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Food and Agricultural Policies in Egypt

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Abstract. In mid-1990, Egypt's population was estimated to be 55.6 million. Urban population is 44% of total population. A high proportion of Egypt's population is below 15 years of age.

The standard of living in Egypt as measured by quantifiable social and economic indicators has improved markedly in the last two decades. Food intake, education, and health standards are higher today than ever. Food availability in Egypt far exceeds the average availability for developing countries.

In the early 1970s, agriculture contributed about 28% to GDP but employed about 53% of the work force. By the end of the 1980s, agriculture's contribution to GDP declined to only 17% and its share of total employment dropped by nearly one third. Agricultural growth was low (only 2.7% from 1965-1980) and declined to 2.5% during 1980-1990. Agriculture's share of all goods exported declined from 75 in 1970 to 15% in 1989. Self-sufficiency ratios for most food commodities declined during the 1970s and 1980s.

Major shifts took place in the cropping pattern from 1970 to 1990. Area devoted to cotton declined from 1.6 million feddans in 1970 to less than 1 million feddans in 1990. At the same time, maize, fruits and vegetables areas increased. Egypt achieved a very high GDP growth rate of eight to 9% in real terms during the second half of the 1970s. Oil exports, remittances, Suez Canal earnings, and tourism financed this growth. In the early 1980s, foreign exchange earnings dropped, and as a result, economic growth fell sharply. Since 1986, real GDP growth has been less than 3% a year, investment has dropped sharply, per capita national income and consumption declined in real terms, and external indebtedness grew to about 154% of GDP in 1989.

The Egyptian economy's rapid deterioration during the latter half of the 1980s was not due only to declining foreign exchange earnings, however. Inflated public spending in the 1970s and early 1980s created large budget deficits, intensified inflationary pressures, and undermined the balance of payments. Moreover, the use of foreign loans to finance the current account deficit increased external debts. Finally, the pervasive systems of price control, distorted allocation of resources, overvalued exchange rate, and the lack of proper incentives prevented the development of a large diversified export sector and contributed to economic stagnation and decline in Egypt in the 1980s.

Government investment in agriculture and irrigation has been very modest during the last two decades. The share of agriculture and irrigation in total public investment fell from about 23% in the mid-1960s to about 8% in the mid-1970s, then increased to 9% in recent years. Therefore, compared to other sectors, agriculture has shown the slowest growth with an average increase of about 2.7% per year and 2.5% per year, between 1965 and 1980, and 1980 and 1990, respectively.

Budgetary outlays for food subsidies constituted about 5% of total government expenditure in 1989/90. Wheat and flour subsidies were the most important among food subsidies during the 1960s and most of the 1980s. However, 1989/90 data show sugar with the largest share of food subsidies. In an attempt to reduce the cost of the ration/food subsidy program in Egypt the government adopted several major measures; raising ration/subsidy prices, reducing the number of items included, and reducing the quantities subsidized.

The four most important agricultural subsidies were on fertilizer, credit, cotton pest control, and yellow corn. Other input subsidies included sugarcane irrigation, extension services, and pest control for crops other than cotton. Both the manufacture of domestically produced fertilizer and distribution of domestic and imported fertilizer were subsidized. Fertilizer subsidies were paid by the General Authority for Agricultural Stabilization Fund (GAASF). Pesticides were the next most important input with respect to subsidies. Yellow corn subsidies fell drastically after 1985, and it is even estimated that the Egyptian government made a profit from imported yellow corn in 1988/89.

The simplest measure of price distortion is the Nominal Protection Coefficient (NPC). For the purpose of this study, two sets of NPCs were computed. First, gross NPCs were computed using the official exchange rate for five major crops (cotton, rice, wheat, maize, and sugarcane). Second, indirect interventions brought about by exchange rate policies were measured by adjusted NPC which took into account biased official exchange rates. The results show that all major crops were taxed from 1970-1990. Moreover, a comparison of the gross with net NPCs indicated that indirect price discrimination owing to distorted exchange rate policies exacerbates taxation caused by direct pricing policies.

In mid-1991, the government adopted a wide-ranging program of economic reform, which resulted in some positive effects on foreign exchange and budget deficit.

