been turned over to individual farmers. Another 200,000 feddans have been assigned to six public-sector farming companies, although only part of the area in these farms is fully developed. Portions may be available to establish agroindustrial complexes by foreign investors.

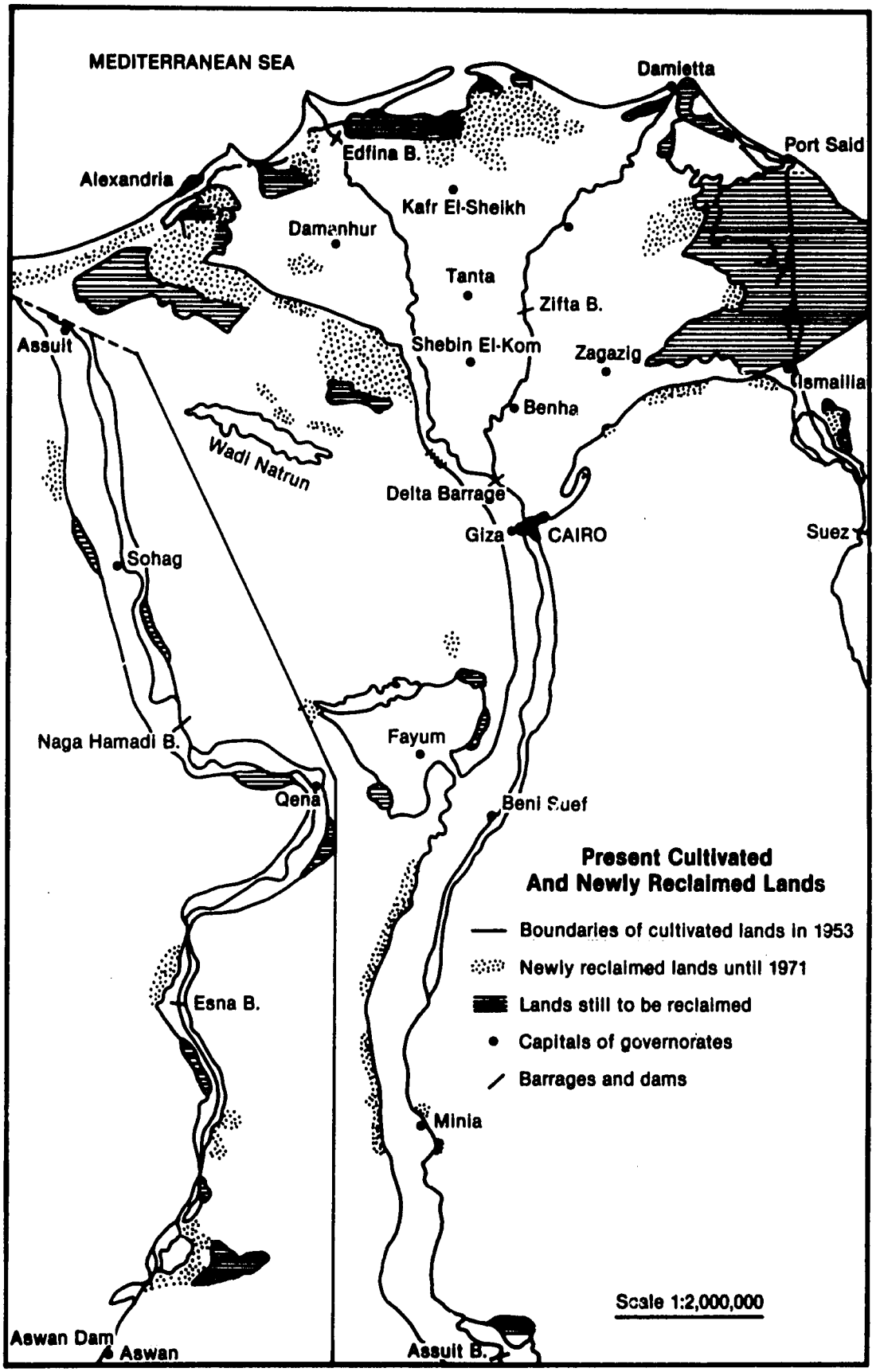
The Five-Year Plan proposes several strategies to speed up further development of partially reclaimed land and to transfer control to agencies or groups likely to use these lands more effectively than in the past. The reorganization of state farms into profit-oriented business units was initiated in 1976-77, but numerous problems still need to be resolved before the transformation is completed. Substantial portions of the land in these farms still require additional investment to complete the development process. Effective management incentives policies need to be established. Price controls on output need to be lifted or adjusted to permit profitable operations. According to GOE estimates, an additional investment of £E133 million or about £E350 per feddan will be needed before these lands reach profitable levels of production.

The Plan also lays out an ambitious program to reclaim an additional 2.0 million feddans by 1987. Some of these lands are adjacent to areas previously reclaimed, such as in Nubaria, but the bulk of the land is in new areas west of the Suez Canal, in the New Valley, and west of Lake Nasser. Projected costs for these projects total about £E2 billion, or an average cost of about £E1,000 per feddan. Nearly two-thirds of this cost would be required for leveling, drainage, irrigation, and infrastructure, and the balance, for the soil-building process—expected to span 5-10 years.

The Plan gives no indication as to sources of funds, the manner in which these projects would be carried out, or the kinds of crops that could be grown.

Fertilizer

Unlike many other countries seeking to increase crop yields by using more fertilizer, Egypt already is a heavy user of nitrogen and phosphate. Relatively little potash is used because the soils do not require it. Total consumption of fertilizer in 1975 was 175 kilograms per hectare, slightly more than in France but only a little more than half the amounts used in Japan. However, such comparisons can be misleading because there are few other countries in the world


MEDITERRANEAN SEA
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Zagazig
Ismailia
Benha
Wadi Natrun
Delta Barrage
Giza
CAIRO
Suez
Sohag
Fayum
Naga Hamadi B.
Qena
Beni Suef
Present Cultivated
And Newly Reclaimed Lands
Boundaries of cultivated lands in 1953
Newly reclaimed lands until 1971
Lands still to be reclaimed
Capitals of governorates
Barrages and dams
Esna B.
Minia
Scale 1:2,000,000
Aswan Dam
Aswan
Assuit B.

Table 3.–Egyptian Plans to Complete Land Development for Public Sector Farming Companies, 1978-80

Region	Total area	To be developed	Estimated cost
	Feddans	*Feddans*	*£E million*
West Nubaria	58,000	34,000	21.5
South of El Tahir	103,000	54,000	28.0
North of El Tahir	41,700	35,000	17.3
Mariut	70,200	54,900	26.7
San El Hagar and El Malak	99,700	19,000	5.9
Scattered areas	98,000	98,000	33.9
Total	470,600	294,900	133.3

Source: Five-Year Plan, 1978-82: General Strategy for Agriculture, Irrigation and Food Security. Preliminary draft, August, 1977.

Table 4.–Egyptian Plans and Costs for Reclamation and Development of New Lands, 1978-87

Region	Area	Estimated costs:		
		Reclamation[1]	Development[2]	Total
	Feddans	*£E mil.*	*£E mil.*	*£E mil.*
South of Nubaria	208,000	118.6	62.6	181.2
South of Port Said	487,000	267.9	203.3	471.2
New Valley, Lake Nasser	1,300,000	930.0	480.0	1,410.0
Total	1,995,000	1,316.5	745.9	2,062.4

[1] Includes leveling, irrigation and drainage, buildings, roads, electricity, etc.
[2] Machinery, annual production expenses for a 5-10 year period until land reaches marginal stage of development.

Source: Five-Year Plan, 1978-82: General Strategy for Agriculture, Irrigation and Food Security. Preliminary draft, August, 1977.

with as high a proportion of crops that are wholly irrigated. Fertilizer use is universally lower on nonirrigated lands. Even so, the supply and use of fertilizer is not a significant factor limiting crop yields in Egypt. However, it is a key input, substituting for more land where this alternative is not available.

Consumption of nitrogenous fertilizers has increased sharply in the past decade, and substantial imports, chiefly of urea, have been required. Five public-sector plants produce about one-half of domestic requirements, and two new urea plants are scheduled to come into production in 1980. Existing plants are obsolete and produce chiefly low-analysis ammonium and calcium nitrates. Three other plants produce low-analysis phosphate (P_2O_5), and a new plant is planned to produce a double-strength product.

Like other aspects of Egypt's agriculture, fertilizer and its use are under tight Government controls. The Ministry of Agriculture determines the appropriate rates of application for the major crops, with little variation among the various governorates and districts, or among individual farmers. Supplies move from central warehouses at the governorate level to local cooperatives for sale to farmers. All distribution and storage is the sole responsibility of the Agricultural Credit Bank, which provides credit for fertilizer purchases.

In general, the distribution system appears to work reasonably well, but delays in delivery to the local cooperatives, inadequate storage facilities, and losses in handling are continuing problems. Because the allocation system does not allow for preferences of farmers with respect to the rate of application on particular crops, or among crops, a substantial black market exists at prices well above official controlled prices. Fertilizer allocated for low-return crops like wheat and cotton is diverted to more profitable crops like berseem, vegetables, and fruits by means of this "second market."