Substantial progress has been made on the reform of agricultural policies. Only cotton and sugarcane remain under some government controls and total decontrolling of these two crops is expected in the following two years. All input subsidies have been reduced and will be eliminated by 1993. Control of private sector farm product processing and marketing firms has been removed.

Introduction

Agriculture remains one of the largest sectors of the Egyptian economy, accounting for about 17% of gross domestic product (GDP), 37% of total employment, and significant foreign exchange earnings (World Bank, 1992).

In Egypt, the agricultural sector has been affected by many forms of government interventions, among them sector-specific policies or direct forms of intervention that include planning of the cropping pattern and rotations; procurement quotas for certain crops; fixed prices for quota and non-quota products and regulations on wholesale and retail prices; subsidization of some agricultural inputs; and an extensive consumer subsidy and rationing system for basic food items. In addition, economy-wide or macroeconomic and trade policies pursued by the government have indirectly affected agricultural performance. The impact of this mixed heritage of interventions is detrimental to agriculture in most developing countries, and Egypt is no exception.

Sector-specific and economy-wide policies followed by the Egyptian government over the last two decades have resulted in significant negative effects on Egyptian agricultural production and exports. Policy discrimination led to imposing a substantial burden on the agricultural sector. Moreover, these government policies have contributed to the flow of resources out of agriculture.

Some experts argue that the taxation of agriculture with price and subsidy instruments has created black markets for inputs diverting subsidized inputs to profitable crops and created policy-generated rents for a few farmers, as in the case with fertilizer. Protecting certain sectors and taxing others creates inefficiencies in the allocation of scarce resources. Furthermore, exchange rate and trade policies of the Egyptian government that encouraged imports and led to a relative decline in agricultural exports contributed to significant decline in the country's self sufficiency ratios in food. The agricultural trade balance that showed a surplus of $300 million in 1970 recorded a deficit of $2.6 billion in 1983/84 (Dethier, 1987).

In addition to all the facts discussed above, in the early 1980s Egypt experienced a significant decline in its major sources of foreign exchange (i.e., oil revenue, Suez Canal earnings, and remittances of Egyptians working in the Gulf States). The current account deficit grew to a peak of US$ 2.1 billion in 1985, about 4.7% of GDP. External debt increased rapidly, reaching US$ 49 billion or about 154% of GDP by 1989. The budget deficit remained above 20% of GDP, and inflation at 20% for most of the 1980s. It has become clear that a radical reform of food and agricultural policy is required. Reforms are required at two levels: the sectoral level and the macroeconomic level.

Since 1986, the government has undertaken a series of economic reforms to reduce external and internal imbalances, to eliminate distortions in the economy, and to promote sustainable growth in the productive sectors. Furthermore, the policy-makers have taken steps to reduce restrictions in the agricultural sector. Price and marketing controls over farm crops have been reduced or eliminated. In addition, some of the subsidies for farm inputs (fertilizer, animal feed, credit, pest control) were reduced.

The objectives of this study are to provide a detailed description of the agricultural sector, to measure the degree of intervention affecting agriculture, and to examine whether and the extent to which general macroeconomic developments and polices have had significant incentive or disincentive implications for the agricultural sector.

I – An Overview of the Economy

1. Location and Size

Egypt occupies the northeastern corner of the African continent, with an extension across the Gulf of Suez into the Sinai region. The country has a roughly square shape with the Mediterranean Sea forming the northern boundary.

Although the total area of Egypt is 1,002,000 square kilometers, less than 3.5% of this land is under cultivation. The Egyptian coasts have a total length of about 2,936 kilometers, of which 995 are on the Mediterranean, and 1,941 are on the Red Sea.

2. Geography and Soils

Egypt is divided into three broad geographical areas: the Nile Valley and Delta, the Eastern Desert and Sinai, and the Western Desert. The soils of the Nile Valley and Delta owe their origin to the Nile River. Before construction of the Aswan High Dam, the Nile carried millions of tons of suspended matter annually, and a fraction of it was deposited on the basin lands in the Nile Valley and Delta. These alluvial soils are for the most part level, deep, dark, brown and heavy to medium in texture. The Nile Valley in both Upper and Middle Egypt is surrounded on both sides by a series of gravel and sand terraces of different ages.

3. Climate

Egypt extends south from the 32nd parallel to below the Tropic of Cancer. It has a warm arid climate with a relatively cool winter from November to April and a hot summer from May to October.