The Government pricing policy has resulted in substantial subsidies and a drain on foreign exchange in recent years. Fertilizer prices to farmers are the same throughout the country for a given material, regardless of the costs of imports, domestic production, or distribution. During 1975-76, when world prices of nitrogenous fertilizers increased sharply, import subsidies totaled about £E100 million. Although such subsidies are likely to be phased out as additional domestic production comes on stream, there is still need for new pricing policies and relaxation of the present rigid allocation system so farmers can most efficiently use this important production input.

The full value of fertilizer can only be realized in conjunction with the upgrading and utilization of other inputs. This is especially relevant with respect to the extensive drainage projects now underway. A level of fertilizer use that is satisfactory for land seriously affected by waterlogging and salinity may be too low once the land is reclaimed and its productive potential restored.

Similarly, the introduction of high-yielding seed varieties usually requires a higher level of fertilization and possibly a different balance of nutrients than the varieties they replace. The introduction of new methods of land preparation and on-farm water management currently under study may also lead to changes in past fertilizer recommendations. Thus, although fertilizer is but one factor in the complex production system, it warrants a progressive, ongoing research program and an effective system to deliver the results to the farmer.

LIVESTOCK AND POULTRY

The **livestock** sector, except for public-sector poultry, has been long neglected in Egyptian agricultural policy even though it contributes about one-fourth of the total agricultural output and holds a key position in any effort to improve a diet heavily weighted with cereals. With every farmer owning two or three head of cattle or buffalo, primarily for field work, the output of meat and milk becomes difficult to organize into an efficient marketing system. Although several dairy and cattle fattening operations have been established as public-sector activities, they have not been successful in tapping the latent potentials of village livestock.

The 4 million head of livestock—about equally divided between cattle and buffalo—and 4.6 million head of sheep, goats, and donkeys must subsist on berseem clover grown in rotation with cotton and rice, and on plant residues during the summer. Cottonseed cake is in ample supply as a protein supplement, but domestic production of maize and sorghum is barely sufficient for human needs. With essentially no permanent grazing land, any diversion of cropland to forage or feedgrains competes directly with land needed for cotton and food crops.

Despite these problems, uncontrolled prices for livestock products have encouraged farmers to divert as much land as possible to berseem and perennial forage crops like Napier grass. This action runs counter to the general policy of maximizing production of food and fiber crops and creates pressures to develop a national livestock policy. This, in turn, raises additional policy issues regarding the appropriate kinds of mechanization. The Five-Year Plan recognizes these problems and places much emphasis on the need for mechanization to enable livestock freed from farmwork to produce more meat and milk.

However, independent studies have shown that the basic problem is too large a population of poor-quality livestock for available feed supplies. As long as demand for livestock products remains strong and price incentives exist, farmers are more likely to maintain or increase present numbers than to give up livestock that have become an increasingly profitable enterprise. Also, farmers will need to be convinced that mechanical power is as reliable as animal power, and that the additional cash costs will more than be covered by increased production resulting from mechanization.

Given these constraints, more meat and milk might be made available by strengthening or initiating several specific measures, such as:

- An accelerated program to improve the genetic quality of both cattle and buffalo through crossbreeding and selection;
- Provision of technical assistance and funds to extend the existing animal health care and genetic improvement program to more villages on a regular basis. Mobile vans stocked with veterinary supplies and frozen semen could provide useful services;
- Development of pilot programs in villages that have made progress in mechanization whereby animals no longer needed for farm work would be put into herds for meat and milk production. A substantial extension program would be required to demonstrate methods of more efficient forage production and improved animal husbandry practices. An incentive program might be needed initially to encourage farmers to pool their animals into village units. Such an undertaking would lend itself to a cooperative form of organization.

The **poultry** industry consists of three distinct segments: village flocks, the public sector, and the private commercial sector. About 80 percent of the poultry meat and 97 percent of the eggs produced come from village flocks. Although both products are of low quality, production costs also are low, utilizing

grain screenings of little or no market value and a minimum of labor and capital investment. Typical flocks of 25-50 birds provide cash income to the family and supplement the predominately cereal diet.

With the increase in urban income levels, demand for poultry meat and eggs prompted the Government to undertake commercial broiler production in 1964. A fully-integrated system similar to that in Western Europe and the United States was planned, with the goal of producing 50 million broilers by 1980. Subsequently, in 1972, a similar plant was built to produce eggs, with a goal of 200 million by 1980.

Actual performances of both public sector activities have fallen far short of expectations. Numerous problems arose, ranging from erratic and often-inadequate supplies of chicks and feed and lack of management incentives to retail prices fixed below production costs. Although the State-controlled General Organization for Poultry recently has been reorganized as a company to be operated for profit, the basic problems of technical management and the supply and coordination of chicks and feed remain. The Five-Year Plan was especially critical of the past performance of public-sector poultry operations. It recommended that the sector's function be redirected to providing chicks, feed, and marketing assistance to the private broiler growers, rather than to further expand direct production.

The rapid expansion of broiler production in the private sector in recent years demonstrates that investment capital and entrepreneurship can be attracted to activities that are relatively free of Government control. The number of producers was estimated at about 8,000 in 1977, and several thousand additional applications to build broiler units were pending. However, private producers are still primarily dependent upon Government-operated hatcheries and feedmills. Nevertheless, much of their output can be sold on the free market at prices substantially higher than those set by the Government. The private sector has now reached the size that it can seriously consider setting up its own support facilities and developing a more competitive marketing system than now exists.

Although the market has been able so far to take the substantial increase in output from the private sector at increasing prices, there is some concern that overproduction may occur if expansion continues at the rapid rate of the past few years. The additional units being built now are relatively small, but several large factory-type broiler and egg operations are being considered as potential agribusiness ventures by foreign investors. Just a few such units could greatly increase total supply and depress prices for all producers. The success of such ventures is likely to depend more on their ability to develop export markets to nearby Arab countries than to compete with smaller scale private growers for the domestic market. Substantial capital investments in feedmills, hatcheries, and slaughter plants will be needed for the large factory-type units, as well as management overhead that the smaller scale producers do not have.

The GOE, with AID assistance, is currently in the process of resolving the issue of large versus small-scale production, and the appropriate role for the Government in the poultry industry. A general study has been completed, and outside managerial and technical assistance is helping the poultry company expand its capacity to deliver high-quality eggs and chicks to village hatcheries and farm flocks. Also proposed is an accelerated program of poultry breeding, domestic production of vaccines, pharmaceuticals, and feed additives for distribution to both village and commercial-scale producers.

However, additional efforts will be needed to develop a more efficient marketing system for both eggs and broilers. And the industry will remain dependent on imported feedgrains currently being supplied under U.S. assistance programs. How well the industry will fare in the future if foreign-exchange needs for grain imports compete with other imports remains to be seen.

MECHANIZATION AND LOW COST TECHNOLOGY

Better or more efficient means for increasing the output of goods and services and increasing employment lie at the heart of economic development efforts in all developing countries. Whether these goals are to be achieved by "low cost," "appropriate," or "best available" technologies is of less concern than the need to identify and implement the specific technologies most compatible with the existing levels, the relative costs of capital and labor, and the priorities held by individual decisionmakers and the Government as a whole.

Technology is a many-faceted concept that may refer to a single means for achieving a specific end result or may involve a package of practices that interact to produce a synergistic effect. Such effects are especially relevant in agricultural production, where the selection and proper application of several specific technologies may be needed. The best available technology for a specific crop will involve seedbed preparation, seed selection, plant population, rate and placement of fertilizer, insect and weed control, amount and timing of irrigation water, harvesting methods, and storage to minimize losses.

The search for better technologies needs to extend beyond the production level to include grading,

packing, shipping, processing, and eventual distribution to consumers. Identifying and developing appropriate technologies throughout a commodity system is as essential as those at the production level because all components of the system should be aimed at the single task of providing the kinds and amounts of food needed for expanding populations.

Progress and Problems

If technology is defined simply as the way of doing things, Egyptian agriculture is a prime example of low-cost technology. The Egyptian farmer has a minimum investment in tools and uses low-cost and abundant labor with abandon. Nor does the food system in Egypt—which encompasses farmer inputs, production, processing, and distribution—employ technology to full benefit. At some points in the food system, available technology is not widely adopted. In other instances, dual systems of traditional and modern techniques are found side by side.

At the farm level, the substitution of mechanical for human and animal power offers numerous opportunities. Many days now spent performing tasks by human or animal labor could be accomplished in much less time with relatively inexpensive tools and equipment. The use of human power to lift water from irrigation ditches or to cut rice and wheat with a sickle are just two examples of labor-intensive technologies that reduce the marginal productivity of labor to near zero.

While the combination of small amounts of capital in the form of mechanical devices to perform such tasks would not significantly increase total output, it would reduce human drudgery and enhance the quality of life. Laborers released from low-productivity tasks could then become available for more productive employment. Thus, a step upward in the progression toward more advanced technology may be justified, even though initially there are no other tangible benefits.

There are marked differences of opinion among Egyptian and foreign observers regarding the supply-demand balance for farm labor, and hence the probable impact of mechanization on employment. Farm wage rates have increased sharply in recent years, and shortages are reported during periods of peak labor requirements. The high rate of rural-to-urban migration may be due to limited employment opportunities on farms as well as the higher wage rates available. However, higher birth rates in rural than in urban areas insure substantial numbers of workers entering the rural labor force. But many cannot find off-farm employment opportunities. The net effect of such opposing forces on the farm labor supply cannot be determined with certainty.

In any event, the rate of adoption and the particular kinds of new technology used to replace farm labor must be carefully evaluated if widespread unemployment is to be avoided. Specific technologies that replace animal power, such as land tillage, have less impact on labor requirements than those directed at harvesting operations. But equipment to perform more accurate seeding and placement of fertilizer will significantly increase crop yields without a significant adverse effect on labor requirements.

Identifying and implementing the most appropriate production technology is complicated by the small size of Egyptian farms, limited capital resources, and the low level of technical skills. Much of the farm equipment developed in the United States and in other advanced countries is too large or too expensive and requires skills for operation and maintenance that are too complex for adoption without extensive training. This latter problem is being overcome by the emergence of custom operators who provide machinery services to farmers—a practice widely used in the United States. Some Egyptian cooperatives also provide tractor services, but their performance is not as good as that provided by individual entrepreneurs.

Although there is a strong temptation in any country to modernize its agriculture as rapidly as possible, the most advanced technology available may be wholly unsuited to local conditions. Efforts in the less developed countries to bypass the long development period in farm mechanization that occurred in advanced countries have resulted in numerous failures in the past.

Egypt's experience with highly mechanized state farms using equipment from the USSR and Eastern Europe illustrates the problem. Much of the large-scale equipment placed on these farms is now idle due to lack of maintanance and spare parts. Related problems included the lack of incentives to management and inability to carry out appropriate techniques of soil and water management. The attempt made to apply a package of technologies was too complex for the level of skills available to implement them.

Operations on the state farms were further hampered by the large amount of labor that had to be employed for social and political reasons. About 200,000 fulltime and seasonal laborers were used on 775,000 feddans under cultivation in state farms in 1975, according to the Five-Year Plan. This is an extremely high labor input, considering the amount of capital involved in mechanical equipment.

Opportunities for Change

Egypt appears ready for widespread adoption of mechanical devices in production and handling of farm commodities. Without a policy to direct the character and pace of this transformation, however, there is danger of dissipating scarce resources that

might be better utilized for other purposes. General guidelines found useful in other countries that have faced similar adjustments include:

- Modest, low-cost devices—rather than large, costly power units—are preferable in developing countries where small farmers predominate.
- On the production side, farmers should be free to select, modify and maintain their own farm equipment, with the Government's role limited to education, facilitating the flow of materials, and extension of credit.
- On the manufacturing side, native skills in the private sector should be allowed maximum latitude to respond to farmer demand and should not be subjected to artificial constraints.
- Use of tractor power, as it gains momentum in a small-farm economy, generally should be guided toward private custom operations. Exceptions would be the use of larger equipment in public projects, such as building or rehabilitating an irrigation system or new road construction.
- Credit, available in sufficient and timely quantities, is critical to the transition; funds for medium-term loans are especially important.
- Maintenance, or the lack of it, will make or break any mechanization program. While Government has a responsibility for providing mechanical training and ensuring a smooth flow of imported spare parts and raw materials, the ultimate burden for maintenance rests with the farmer or the custom operator whose investment is at stake.
- Either as a function of the manufacture and servicing of farm machinery or through planned, parallel rural development projects, alternative employment opportunities must be developed to absorb displaced farm labor.

Egypt has the capacity to meet each of these requirements. Its farmers are alert and responsive to new technology and capable of acquiring new skills. The village blacksmith or his more sophisticated successor is present everywhere in Egypt and already has demonstrated a facility for fabricating improved implements. Custom tractor operators are springing up throughout the Delta, and the first results indicate that they and their clients enjoy a mutually satisfactory relationship. Credit arrangements show a degree of first-stage workability, but more funds—better administered—are an obvious need. Maintenance is a function of training and experience. With a little planning, both can easily be provided.

Table 5 illustrates current practices and indicates the direction of change that is feasible and desirable for the mechanization of Egyptian agriculture. At each stage of a farm operation, specific low-cost equipment and practices may be applied with a minimum of social and economic disruption. With the exception of tractors, which can be assembled in-country, each item on the list may now be manufactured from scratch by the existing body of artisans.

Compiling a list of priorities for local manufacture requires more experimentation and testing than has been conducted so far. It is apparent, however, that stationary threshers, hand sprayers, land scrapers, animal and tractor-drawn tillage equipment, and small pumps and engines are all within the range of Egyptian mechanical capabilities. The lead time in implementing the design and production of these devices, once identified as feasible, should be minimal.

In this movement from old to new techniques, outside technical assistance by AID can render a genuine service, not only in the tangibles of development but in counseling the GOE in the formulation of governing policies.

POTENTIALS FOR AGRIBUSINESS

The passage of Law 43 in June 1974 marked the beginning of a concerted effort by the GOE to encourage foreign investment in the Egyptian economy. The law specified new policies with respect to taxation, employment practices, repatriation of profits and capital, and related matters. Also authorized were the establishment of free-trade zones and joint ventures involving Egyptian and other foreign firms. Among the types of investment favored in the legislation were livestock industries and the reclamation and cultivation of barren lands under long-term leases.

Several deficiencies in the original law resulted in a number of amendments incorporated in Law 32, which was passed in mid-1977. An inequity in the original law pertaining to different exchange rates for capital brought in and taken out of the country was corrected, and several features of the tax provisions were modified to encourage foreign investment further. Review and approval of projects have been speeded up, and public sector firms—often heavily subsidized in the past—are less likely to compete directly with foreign-financed ventures.

Although a number of U.S. and other foreign firms have arranged to undertake manufacturing and banking activities, no significant amount of capital has been committed to agricultural projects. According to official GOE data as of June 30, 1977, 45 inland projects (excluding those in free zones) had been approved, but only four were in agriculture. None of these were in actual production although one was in the process of implementation.

The Egyptian Government has actively solicited American and other foreign firms to undertake projects to produce, process, and market fruits, vegetables, sugarbeets, poultry, and dairy products.

Table 5.–Egypt's Stages of Mechanization in Crop Production on the Old Lands

Operation	Present practice[1]			Direction of change
	Hand	Animal	Mechanical	
Land preparation:				
Plowing, discing		XX	X	Wider use of medium size tractors, moldboard plows, subsoiling
Land leveling, ditching	X	XX	X	Specialized equipment for animal, mechanical power
Water pumping, distribution	X	XX	X	Diesel, electric powered pumps, levelers, ditchers
Seedbed preparation	X	XX	X	Better harrows, discs for animal, tractor power
Planting:				
Cotton, maize	X		[2] XX	Mechanical planters for corn, higher plant populations
Wheat	XX			Replace broadcasting with row planting
Rice (Most of the crop is transplanted)	XX			Row planting, controlled fertilizer placement
Fertilizer distribution	XX		X	Planting equipment with fertilizer attachment
Cultivation:				
Weeding	XX			Small garden-type tractors, especially for vegetables
Chemicals	X		[3] X	Portable spray rigs with mechanical pumps
Harvesting:				
All crops	XX			Harvesting machines for animal, mechanical power
Hauling, field to village		XX	X	Wagons, sleds in place of backs of donkeys, camels
Threshing:				
Grain separation		XX	X	Small threshers powered by stationary engines or tractors
Grain cleaning	XX		[4] X	Small grain cleaners, mechanical power

[1] Most common practice indicated by XX, less frequent practice by X.
[2] Row planters combined with fertilizer distribution for cotton.
[3] Some hand operated and mechanically-powered equipment used for spraying.
[4] Rice, flour mills clean grain before hulling, milling.

Several non-U.S. firms have initiated projects to produce sugarbeets, beef, and dairy products. A major U.S. firm recently signed an agreement to develop a large citrus production and marketing facility.

The Agribusiness Council–a nonprofit organization based in New York[1]–also has been alerting American agribusiness firms to possible projects and bringing together Egyptian officials and executives of such firms. Several U.S. consulting firms also have been active in preparing initial proposals for potential projects.

The proposed sites for such projects include partially developed desert lands on both sides of the Delta and along the Suez Canal; lands requiring drainage within the Delta; and smaller areas along the Nile from Cairo southward to Aswan. Additional sites have been proposed in the New Valley and on the west side of Lake Nasser, where water could be obtained from the lake or from underground sources. Most of these sites would require substantial capital investments in irrigation and drainage systems, roads, housing, and other infrastructure.

Although U.S. and other foreign firms have considered several of the sites available, the lack of sound feasibility studies has discouraged actual commitments. Basic data on soil productivity, development costs, irrigation and water management practices, and the suitability of the soils for various crops are needed to identify economically viable projects. The lack of such data results in substantial risk, which also is inherent in determining the size and characteristics of export markets needed to generate foreign exchange. These considerations are especially relevant for projects involving fruits and vegetables for which only limited export markets now exist.

The combination of high risks and development costs which are likely to extend over several years tends to discourage all but the largest firms from

[1] The Council's membership includes some 80 major corporations from all segments of agricultural production and development, food processing, and allied industries. The Council works closely with the Overseas Private Investment Corporation which insures and helps finance private American investment in developing countries.

undertaking agribusiness projects that involve production on new lands.