Winter temperatures in Cairo range between 8.8° Celsius (°C.) and 18.2°C.; the summer temperatures between 20.5°C. and 33.3°C. In Upper Egypt, the winters are mild; maximum temperature ranges from 19°C. to 23°C. and minimum temperatures are around 4.7°C. to 9°C. Summers are hot in the daytime and warm at night, with maximum temperatures from 34°C. to 40.8°C., and minimums from 19°C. to 25°C.

Rainfall is almost entirely limited to the northern coastal region and a few kilometers inland, where the average annual rainfall ranges from 65-190 mm. The Nile Delta and adjacent areas receive 25-65 mm of rainfall annually. Areas south of Cairo, in Middle and Upper Egypt, average about 25 mm annual rainfall. With very little cloud cover, sunshine falls on the ground surface well over 90% of the possible time.

4. Population

Egypt has a long history of population records. Modern censuses began in 1800, when Egypt's population was found to be 2.5 million. Regular census-taking began in 1882, when the population calculated to be 6.7 million. Registration of birth and deaths began in 1898, and became compulsory in 1912.

Egypt's population almost doubled from 9.7 million to over 18 million persons in the 50 years from 1897 to 1947. The next doubling took less than 30 years, from 1947 to 1976, while the most recent population census in 1986 indicated that Egyptian population was 50.5 million (including Egyptians abroad). In mid-1990 the country's population was estimated to be 55.6 million *(Table 1-1)*.

The population growth rate, which was 1.5% per year at the beginning of this century, increased from the early 1950s, reaching a rate of about 2.5% in the early 1960s. Between the two censuses of 1976 and 1986, the population growth rate was as high as 2.8%.

The crude death rate declined from around 19 per 1,000 in the early 1950s to less than 10 per 1,000 in the late 1980s. The reported crude birth rate declined from over 40 per 1,000 in the mid-1960s to 34.5 per 1,000 in 1972. The period after the 1973 war witnessed the Egyptian version of a "baby boom" as the birth rate rose to 40 per 1000 in 1979. By the end of the 1980s, however, this rate was only 32 per 1,000.

Over 97% of Egypt's population is crowded in about 4% of the total area of one million square kilometers. The remaining 96% is uninhabited. This high population concentration in the Nile Valley and Delta, gave Egypt, in 1986, a density rate of 48 persons per square kilometer for the total area; however, for inhabitable land the density rate was over 1,170 persons per square kilometer.

Between 1960 and 1986, the urban population increased from 38 to 44% of the total population as the limited agricultural area failed to support the mounting rural population. The Greater Cairo population in 1986 was estimated at over 9.8 million compared with 7.5 million in 1976 (CAPMAS, 1991).

As in many developing countries, a high proportion of Egypt's population is below 15 years of age (the 1986 census showed 40% of the population was below this age). This shows that Egypt suffers from the economic handicap of having a large number of children dependent on the adult population, represented by the 15–64-years-old.

5. Water Resources

Water availability is an important factor in agricultural, urban and industrial development, and the decisive factor for future expansions. In Egypt, the agricultural sector is unique, with its almost total reliance on irrigation from the Nile. Primary water sources are the Nile, rainwater, and underground water in the desert and Sinai. In 1990, these sources supplied about 56.93 billion cubic meters distributed as follows: the Nile, 55.5 billion cubic meters; North coast and Sinai rainwater, 0.43 billion cubic meters; and Western Desert and Sinai underground water, 1 billion cubic meters. Secondary water sources provided 4.35 billion cubic meters from the reuse of agricultural drainage water and subterranean water in the Delta and the Nile Valley, and treated waste water.

Total use of water for various activities in 1990 was 61.3 billion cubic meters, distributed as follows: 51.8 billion cubic meters for farming; 4 billion cubic meters for drinking; 3.7 billion cubic meters for industrial uses; and 1.8 billion cubic meters for other uses (Rady, 1992).

The 1959 agreement between Egypt and the Sudan determined Egypt's share of the Nile's water to be 55.5 billion cubic meters a year. However, from 1979 to 1987, Egypt faced a serious water shortage. Drought in the Ethiopian highlands reduced the annual flow into the High Dam Lake. As a result in 1987, Egypt received only 42 billion cubic meters of water (Parker, 1988).