In addition, difficulties have been encountered in finding Egyptian businessmen with sufficient capital and management expertise to engage in viable joint ventures. Those that have investment funds are more likely to engage in foreign trade, construction, or manufacturing than in agricultural ventures.

An alternative for prospective foreign investors is to explore the potentials of joint ventures with former public-sector firms that now are operating with some degree of freedom from Government controls. The extent of such independence, especially with respect to price controls, would need to be determined before commitments were made by the foreign firm.

Another major issue not yet resolved is whether the GOE—or the foreign investor—is to bear the costs of bringing reclaimed land up to a profitable level of production, as well as the costs of infrastructure. These are essentially nonrecoverable costs if the venture proves to be unprofitable to the foreign investor; yet they have some value to the domestic economy or to a new firm that might wish to take over the project. So far, the GOE has not been willing to offer any significant amount of additional funds to develop projects being considered by foreign investors.

Although partially reclaimed desert lands have received most of the emphasis thus far in agribusiness planning, there may be greater potential in stimulating production of specialty crops on old lands for processing and/or export. Alluvial soils in the Delta, including those not now in production because of drainage and salinity problems, generally are considered better suited for vegetables and other intensive field crops than the desert soils. This is evident especially in the established vegetable areas near Alexandria and Cairo, where most of the production now goes to local markets. Although some processing, chiefly of tomatoes, is done, supplies are erratic and too variable in quality to support efficient processing plants.

Coordinating output of many small producers presents organization and management problems, which—while difficult—do not appear impossible. Such an undertaking could be facilitated by locating a processing and packing facility on reclaimed Delta land adjacent to an established farming area. This base unit would function as a pilot project to develop appropriate production practices and determine costs.

It also would serve as a demonstration site to encourage farmers to enter into production contracts with the processing plant. Initially, only the larger farmers would likely be receptive to such an arrangement, but eventually other farmers might become involved if profit potentials were attractive. In any event, controls would be needed to produce uniformly high quality products at the right time of the year in order to realize favorable prices in off-season export markets.

Farmers participating in such a venture could be organized as a cooperative, but outside expertise would be needed, at least initially, to develop an efficient operation.

Management contracts and joint ventures with either Egyptian or other foreign investors provide alternatives to direct equity investment in agribusiness ventures. Suppliers of equipment needed for irrigation or in packing and storage facilities could provide part of the capital, and a specialized marketing firm could perform this phase of an integrated operation. Actual field operations could be the responsibility of still another firm.

AID has programmed funds to finance agribusiness projects in each of the past 2 years, but none had been approved as of late 1978. Funds would be made available through an industrial credit bank for approved projects, which would then be loaned to firms or organizations undertaking specific projects. An equity contribution would be expected from the American firms involved, or from the joint venture with Egyptian or Arab investors.

Such loans could be used to construct irrigation systems, farm equipment, processing and packing facilities, warehouses, freezing and cold-storage facilities—as well as production of fruits, vegetables, poultry, and meat products—on partially developed lands available from the Egyptian Government under long-term leases. Potentials also may exist on lands in the Delta now idle because they require drainage.

Only one project has been proposed thus far for AID financing, but a more detailed feasibility study is needed to determine if it is a viable project. The project, involving citrus production, has raised Congressional concern that it might compete with U.S. exports to West European markets. However, Egyptian production is not now entering this market and is more likely to move to Middle Eastern markets for the foreseeable future.

Apart from citrus, potentials exist for producing other fruits, vegetables, and livestock products that are labor-intensive and provide additional opportunities for established farmers. Considerable capital investment would be required to initiate such projects, but once established they would provide additional employment in grading, packing, processing and transportation of the output. High priorities should be given to those projects most likely to increase exports and foreign exchange earnings or meet critical domestic food needs.

In view of the numerous unresolved issues surrounding most of the proposed agribusiness projects—particularly the unproven productivity of much of the land available—the GOE, possibly with AID support, could take several steps that would help

implement its stated policy. Among these are the following:

- Provide a comprehensive inventory of the various sites being offered, including all available data pertaining to soil type, source, and proximity of irrigation water; extent and adequacy of existing infrastructure; availability and cost of labor; and other related data.
- Provide objective data as to actual operating results on public-sector farming operations on reclaimed lands, including cumulative investment costs to date, estimates of additional funds needed, and the time required to bring the land up to a profitable level of operation.
- Designate special areas of partially reclaimed land where Egyptian and foreign technicians could experiment on field-size plots to obtain objective data on irrigation and production practices, yields, and probable production costs.
- Provide as much detail as possible regarding the general terms and working relationships that would apply if a foreign firm were to enter into a joint venture with a public-sector farming or food-processing enterprise. This statement should include each party's contributions in equity capital and management, the allocation of output between domestic and export markets, the pricing system for both inputs and outputs under which the joint venture would operate, and other general rules and policies affecting the venture's success.

COOPERATIVES[2]

The first evidence of an Egyptian cooperative movement, in the Western European pattern, appeared in 1908. A Cooperative Department was established in the Ministry of Agriculture in 1923, and a succession of legislative acts culminated in the 1976 establishment of the Principal Bank for Development and Agricultural Credit.

Originally operated along conventional lines, with control by their membership, most cooperatives were drafted by the Government in 1952 to aid in implementing land reform. A decade later, they had effectively become an extension of Government, with their principal functions being to enforce quotas and crop rotations and to collect payment for such inputs as seed and fertilizer. Cotton, wheat, and sugarcane production now are rigidly controlled through the cooperative system and its elaborate overhead structure.

[2]This section is based on a report prepared by Job Savage, a consultant for the Cooperative League of the USA (CLUSA), who traveled through the rural areas of Egypt for several weeks in November 1977 observing the operations of farmer cooperatives.

Of some 5,700 cooperatives, more than 5,000 are essentially Government-enforcement agencies. The rest—designed to serve the growers of fruit, vegetables, potatoes, livestock, and special commodities—are relatively free of Government domination. A recent survey shows a wide variation in functions among all categories of so-called cooperatives; some provide a range of services from technical production to assistance in marketing, while others are highly specialized. For the basic crops, central control is maintained through election procedures requiring that a national director be represented on all branches, from the village level upward.

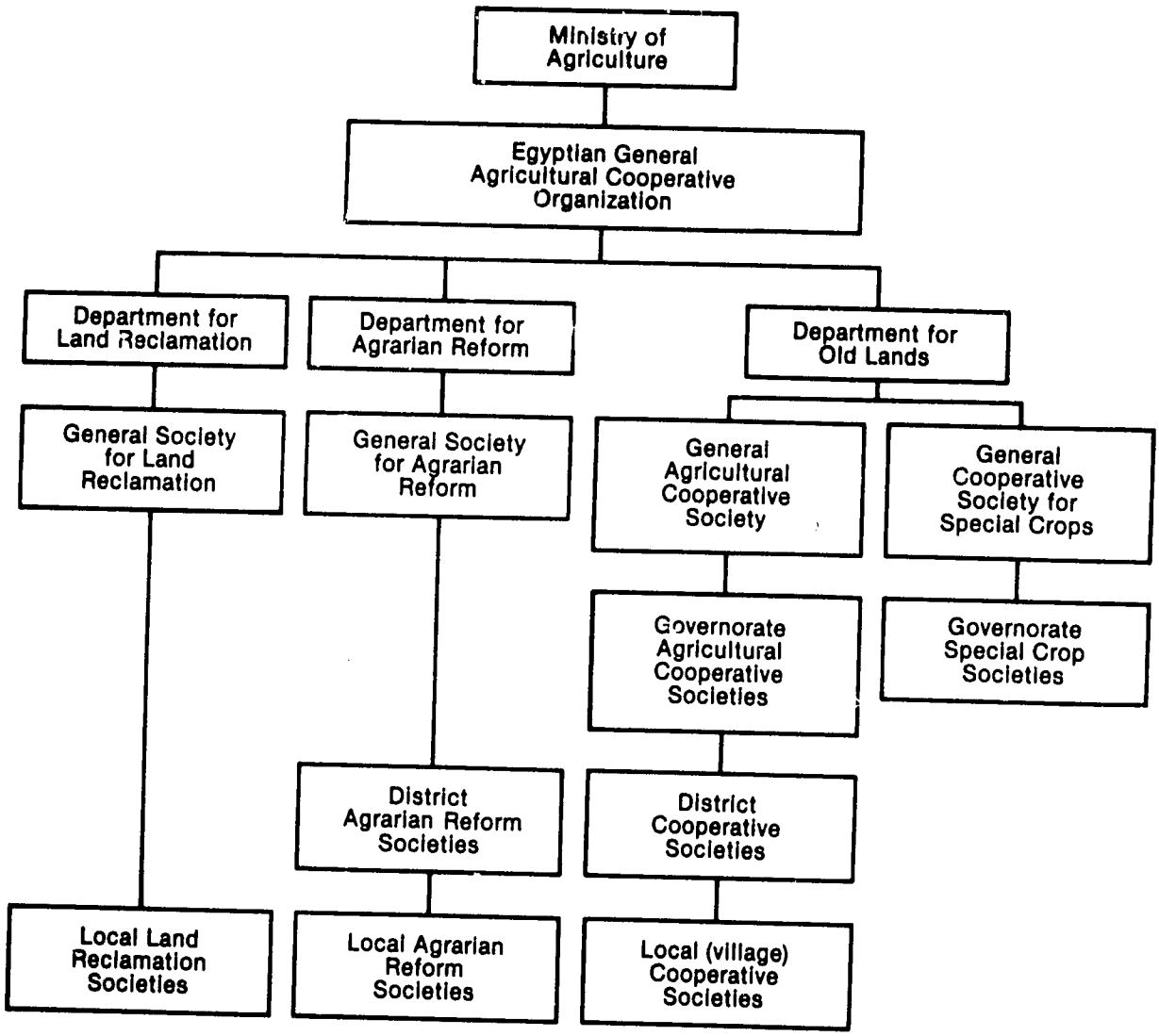
Egyptian farmers are conscious of a need to have a voice in their own cooperative affairs. This was demonstrated by the creation of the Central Agricultural Cooperative Union, "an apex organization representing the rights and powers of agricultural producers at each level of the Egyptian Government." The Union undertook to consolidate the principal functions of conventional cooperatives with those directed to agrarian reform, land reclamation, and other specialized activities. It was to train the leadership and staff on methods of handling credit, supplies, marketing, and related services; to participate with the Ministry of Agriculture in planning activities; and to represent the cooperatives in national, regional, and international affairs.

Because of certain irregularities in the organization, the Central Agricultural Cooperative Union ceased operations in 1977, and its present status is unclear. What is apparent, however, is that the Union, or its equivalent, can perform an essential service in modern cooperative movements and that its reinstatement in some form would be highly desirable. The complexity of the present structure is partially illustrated by Figure 2 which omits certain features of the overall organization that are in a state of flux.

With the exception of the societies for special crops at the Governorate level, all of the blocks in the chart represent Government organizations, not true cooperatives. In the villages, a board of directors is elected by the general assembly of members, but much of the power resides in a manager who is selected from a list of candidates provided by the Ministry of Agriculture. The manager can overrule a board's decision, although the board may appeal or complain to the district cooperative supervisor—who also is a Government appointee. Finally, a manager may be authorized by the board to hire employees at the cooperative's expense; in practice, however, Government employees generally outnumber cooperative employees by about three to one. Thus in all important respects, a majority of the cooperatives are *de facto* instruments of government.

Egypt's special crop cooperatives, in contrast, bear a closer resemblance to the type of cooperatives familiar to the western world. Basically autonomous,

Agricultural Cooperative Structure In Egypt, 1977[1]



[1] Because the Union (private sector part of the cooperative structure) is not functioning at the present time, it is not shown on the chart.

these special cooperatives elect their own boards of directors, and hire and pay their own managers and employees with a minimum of Government interference. Limited Government involvement does arise in connection with import or export regulations and, in some instances, price controls. Outward indications are that the special cooperatives are operated at markedly higher levels of efficiency than are their Government-directed counterparts. Much of their significance is in their demonstration that farmers can run their own associations better and at less cost than can the Government.

Although the survey of Egypt's cooperatives was not conducted on a scientific basis, it uncovered a number of issues that are indicative of farmer attitudes toward their multipurpose cooperatives. For example:

- In at least one district society, the directors are undergoing special training to prepare for eventual local takeover and control of cooperatives as private organizations.
- Hopes were expressed that ORDEV would be able to supply funds for projects as varied as road construction, poultry enterprises, and rural electrification.
- Marketing services, especially for the perishable crops, were considered unsatisfactory by farmers.
- Farmers were critical of other cooperative services, including an increased rate of interest being charged them, delays in handling supplies and paying for crops purchased by Government, and the lack of medium-term credit.
- Import and export controls, as well as price ceilings, were considered to be excessively burdensome by the farmers.
- There appeared to be a strong demand for: Tractors, spare parts, and related farm equipment; more livestock for milk and fattening for slaughter; more medium-term credit; more fertilizer, especially phosphate and potash; cheaper labor (farm wage rates were reported to have tripled in the last 2 years); and more local storage, especially for tomatoes and other perishables.

A second study made in late 1977 focused mainly on procedures of the Principal Bank for Development and Agricultural Credit, which is now the umbrella organization for the Government-sponsored network.[3] The main findings may be summarized as follows:

- Improved storage facilities for all farm commodities, with the possible exception of potatoes, are needed throughout Egypt.
- Office equipment and supplies are either in short supply or nonexistent; hundreds of thousands of transactions are handled without even the benefit of adding machines.
- Transportation for the principal officers of the cooperatives is a prime need.
- In-service training of the staff of cooperatives is inadequate.
- The "loan package" (seed, fertilizer, and similar supplies) is foisted on farmers according to an average regional formula without regard to individual farm requirements.
- A "thrift plan" to mobilize rural savings should be instituted in the village banks.

CREDIT[3]

In the past, most of the credit and inputs required by the farmer were supplied by the Agricultural Development and Credit Bank (ADCB). ADCB's lending operations are a critical feature of farm production in Egypt today. A report by the International Fertilizer Development Center (IFDC) describes these operations as follows:

> As now applied, agricultural credit covers short- (up to 14 months) and medium- (up to 10 years) term loans only. Short-term loans are either in cash or kind to cover requisites such as seed, fertilizer, pesticides, pest control equipment, animal feedstuffs and bagging. Cash loans are confined primarily to cotton, sugarcane, rice and orchards, with minor amounts going to maize, onion, wheat, and flax. Medium-term loans cover the purchase of farm machinery or livestock, development of new orchards, and land reclamation.
>
> In addition to supplying credit, the ADC banks in the governorates play a major role in the supply, transportation and distribution of all agricultural requisites to cooperatives. In the case of seed, for instance, while the Seed Department of the Ministry of Agriculture handles all the technical aspects of seed production, the ADC banks finance the purchase of seeds and assume responsibility for distribution of seed to cooperatives. Similarly, while responsibility for determining the kinds and amounts of fertilizers and pesticides is the responsibility of the technical departments in the Ministry of Agriculture, the ADC banks finance the entire operation of importing from abroad, securing local production and paying the appropriate subsidy to the producers and providing the subsequent transport and distribution to the agricultural cooperatives; pesticides and gypsum are handled in a similar manner.
>
> The ADC banks averaged loans of 78.6 million Egyptian pounds annually during the

[3] Based on a preliminary report prepared by Dennis C. Frederickson, Agricultural Cooperative Credit Specialist, Cooperative League of the USA.

1971-75 period. More than 98 percent of this was short-term credit with fertilizer, insecticides, and seed accounting for 45 percent, 11 percent, and 9 percent, respectively. Cotton was by far the major crop for which credit was given, accounting for 47 percent of the total, with wheat, rice, and maize accounting for another 34 percent. The majority of the remaining 19 percent was directed to sugarcane leaving little credit for use on crops that give the farmer the greatest net return.

While a more detailed study of agricultural credit is needed, credit supply does appear to be a factor limiting agricultural production. The total supply of credit available to agriculture has not increased greatly over the past 4-5 years. While the majority available does go to financing key inputs such as fertilizer, seed and pesticides, these loans appear to be directed primarily towards cotton and to a less degree wheat and rice. These are the crops least profitable to the farmer.

Under the heading of "Government policies affecting food production and fertilizer," a statement follows which confirms the conclusions advanced elsewhere in this report:

> For nearly 20 years the Egyptian Government has followed a deliberate policy to have agriculture help foster industrial development and, at the same time, create employment for a large share of the total population. This was achieved by establishing very low prices for agricultural outputs, particularly those destined directly for export or indirectly for use as low-cost raw materials to the industrial sector. The farmer's losses in potential earnings were partially offset by heavy governmental subsidies on key agricultural inputs such as fertilizer, seed, and pesticides, plus cheap credit particularly for those crops destined for the export markets. The government controls this output by collecting the produce through government cooperatives.
>
> Under this system, agriculture has not received its fair share of government investment. For example, little has been done to mechanize agriculture. As a result, forages (clover) used mainly for draft animals compete heavily for use of the land, accounting for more than 25 percent of the total land available for cultivation. What investment does occur goes mainly to reclaimed lands which are farmed as large mechanized commercial operations, but produce a disproportionately low amount of total crop production.
>
> As a result of these policies, major problems have begun to develop. Prior to 1967, growth in agriculture averaged a respectable 3.5 to 4 percent annual increase. Since then overall growth has slowed to less than 2 percent. Other indicators are equally evident and openly discussed by Egyptians. For example, while farmers are required to grow cotton to support the textile industry, or meet direct export quotas, they do so only to avoid strict penalties. Where possible farmers divert inputs intended for use on wheat, rice, or cotton for such crops as vegetables, fruits, maize, and clovers where prices are not controlled and profits much more attractive. Even where inputs must be applied, such as on cotton, the farmer will often delay plantings by 2-3 weeks, just to get that extra cutting and profit from the nonregulated crops (berseem clover as an example). As a result, yields for cotton, rice and wheat have not climbed as rapidly as could be the case. Profits are down and the country loses a given foreign exchange forever.