Some experts argue that this water crisis is a cycle in the long life of the river and cite four similar shortage periods (1911-1915, 1918-1922, 1939-1945, and 1968-1973) to support their argument. Annual water discharge was below average during these periods, but recovered afterwards (Rady, 1987).

A different theory is presented by Waterbury (1979), who argues that this reduction in the water discharge of the Nile is part of a negative long-term trend. However, reviewing the average annual discharge of the Nile for the period 1901-1987 does not indicate a significant trend toward reduced discharge (El Miniawy, 1989).

6. Selected Measures of Living Conditions

The standard of living in Egypt as measured by quantifiable social and economic indicators has improved markedly in the last two decades. Food intake, education and health standards are higher today than ever.

Food availability in Egypt far exceeds the average for developing countries as a whole. From 1970 onward, the food availability per capita has increased steadily in Egypt with caloric availability reaching 3,336 calories per capita in 1989 (World Bank, 1992).

While these per capita levels of food intake seem high for the population as a whole, the data might be misleading since there are significant portions of the population with inadequate energy intakes. Approximately 35% of the population consumes less than 2,000 calories per capita. The problem of inadequate consumption is worse in rural compared to urban areas of the country (World Bank, 1990).

Data in *Table 1-2* show that the general health of the Egyptian population has steadily improved during the last two decades. Life expectancy at birth increased from about 51 years in 1970 to about 60 years in 1990.

Moreover, great improvement in child survival has been achieved; infant mortality (first year of life) decreased from 158 per 1,000 in 1970 to 66 per 1,000 in 1990. However, one should be aware of the fact that considerable inequalities exist in infant and child mortality by region. The infant mortality rate per thousand in urban areas is only 44 per 1,000, compared to 91 in Upper Egypt (World Bank, 1990).

In rural areas, the number of public health service units increased from 2,186 in 1975 to 2,684 in 1990, or by about 23%, showing the Egyptian government's great concern for this important and critical service (CAPMAS, 1991). Furthermore, the number of persons served by one physician declined from 2,300 in 1965 to 770 in 1984. This ratio is clearly better than all low-income and some middle-income countries (World Bank, 1992).

The 1986 census offers information on the type of water sources available in dwellings in both urban and rural areas. In urban areas, the vast majority of households (92.4%) has access to piped public water systems. In rural areas, however, only a little over half the total number of dwellings (55.9%) are connected to public water systems. In Upper Egypt, only 42% are connected (CAPMAS, 1988).

During the last 20 years, increasing resources have been devoted to building up the education network and enrollments have grown rapidly at all levels. Between 1970 and 1989, the primary school enrollment ratio (at age six) grew from 72 to 97%, while for the secondary school, the enrollment ratio increased from 35 to 81% *(Table 1-2)*. Despite this progress, education expansion has not kept pace with population growth. Consequently, illiteracy remains high. In 1986, 17.3 million persons—representing about half of the population age 10 or older—were classified by the census as not able to read and write, compared to only 15.1 million in 1976.

Supplying rural areas with electricity was given high priority during the 1970s and 1980s. By 1989, the number of villages with electricity was 4,318 out of a total of 4,358. However, some smaller communities have not benefited from this rapid expansion in rural area electrification. It is argued that providing rural areas with electricity has been a major cause of social, cultural, and economic change that has taken place in Egyptian villages.

7. Macroeconomic Characteristics

The Egyptian economy is best described as government-dominated, with a dominant public sector, centralized planning, and a vast network of government intervention in production. Investment, distribution and foreign and domestic trade. During the 1980s, some progress was made towards economic reform. But the reforms were too small to affect the fundamental nature of the economy.

Rising oil production and prices, increased remittances, and expanding foreign aid paved the way for great improvements in economic performance during the latter half of the 1970s, when real GDP rose by an average of over 9% a year (World Bank, 1990). After 1986, the economy took a downturn because of the fall in oil prices, which was the major export commodity. Other major sources of foreign exchange—remittances and tourism receipts—also dropped. From 1986 to 1989, real gross domestic product (GDP) growth was less than 3% a year, investment dropped and inflation ran at 25% a year, *(Table 1-3)* per capita consumption declined in real terms, and the unemployment rate was estimated at 20% of the labor force (Tobar, 1992).