Table 6.—Distribution of Agricultural Credit in Egypt by Type of Loan, Input, and Major Crops, 1971-75 Averages

Item	Amount	Distribution
	£E million	*Percent*
Loan:		
Short term	78.6	98.5
Medium term	1.2	1.5
Total	79.8	100.0
Input:		
Seeds	7.3	9.3
Insecticides	8.5	10.8
Fertilizer	34.9	44.4
Other	[1] 27.9	35.5
Total	78.6	100.0
Crop:		
Cotton	35.9	47.9
Wheat	10.1	13.5
Rice	8.3	11.0
Maize	7.5	10.0
Other field crops	9.3	12.4
Onions	0.6	0.8
Vegetables and fruits	3.3	4.4
Total	75.0	100.0

[1] Chiefly cash loans to growers of cotton, sugarcane, and fruit.

Source: Agricultural Development and Credit Bank, and cited in the "Fertilizer Situation in Egypt," a report of the International Fertilizer Development Center, Jan. 1978.

Table 7.–Costs and Net Returns to Egyptian Farmers from Key Agricultural Crops, 1974

[In Egyptian pounds per feddan]

Crop	Fertilizer cost	Pesticide	Total production cost[1]	Rent	Value of output	Net return[2]
Wheat	7.74	0	26.67	15.52	56.00	13.81
Cotton	12.96	8.52	51.23	25.27	105.75	29.25
Beans	1.67	1.45	21.23	15.50	48.62	11.89
Rice	9.33	0	38.87	11.90	64.25	13.48
Maize	13.97	0	32.46	12.58	65.76	20.72
Sugar	16.10	0	59.60	22.27	150.22	68.65
Berseem (main crop)	(3)	(3)	32.00	17.00	120.00	71.00
Berseem (catch crop)	(3)	(3)	13.00	7.00	42.00	22.00
Oranges	(3)	(3)	(3)	(3)	(3)	100-250
Grapes	(3)	(3)	(3)	(3)	(3)	100-150
Tomatoes:						
Traditional method	(3)	(3)	50.00	17.40	180.00	150.00
Wire method	(3)	(3)	(3)	(3)	300.00	200.00
Watermelons	(3)	(3)	84.00	17.50	200.00	100.00

[1] Includes land preparation, seeds, sowing, thinning, and weeding plus irrigation.
[2] Includes cost of rent in calculation; however, in some instances inclusion of rent may not be correct comparison.
[3] Not available.

Source: Agricultural Research Center, Ministry of Agriculture, reproduced in "Fertilizer Situation in Egypt," a report by the International Fertilizer Development Center, Jan. 1978.

COMPONENTS OF THE U.S. ECONOMIC ASSISTANCE PROGRAM

The major thrust of the U.S. economic assistance program for Egypt has been to provide foreign exchange through concessional loans and grants for Egypt to purchase commodities and capital goods needed to upgrade its agricultural, industrial, and service sectors. These funds have been channeled through several different programs: (1) Capital development projects involving financing of new plants, port facilities, and communication systems; (2) commodity imports, chiefly machines, equipment, and raw materials; (3) the Food for Peace program (P.L. 480) which has financed the purchase of large quantities of wheat and wheat flour, other food products, and tobacco; and (4) technical assistance projects, which usually include provisions for training and purchase of commodities needed to carry out the project.

Most of the commodities and capital goods are purchased from U.S. suppliers by the various Ministries and public-sector agencies. Only a small fraction of the total dollar credits have been made available to the private sector. However, a Development Industrial Bank has been established–with funds provided by AID and the World Bank–to expand credit services to the private sector.

The agriculture and food sector received about one-third of the total funds authorized during fiscal 1975-77. Most of these funds were for food items shipped under P.L. 480. Shipments of wheat and wheat flour averaged 1.6 million tons annually in 1976 and 1977. Shipments of corn, averaging more than 500,000 tons annually, also were made in each of the past 3 fiscal years. Total value of all P.L. 480 shipments exceeded $200 million in fiscal 1978. Additional food shipments were made in fiscal 1977 under the commodity import program, as well as substantial quantities of tallow, corn, and equipment for food processing. However, most of the purchases under the commodity import and capital development programs were made for the nonagricultural sector.

Only 10 percent of the total allocation of $95 million for technical assistance projects in 1975-77 was directly related to agriculture, although this proportion is estimated to have increased to about 30 percent in fiscal 1978.

Initial steps were taken in 1976-77 to develop a number of projects designed to increase crop and poultry production. These projects will be implemented in fiscal 1978 and later years. This apparent lag is inherent in technical assistance projects in agriculture, but efforts are underway to speed up the process.

Table 8.–Economic Assistance to Egypt, by Major Programs and Sectors, Fiscal 1975-77, Estimated 1978, and Proposed 1979[1]

[In millions of dollars]

Sector and fiscal years[2]	Technical assistance	Capital projects	Commodity imports	PL-480[3]	Total
Agriculture:					
1975	0.4	44.3	0.7	124.7	170.1
1976	2.7	31.0	40.5	223.9	298.1
1977	6.6	79.0	36.0	209.0	330.6
Total	9.7	154.3	77.2	557.6	798.8
Estimated, 1978	17.0	53.0	30.0	184.8	284.8
Other:					
1975	26.6	40.0	149.3	–	215.9
1976	20.2	426.0	274.5	–	720.7
1977	38.4	136.0	404.0	–	578.4
Total	85.2	602.0	827.8	–	1,515.0
Estimated, 1978	37.0	343.0	270.0	–	650.0
All sectors:					
1975	27.0	84.3	150.0	124.7	386.0
1976	22.9	457.0	315.0	223.9	1,018.8
1977	45.0	215.0	440.0	209.0	909.0
Total	94.9	756.3	905.0	557.6	2,313.8
Estimated, 1978	54.0	396.0	300.0	184.8	934.8
Proposed, 1979	87.0	413.0	250.0	206.7	956.7

[1] Based on estimates provided by AID/Cairo, November 1977, and revised as of February 1, 1978.
[2] Fiscal year 1976 includes transition quarter.
[3] Administered by U.S. Department of Agriculture. Includes Titles I and II.

Table 9.–Percentage Distribution of Funds Authorized for Economic Assistance to Egypt by Programs and Sectors, Cumulative, Fiscal 1975-77

[In percent]

Distribution	Technical assistance	Capital projects	Commodity imports	PL-480	Total
Programs:					
Agriculture	1	19	10	70	100
Other	6	40	54	–	100
Total	4	33	39	24	100
Sectors:					
Agriculture	10	21	9	100	34
Other	90	79	91	–	66
Total	100	100	100	100	100

Commodity Import Program (CIP)

This program provides the GOE with foreign exchange for the purchase of a wide range of raw materials, commodities, and equipment needed to rehabilitate or expand the industrial, agricultural, and service sectors. These expenditures also create additional employment by providing raw materials to increase output from existing plants. Total funds authorized under CIP totaled $905 million during fiscal 1975-77, of which about $366 million, or some 40 percent, have been allocated for agricultural raw materials, food, and equipment for food processing. Purchases are made from U.S. sources, with minor exceptions.

The loans for purchases are made to the Egyptian Government on 40-year terms, with an initial 10-year grace period with interest at 2 percent, and subsequently at 3 percent. The funding level reached $440 million in fiscal 1977, but is projected to decline to $300 million in fiscal 1978, and $250 million in fiscal 1979.

Allocations for tallow, corn, edible oils, and frozen poultry accounted for about 70 percent of all agriculture-related items. Although food purchases are not normally financed under CIP, an exception was made in fiscal 1977 because of the food emergency in January 1977 and the fact that funds available under P.L. 480 had been exhausted. Significant allocations also were made for the purchase of food processing equipment, tractors, and component parts.

The allocation of foreign exchange under each of the several large loans made to the Egyptian Government is determined chiefly by the Ministry of Economy and Economic Planning in response to requests made by other ministries and agencies that have foreign exchange allocations in their budgets.

Specific commodities to be purchased are determined by these ministries, rather than by AID, except for the general AID guideline that the funds be allocated approximately equally between capital goods and raw materials. The Ministry of Supply has an allocation of about $314 million, of which 94 percent will be spent on agriculture-related items, chiefly tallow, edible oils and corn. The Ministry of Industry acquires mostly industrial commodities and equipment, but is the primary agency for acquiring tractors, tobacco, and food-processing equipment. The Ministry of Agriculture was allocated only $18 million, chiefly for the purchase of soybean meal and tractors.

Table 10.—Commodity Import Program: Funds Allocated for Egyptian Purchases of Agricultural Commodities and Capital Items, Cumulative, 1975-77

[In millions of dollars]

Item	Amount
Agricultural commodities:	
Tallow	115.1
Edible oils	92.5
Corn	40.0
Tobacco	21.5
Frozen poultry	13.0
Soybean meal	11.0
Soybean seed, inoculants	2.0
Herbicides	1.7
Total	296.8
Capital items:	
Food processing equipment	38.6
Tractors and components	25.3
Grain unloaders	3.0
Water pumps	2.0
Total	68.9
Total, all items	365.7

Table 11.–Commodity Import Program: Total Allocations to Egypt by Ministries, and Agricultural Component, Cumulative, 1975-77

Ministry	Total allocation	Agricultural component	
	Million dollars	*Million dollars*	*Percent*
Supply	313.6	294.6	94
Industry	261.8	47.4	18
Agriculture	18.0	18.0	100
Irrigation	3.7	3.7	100
Trade	10.0	2.0	20
Total	607.1	365.7	60
All other Ministries and agencies	297.7	0	0

Nearly three-fifths of the total funds allocated under the CIP since its inception have been awarded to suppliers, but only one-fourth had been actually disbursed as of October 1, 1977. Delays in consummating actual purchases can be attributed to the lack of familiarity with U.S. sources of supply and procurement procedures. A training program has been initiated by AID to familiarize Egyptian procurement officials with U.S. procurement procedures. Such training should reduce the delays apparent in the operation of the CIP thus far. A central procurement office in the United States would help speed up purchases by the various Ministries that now operate independently.