There is a clear shift from an agricultural economy to a more diversified one. The shift is indicated by both the declining share of agriculture *(Table 1-4)* and the differential growth rates displayed in *Table 1-5*. The fastest growing sector throughout the last three decades was services; industry came second, while agriculture was a distant third.

The public sector has been an important feature of Egypt's economic development. Public consumption was about 19% of GDP in 1965 at the end of the first five-year economic development plan implemented in Egypt. While private consumption declined from about 67% in 1965 to 59% in 1975, public consumption increased to about 26% of GDP over the same period.

Investment increased dramatically from 18% in 1965 to 33% in 1975. Exports grew from 18% of GDP in 1965 to 20% in 1975. By the end of the 1980s, private consumption grew significantly to 80% of GDP, while both public consumption and investment declined to only 10%, and 23% of GDP, respectively. Exports remained a fixed proportion of GDP *(Table 1-6)*.

Egypt's external deficit has persisted since the Second World War (World Bank, 1986). In recent years, this account has fluctuated and seems to be deteriorating *(Table 1-6)*. Egypt's national debt in 1989 was US$ 49 billion.

II – Agricultural Sector Macro-Decomposition

For centuries, agriculture has occupied a pivotal position in the operation of the Egyptian economy. In recent years, Egypt's most important economic concerns are reducing dependence on food imports and management of the foreign debt.

This chapter presents a detailed picture of the Egyptian agricultural sector's major components and features. The first subject to be explored is agriculture's role in the national economy. Second, a discussion of the available resource base and productivity is presented. Finally, infrastructure, including the transportation network, research and extension facilities, irrigation and drainage structures, and marketing and credit institutions is discussed.

1. Agriculture's Role in the Egyptian National Economy

In the early 1970s, agriculture contributed about 28% of total GDP, but employed about 53% of the work force. By the end of the 1980s, agriculture's contribution to GDP declined to 17% and its share of total employment dropped by nearly one third *(Table 2-1)*.

At constant prices, agricultural growth averaged 2.7% from 1965-1980 and 2.5% from 1980-1990 (World Bank, 1992). This rate of growth is low compared to the growth rates for the services sector (13.7%), industry (6.9%), and the economy as a whole (7.3%), during that period. In fact, a low growth rate is unsurprising in view of the small share of fixed investment allocated to agriculture at the time.

Throughout history, agriculture has been Egypt's major source of foreign exchange. However, as other sources developed (especially oil), agriculture's share of goods exported declined from 75% in 1970 to 15% in 1989. At the same time, demand for agricultural products (food in particular) grew far faster than production. To satisfy this demand, imports of agricultural goods surged. Consequently, the agricultural trade balance, which showed a surplus until 1973, indicated a deficit of 62 million dollars in 1974, and continued to be in deficit ever since. The deficit recorded a high of US$ 2,594 million in 1983 *(Table 2-2)*.

Stagnant agricultural production and increasing food imports implied a serious deterioration in the country's ability to feed itself. Self-sufficiency ratios for most food commodities declined during the 1970s and 1980s. In the mid-1980s, imports accounted for more than 80% of the wheat, and almost 50% of the sugar consumed in Egypt. However, an increase in the self-sufficiency ratios for these products can be observed in the late 1980s *(Table 2-3)*.

Table 2-4 shows the relative importance of different subsectors in Egyptian agriculture. Data in this table indicate that plant production dominates Egypt's agricultural sector, contributing more than 9,073.7 L.E. million a year on average or about 63% of agricultural production from 1984 to 1988. Field crops such as cotton, wheat, rice, maize, and sugarcane represent more than 61% of the plant production subsector, followed by vegetables at 20.5%, and fruits and flowers at 16.7%.

The relatively large share of livestock production may be explained by the fact that government policy continued for a long time to favor domestic producers; the nominal protection coefficient for frozen meat is well above one, in addition to substantial non-tariff barriers to meat imports (Richards, 1991).

2. Land Distribution

The total area of Egypt is about 245 million feddans (1 feddan = 1.038 acres). Total agricultural land does not exceed 7.4 million feddans or 3% of the total area of Egypt. Available data indicates that agricultural land per capita decreased from 0.4 feddans in 1927 to about 0.21 feddans in 1960, then to only 0.133 feddans per capita in 1990 (NPI, 1989).