The actual impact of CIP funds on the Egyptian economy is difficult to determine because of the time lags between authorization for purchase of industrial raw materials and equipment and their actual delivery and use in a manufacturing process. However, food items purchased under either CIP or P.L. 480 have moved rather quickly through the food system and are more visible to the public, but make no lasting contribution to economic development. Thus, a redirection of the CIP program may be needed to allocate a larger proportion to longer term development projects. Additional emphasis should be given to providing foreign exchange for the private sector, both directly for domestic firms and through additional capital for the Development Industrial Bank.

Capital Development Projects

This program provides, through grants and concessionary loans, foreign exchange needed to finance rehabilitation or expansion of production capacity and correct critical infrastructure deficiencies of the Egyptian economy. Selection of the projects to be financed thus far has been determined more by the ability of specific GOE agencies to implement projects than by any overall plan for balanced growth. However, most of the projects approved are consistent with the Egyptian Five-Year Plan for economic development.

Allocations under the program totaled $756 million for fiscal 1975-77, second only to the CIP. Actual expenditures in relation to the amount authorized are even less than for CIP because of the longer lead time required to develop specifications, identify and select appropriate machines and equipment, and consummate actual purchases. Further delays result from shortages of building materials, construction equipment, and skilled labor needed to fully implement these projects. Several of the approved projects–such as a cement plant, electric generating plant, and an improved communication system–are intended to alleviate such bottlenecks.

About $154 million, or 20 percent of total capital funds authorized in 1975-77, will be utilized for the agriculture and food sectors. These projects include construction of grain, edible-oil, and tallow storage and handling facilities at two ports and purchase of large-capacity irrigation pumps; dredging equipment to rehabilitate major irrigation canals, and the equipment and raw materials needed to manufacture plastic drainage pipe.

Internal problems of the Egyptian Government have hampered coordination of efforts among ministries and the development of well-conceived projects. Inability to provide the prescribed amounts of local currency specified for projects also has delayed project implementation. Although widely recognized within the GOE, these problems are likely to persist until specific steps are taken to solve them. A more thorough appraisal of U.S. funds allocated for capital projects may be warranted until the backlog of projects can be reduced and there is greater assurance that new projects will be completed more expeditiously than in the past.

Table 12.–Commodity Import Program: Fund Authorized, Committed, and Disbursed to Egypt, Fiscal 1975-77 and Estimated 1978

Fiscal year	Authorized	Committed	Disbursed
	Million dollars	*Percent*	*Percent*
1975	150	100	74
1976[1]	315	100	17
1977	440	86	11
Total	905	93	24
Estimated 1978	300	–	–

[1] Includes transition quarter.

Assuming that current problems can be mitigated, some initial planning is needed to identify priorities for additional capital projects in the agriculture sector. Present indications are that substantial new investment is needed in the food marketing and distribution system, including grading and storage facilities, central wholesale markets, transportation, and retail distribution. Deficiencies exist also in the production and distribution of several key farm inputs. Although such expenditures often are less visible and have a longer payout period than efforts to increase agricultural output, they are likely to become more critical in the future as the trend toward urbanization continues, and as increasing quantities of food products must be moved from rural areas. In any event, efforts to increase farm output require parallel efforts to convert raw food products to the form and place where they are needed by an increasingly urban population.

P.L. 480, Title III

In the 95th Session of Congress, Section 211 (a) Title III of the Agricultural Trade Development and Assistance Act (P.L. 480) was amended to provide an additional source of funding for rural development projects in countries receiving P.L. 480 commodities. In essence, the Amendment forgives the repayment of a certain percentage of the debt incurred by imports of U.S. food commodities so long as that percentage of local resources is committed by the host government to approve projects. The poorest segment of the rural population is to be favored. Such broad categories as increased agricultural production; storage, transportation, and distribution of commodities; and family planning and nutrition programs are specifically mentioned as being eligible for support.

The Food for Development Program, or simply Title III, may add a new dimension to rural development programming in Egypt. Rough estimates indicate that as much as $25-million equivalent per year might become available for financing self-help projects in rural villages. If the various problems connected with identifying viable projects and staffing them satisfactorily can be overcome, Title III could become a highly visible addition to the AID program in Egypt, and one that might reap substantial benefits at relatively low cost.

The AID mission in Cairo submitted preliminary recommendations in October 1977 for possible Title III projects as follows: "cooperative facilities including storage, livestock care centers, village potable water systems, small irrigation projects, canal maintenance, village roads, village sanitation projects, and health care centers." Funding for several of these projects was approved in late 1978. Notably absent were the noneconomic or prestige projects that have sometimes marred rural community development in other countries.

Administration of small rural projects generally is very difficult, in large part because it usually entails reconciliation of the interests of more than one government entity. For example, an otherwise simple program of providing safe water in the villages may engage such diverse ministries as construction, local government, health, finance and others, each with its own procedural practices.

In Egypt, there is a possible way out of this bureaucratic tangle, namely by working with the chief administrative officers in any or all of the 27 governorates. The governors in the GOE hierarchy enjoy a rather high degree of autonomy and conceivably could serve effectively in coordinating roles.

Title III obviously would have little impact on the balance-of-payments problem, but it could become a useful and popular addition to the total U.S. assistance effort. Moreover, it is implicit in the law that labor-intensive projects will have precedence over capital-intensive undertakings. This feature should have remedial value with respect to any labor displacement occasioned by farm mechanization. Finally, the program is inherently noninflationary.

Agricultural Projects

Of the 22 AID-supported agricultural and agricultural-related projects under implementation or planned for Egypt, 2 may be identified as efforts to strengthen the infrastructure, 8 have a technical orientation, 10 are primarily capital projects, and 2 are directed at human resources. Most of these are set up for 4-5 years, although presumptively any project may be extended or terminated, depending on performance.

Because of overlaps among the sectors, it is not possible to establish a clear agricultural-nonagricultural classification. A rough approximation, however, suggests that about $143 million, or 19 percent, of the $750 million security assistance budget for fiscal 1979 is earmarked at least primarily for projects related to the agriculture and food sectors. About 80 percent of this amount will go for tractors, structures, spare parts, and capital projects. Direct capital inputs far exceed allocations for technical assistance.

Except for poultry production, U.S. aid presently provides no support for livestock. Certain crops—such as cotton, citrus and tobacco—receive no assistance because of real or presumed competition with U.S. farm products. Provisions for bolstering indigenous analytical and planning capabilities are in their infancy. No AID commitments yet have been made in the new lands, and agribusiness developments are stalled.

Table 13 is a listing of AID projects in Egypt that are either specifically agricultural in character or agriculture-related. Because of the newness of AID activity in the country and the lead time for project approval, only 7 of these 22 projects actually are being implemented, although another 6 are in the advanced planning stages. In the aggregate, this compilation reflects the broad composition of AID's current agricultural "package" and probable directions for the future. Classifications of projects are arbitrary and intended only to indicate program intent:

A. To strengthen infrastructure

0016 Applied science and technology.—This project is designed to improve the planning capabilities of the GOE Academy of Science and Technology and will concentrate on the following management and planning factors:

- Policy planning and management
- Research and development, subproject support
- Demonstration, subproject support
- Planning of Phase II of the project

A grant agreement was signed in March 1977. Working with the GOE is the U.S. National Science Foundation. Funding levels for the project will approximate $20 million during its 4-year life.

0041 Agricultural development systems.—This project is designed to strengthen the capability of Egyptian institutions to plan and carry out agricultural sector development. The Ministry of Agriculture is the lead agency. A grant agreement was signed in September 1977, to be followed by a contract with the University of California to "develop a collaborative relationship" with the Ministry. Horticulture, vegetables, and agricultural economics will be the first subjects to be studied. The first contract will cover a 5-year period at an estimated cost of $11 million.

B. To increase agricultural production

0017 Water use and management.—Precipitated in part by the radical changes in the flow and quality of water from the Nile when the Aswan Dam was completed, this project aims at analyzing soil, water, crop, farmer and on-farm interaction, with the ultimate goal of extending improved water management practices throughout the Egyptian irrigation system.

A contract for this purpose was signed with Colorado State University for the Consortium for International Development in May 1977. Its cost for 6 years will be approximately $7 million.

0027 Rice research and management.—This project concentrates on rice research and training of Egyptian technicians and will encompass modernization of the full range of practices currently involved in rice production: Seed improvement, seeding rates and timing, water management, fertilization, mechanization, disease control, milling, marketing, handling, storage, and extension services.

An AID project agreement has been signed and implementation is expected to begin in the near future. The National Research Center will be the principal collaborative agency for the GOE. Total project costs are estimated at $17.8 million, with the U.S. supplying a grant of $8.2 million plus $2.2 million equivalent in local currency, and the host country £E5.2 million ($7.4 million). The project is scheduled to last 5 years.