In discussing land distribution, one can use more than one criterion. This section presents a brief discussion of land distribution in Egypt according to holding size, major crops grown on this land, irrigation water source, irrigation methods used, and new and old land designations.

3. Distribution of Land Holding by Size

Because of its limited arable area, Egypt has always been a country of small land holders. *Table 2-5* presents data on land holdings by size for 1961 and 1981/1982. Land holding is an indication of land actually cultivated by the farmer; owned land plus land rented in, minus land rented out. *Table 2-5* shows that the total number of holdings increased by about 50% while the cultivated area increased by only 6.6%, with the result that average holding fell from 3.9 feddans in 1961 to 2.7 feddans in 1981/82.

While the absolute number of very small holdings (below three feddans) almost doubled and increased its proportion of the total number of holdings from 1961 to 1981/82, the proportion of all other sizes fell. This trend in the direction of more fragmentation of land is a result of the land reform measures enacted by the Egyptian government, as well as the cumulative effects of inheritance laws.

As a result of the 1952 Land Reform Act No. 178 and subsequent laws and regulations, land holdings were broken up and land redistributed among landless villagers. Originally, no one family was allowed to hold more than 200 feddans, but this was subsequently altered to 200 feddans per person in the private sector, and by 1961 this limit was reduced to only 100 feddans.

Legal tenure of rented land was also given by the Land Reform Act. Lease contracts were extended indefinitely, thereby preventing land owners from substituting tenants or regaining full rights of ownership and use. The Land Reform Act set a rent formula which remained unchanged until the early 1990s. This formula sets maximum rents at no more than seven times the land tax.

In 1992, the Egyptian government proposed a new owner-tenant relationship law, and the people's assembly approved it. This new law will make it possible for owners of agricultural land to regain full rights of ownership and use over their rented land after a period of five years.

4. Land Distribution by Major Crops

Table 2-6 lists the crop patterns for 1970, 1980, and 1990. The total cropped area increased by about 10% between 1970 and 1990, reflecting new land development and greater intensity of cultivation.

Table 2-6 shows that the five most important crops in Egypt, in terms of area, occupied about 77% of the cropped area in 1970. The list includes berseem (25%); cotton (15%); maize (14%); wheat (12%); and rice (11%).

However, major shifts took place in cropping patterns from 1970 to 1990. Most important was the significant decline in area devoted to cotton—from 1.6 million feddans, or about 15% of total cropped area, in 1970, to less than one million, or about 8% of total cropped area, in 1990.

The area devoted to fruits increased by almost 165% during this period, and the areas dedicated to winter and summer vegetables increased by about 94% and 32%, respectively.

The quantity of space where wheat was grown remained stable during most of the period. However, in the last two years of the 1980s, this area increased to 1.96 million feddans, or about 50% higher than its level in 1970.

The area under rice cultivation increased rapidly during the 1960s as a result of increased water availability after the construction of the Aswan High Dam. However, a declining trend in the rice-growing area occurred during most of the 1970s and 1980s. The water shortage of the early 1980s reduced this area to its lowest level—837,000 feddans—in 1988. Availability of water and the introduction of new high-yielding varieties of rice resulted in an increase in space devoted to rice in 1989 and 1990.

The area devoted to maize increased substantially throughout the 1970s and was roughly stable for most of the 1980s. This trend reflects the higher profitability of maize relative to other summer crops because of its use as feed for livestock.

According to the findings of the 1981/82 agricultural census, about 63% of agricultural land in Egypt is cultivated by its owner, while approximately 31% is on cash lease. Only 6% is under share cropping.

The same census of 1981/82 provides a distribution of agriculture land according to its irrigation water source, and irrigation method used. As expected, more than 92% of agricultural land in Egypt depends on the Nile as the main source of irrigation water. Other sources include ground water (4.3%), drainage water (1.5%), and rainwater (2%).

The traditional method of flooding is used in more than 98% of irrigation. Other more efficient, non-traditional irrigation methods are relatively new and have been introduced only recently to Egyptian farmers. The share of modern irrigation methods could be larger if more recent data were available.

5. Old and New Land

The term “old land” in Egypt refers to the Nile Valley and Delta, while “new land” includes all land that has resulted from reclamation projects. The program of land reclamation added about 800,000 feddans during the 1960s and came to a complete stop during the 1970s, but by the end of the 1980s the total number of new feddans added was about 1,768 million *(Table 2-7)*.

Consequently, the total cultivated land area is estimated at 7.4 million feddans and total cropped area at 14 million feddan.

6. Agricultural Employment

Population growth continues to expand the labor force. With the steady growth in the population and labor force, the structure of employment in the economy has changed.

According to data derived from population censuses, agricultural employment declined from 4.9 million jobs in 1976 to 4.6 million in 1986. Agriculture’s share in total employment fell from 48% to 38% during the same period *(Table 2-8)*.

Moreover, the findings of studies of the Egyptian labor market have shown that the number of full-time agricultural workers declined during the 1970s and early 1980s, and that an increasing number of women participated in hired agricultural work, as well as continued their participation in on-farm work with livestock (Richards, 1991). However, the reduction in the size of the male agricultural labor force may have begun to reverse itself in the late 1980s.

The trends in nominal and real wages for agricultural workers are shown in *Table 2-9*, which shows that an increase in agricultural real wages occurred during the 1970s and early 1980s. With real wages in 1985 nearly three times higher than those of a decade earlier, nominal wages grew at over 9.5% per year from 1975 to 1985. *Table 2-9* shows that the growth of real wages reversed itself after 1985: real wages in 1989 were about 41.3% below those of the peak in 1985 and almost equal to their level in 1980.

Many reasons have been suggested to explain this rapid rise of real agricultural wages in Egypt. Among the causes cited:

1. Higher oil prices in the 1970s and early 1980’s led to a regional boom that included oil exporting Arab countries. The demand for labor was high in those countries at that time and a large number of rural men migrated. A recent study by Adams (1991) on international migration in Egyptian agriculture shows that 339 out of 1,000 surveyed households sent someone to work abroad in the 10 years prior to the survey (1986). Most of the migrants went to work in one of the neighboring Arab oil countries—Iraq, Kuwait, Libya or Saudi Arabia and thus generated a return flow or remittances. International remittances are defined here as “all transfers of money and goods from international workers”. These remittances play an important role in the economies of the surveyed households, accounting for 12.5% of total actual gross income of the 1,000 households and for 30.4% of total actual gross income of the 339 households with migrants (Adams, 1991). These remittances stimulated the derived demand for off-farm employment. The share of non-agricultural employment in rural areas increased from 25% to 40% of total employment. Social services and manufacturing were the largest sectors of employment outside agriculture *(Table 2-10)*.

2. Egyptian government policy which, in urban as in rural areas, continued to create government jobs at a very rapid rate.

3. Among other less important reasons suggested to explain the observed increase in real farm wages were land reclamation projects added new demand for agricultural labor; changes in the cropping pattern towards more labor intensive commodities such as fruits and vegetables; and increase in wages in construction.

The largely supply-side determined rise in real wages for agricultural labor resulted in some important developments in Egyptian agriculture in the 1970s and 1980s. The most important among these developments were that agricultural labor share in total cost increased, and that machines substituted for increasingly scarce labor in agricultural production.

Table 2-11 presents labor's cost share for four major crops—maize, cotton, rice and wheat—from 1970 to 1989. Data in this table indicate that labor cost share increased dramatically from 1970 to 1985. Then, a reversal of the trend is observed as a result of new developments in the agricultural labor market in the second half of the 1980s.

Another possible consequence of rising farm wages was agricultural mechanization. *Table 2-12* shows that mechanization has spread rapidly in Egypt. Most of this mechanization has been "tractorization", although the use of irrigation pumps and small threshers have also become increasingly common. Several studies show that most mechanization substitutes machines for animals rather than labor (Antle and Aitah, 1988).

7. Productivity

Agricultural productivity is the effectiveness with which farmers combine their resources to produce agricultural commodities. Thus growth in agricultural productivity should be of great concern to policy makers, particularly in a country such as Egypt, with limited resources and growing demand for food and other agricultural products.