0060 Poultry improvement.—This project is to contribute to the Egyptian goal of raising broiler production from 175 million to 600 million birds annually, with corresponding increases in production of eggs, chicks, and feed supplies. A grant agreement was signed in August 1977, and a contractor has been selected to implement the project. One of the complications has been how best to promote village flocks as well as large-scale production units utilizing modern vertical integration techniques.

The 3-year project is expected to cost $4.6 million plus £E1.2 million in local currency. Three-fourths of the latter would be provided by GOE.

0064 Aquaculture.—From an original broad survey that examined both inland and high seas fisheries, it

Table 13.—Classification of Agriculture and Food Sector AID Projects in Egypt, According to Primary Purpose[1]

[In thousands of dollars]

Project number and title	Fiscal year budgets			
		Proposed		Projected life of project
	1977[2]	1978	1979	
I. Strengthen infrastructure (planning, data base, organization, etc.):				
0016 Applied science and technology	3,900	4,200	4,000	20,000
0041 Agricultural development systems	1,200	3,800	2,000	11,000
II. Increase agricultural production, strengthen food delivery system:				
A. Technical orientation:				
0017 Water use and management, on-farm	2,300	1,500	1,500	7,000
0027 Rice research and management	2,367	1,500	1,800	8,200
0060 Poultry improvement	471	3,500	600	4,571
0064 Aquaculture	–	700	2,500	12,000
0070 Major cereals (wheat, maize)	–	1,500	1,500	8,500
0079 Small farmers – access to farm inputs	–	–	7,000	12,500
0095 Agricultural cooperative development	–	–	1,000	4,000
0096 Small-scale agricultural activities	–	–	500	500
B. Capital orientation:				
0019 PVC drainage pipe (equipment and materials)	31,000	–	–	31,000
0028 Grain, tallow, oils and fats storage, handling facilities	44,275	–	–	44,275
0031 Agricultural mechanization	–	–	21,000	44,000
0035 Dredging equipment (canal improvements)	26,000	–	–	26,000
0037 Grain, tallow, oils and fats storage, handling facilities	42,000	–	–	42,000
0040 Irrigation pumps	11,000	–	–	11,000
0049 Grain, tallow, oils and fats storage, handling facilities	–	25,000	–	25,000
0056 Agribusiness development (chiefly loans)	–	–	25,000	25,000
0074 Provincial electrification	–	–	50,000	50,000
0077 Grain, tallow, oils and fats storage, handling facilities	–	–	20,000	20,000
II. Human resources, rural orientation:				
0015 Rural health services	1,800	1,800	1,800	7,800
0021 Development decentralization #1 (rural village industries, ORDEV)	–	1,500	2,500	7,500
V. Technical and feasibility studies				
Funds allocated to these projects can be used for both agricultural and nonagricultural projects and cannot be allocated by sectors	22,500	15,000	10,000	–

[1] Based on Annual Budget Submission, fiscal 1979, June 1977, and revisions as of January 1978.
[2] Cumulative through fiscal 1977.

was determined that this project should address pond fish production, chiefly near the brackish lakes in the northern Delta. Its purpose would be to supplement the limited protein content of the Egyptian diet. Funds are to be provided for facilities, commodities, technical assistance, and training. A project agreement has been signed, and a contractor is being sought to carry it out. The project entails a grant of about $12 million over a 3-year period.

0070 Major cereals (wheat, maize).—Still on the drawing board, this project has the technical support of the International Wheat and Maize Improvement Center (CIMMYT) and would cover research, training, and demonstration work on these two important cereal crops. The Egyptian organization through which the work would be done is the National Maize and Wheat Research and Production Program.

0079 Small farmers' production.—The objective of this project is to increase the availability to farmers of essential inputs such as fertilizer, seeds, animal feeds, veterinary medicines, and appropriate farm equipment. Means for creating a viable credit mechanism to finance these inputs is included in the project. Results from other projects such as those pertaining to major cereals, rice production, water use, and management will provide a basis for determining the amounts and timing of the various inputs needed.

Details of the project to be developed in fiscal 1979 will include management and credit training and loan fund capitalization for village banks. Funding of $7 million has been requested for fiscal 1979, and the total cost through fiscal 1984 is estimated at $12.5 million.

0095 Agricultural cooperative development.—The purpose of this project is to establish private-sector agricultural cooperatives and encourage their application of improved technologies.

This project would begin on a pilot basis, probably in the cooperative marketing of fruits and vegetables. The initial effort would emphasize planning, management, and training in a cooperative development center. For its first 4 years, costs are estimated at $4 million.

0096 Small-scale agricultural activities.—This project aims to encourage small and intermediate technologies through pilot activities at the local level. It would provide small grants in support of low-cost technology for cooperatives and other private sector groups.

Funding would be modest, $500,000, and extend only over a year or two.

C. Capital orientation

0019 PVC pipe drainage II (equipment and materials).—Following completion of the high dam at Aswan in 1970, waterlogging and salinity conditions were aggravated in the Nile Delta, and large areas of land were threatened with being forced out of production. This drainage project, a cooperative effort of AID, the World Bank, and IDA, is aimed at relieving those conditions. Its work includes construction of new pumping stations, remodeling of open drains on 810,000 feddans, and manufacture and installation of field drains and collectors on 400,000 feddans. In addition, it would extend the *bilharzia* control program in Upper Egypt.

The principal AID contribution to the project is that of supplying polyvinylchloride (PVC) pipe for field drains.

As part of a comprehensive drainage program, the "Drainage II Project" entails a $25-million AID loan at concessional rates, which matches much larger contributions by GOE and IBRD/IDA. No termination date was specified in the Project Identification Document.

0028, 0037, 0049, 0077 Grain, tallow, oils and fats storage.—The purpose of these four projects is to construct modern storage facilities for grain, tallow, and fats in order to eliminate high losses due to spoilage, waste and infestation. The initial loan provided $44 million for building two 100,000-ton grain handling and storage facilities at Alexandria and Cairo. Actual construction of the facilities has been delayed by engineering problems and shortages of cement.

The enormous increase in the import of grain, tallow, and fats in the last 4 years has taxed Egypt's storage and handling capabilities to an intolerable degree. Subsequent projects, which are presently undergoing a long-range feasibility study, will add an additional $75 million to the first loan for grain storage alone.

0031 Agricultural mechanization.—This project is a two-part effort: Farm Mechanization Support (FMS), and small-scale mechanization research and development to be undertaken by the Mechanization Institute. Each of these sections, in turn, has provisions for equipment, consultant services, and participant training. The purpose is to rationalize and augment the move already underway toward farm mechanization.

The estimated total outlay is $44 million, of which $21 million is requested for fiscal 1979. Part of this amount ($10 million) would be spent to purchase U.S. farm equipment and an additional amount to provide farmer credit to purchase locally produced farm items.

0035 and 0040 Dredging equipment (canal improvements) and Irrigation pumps.—This two-part project is composed almost entirely of commodity procurement for the rehabilitation and maintenance of the irrigation system in the Delta and Middle Egypt, but also contains limited provision for engineering and management consulting services to train

Egyptian operating staffs. Equipment furnished includes drag-lines, backhoes, scrapers, hydraulic dredges, shop and field repair and maintenance equipment, tractor-units, pumps, and electrical parts for pumping stations. Small quantities of seed and herbicides also will be purchased.

A component of a nationwide irrigation program, the project supplements existing equipment and replaces worn out and obsolete units. The loan totals $37 million, and no completion date has been set.

0056 Agribusiness development.—A grant of $25 million is proposed for fiscal 1979 to provide financing for the GOE to support U.S.-Egyptian private-sector joint ventures in new agribusiness. Grant funds would be used to finance the purchase of U.S.-source equipment and other materials, and private equity capital would be obtained from Egyptian, Arab, U.S., or other foreign sources.

Similar funding was planned in previous years, but no projects were approved. However, the GOE continues to stress the need to develop new lands, and the Agribusiness Council has identified several projects that it believes offer good potentials for foreign investors.

0074 Provincial electrification.—The Egyptian Rural Electrification Authority (EREA) plans to provide electric power to 38 towns, 2,000 villages, and 25,000 hamlets during the next 5 years. Under this proposed 1979 project, AID would finance the foreign exchange costs of certain imported equipment and American engineering consulting services to assist the work of the EREA in bringing electric service to farmers, small businesses and industries, and other residents of smaller towns and villages.

The project is scheduled for completion in 5 years, with the U.S. contribution amounting to $50 million. Other donors include the World Bank and Canada.

D. Human resources, rural orientation

0015 Rural health services.—This project, initiated in fiscal 1976, is designed to assist the Ministry of Health in improving the effectiveness of rural health services, including transportation, communication, management, and training of personnel. A U.S. contractor has been selected, and full-scale activities began in early 1978.

Several other donors also are involved in the rural health area, including United Nations International Children's Emergency Fund, the World Health Organization, and West Germany. The USAID contribution will amount to $7.8 million over a 5-year period.

0021 Development decentralization.—As part of the policy of encouraging local initiative in both government and private affairs, this project would strengthen the capacity of village councils to plan and execute economic and social development projects in the local community. The funds would augment local budgets and support a training academy for staff development.

The project is to extend for 5 years with the AID input booked for $7.5 million.

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