There are two types of productivity: partial productivity and total factor productivity (TFP). The ratio of output to a single input is called the partial productivity of that input, and the ratio of output to all inputs combined is called total factor, or multifactor, productivity. There are many partial productivity measures such as labor productivity, land productivity, capital productivity, and others. However, in most agricultural productivity studies the discussion is devoted only to one partial measure, namely, labor productivity. In fact, labor productivity is a useful index and a good indicator of efficiency. But the usefulness of this measure is dependent upon two important conditions: that all other resources constitute a small fraction of total input, and that the amounts of other resources remain unchanged. Since there are ways other than labor efficiency by which a farmer can increase productivity, all inputs should be considered when measuring productivity.

This section will first consider partial productivity measures, then total factor productivity will be discussed. This section, in fact, focusses on a summary of major findings of a study by experts from the Egyptian National Planning Institute (NPI), entitled "A Study of Some Productivity Issues: the Egyptian Economy". The discussion of land productivity and the Egyptian cotton problem was not part of the NPI study.

Labor productivity in Egyptian agriculture has been the subject of many studies. For example, Mongi (1983) reports an average annual growth rate in agricultural labor productivity of 0.8% from 1960 to 1979. Results of another study by CAPMAS (1985) show that agricultural labor productivity has increased by about 1.9% annually from 1960 to 1980. Soliman et al. (1987), studying almost the same time period (1965-1982), reports an estimated 2.2% increase.

Comparing the results of these studies to the findings of the NPI study presented in *Table 2-13*, one recognizes the fact that the NPI estimates represent the upper limits of productivity growth figures.

Moreover, the highest rate of growth in labor productivity was from 1966/67 to 1973. This was due to high levels of investment in agricultural infrastructure during the 1960s (i.e. during construction of the Aswan High Dam). As agricultural investments declined during the 1970s, so did growth in the agricultural gross domestic product and in labor productivity.

Table 2-14 shows average annual growth rates of capital productivity in Egyptian agriculture from 1966 to 1987. Data in this table suggest that growth in capital productivity was limited but positive during the first and second periods. However, the period 1981/82-1986/87 is characterized by a negative growth rate.

To explain this phenomenon, one should take into account the fact that, in agriculture, production obeys the law of decreasing returns—if not to scale, at least to each factor of production. Diminishing returns to a factor means that if this factor is increased, and all other factors are kept constant, productivity of this factor will fall.

From 1967 to 1990, total production per feddan (land productivity) increased by a factor of 36% for rice, 59% for maize, and up to 79% for wheat. Yields of most other crops increased during the same period. However, a close look at *Table 2-15* shows that most of these yield improvements took place during the second half of the 1980s. A combination of higher prices for producers, trade and marketing reform measures, and comprehensive research and extension programs to develop and introduce new high-yield varieties (HYV) produced these production increases.

The cotton yield increased during the 1970s and early 1980s, but since then a significant decline has been observed. This downward trend in cotton yield coupled with declining area devoted to cotton during the same period resulted in lower production levels. Another section in this study discusses the Egyptian cotton problem and its implications.

Total factor productivity (output per unit of all inputs) provides an aggregate measure of the progress a particular sector or economy is making in the development process (Langham, 1983). The results shown in *Table 2-16* indicate that the average annual growth rate of total factor productivity in Egyptian agriculture was relatively low and declined to the extent that it became negative during the third period (1981-1987). It is argued that capital use in Egyptian agriculture was more than the level needed for the optimum combination of production inputs. This extra capital was estimated at 20% during the years 1981-1987 (NPI, 1990).

8. The Egyptian Cotton Problem

Egyptian cotton has been the most important export and cash crop in Egypt for many years. It is also the source of raw material for many industries such as weaving and spinning, ginning, oil and fodder industries, and many other related services and activities. The total number of workers in this sector is about 386,000 or about 3% of the total labor force. Direct employment in the cotton crop industry constitutes not less than half the labor force in the agricultural sector (NBE, 1990).

Table 2-17 shows the general decline in cotton acreage from 1.6 million feddans in 1970 to about 0.99 million feddans in 1990 (a fall of 37.5%). Productivity per feddan also decreased from 7.21 to 5.21 kentar with a decline of 27.7% between 1982 and 1990. By the end of the 1980s, cotton production was recorded at its lowest level of 5 million kentar. This represents only about 55.6% of the 1972 production level of 9.028 million kentar. This decline in Egyptian cotton production, with increasing domestic consumption, resulted in a decrease in exports and an increase in cotton imports.

The volume of Egyptian exports decreased during the 1980s from 782,000 international bales, accounting for 3.9% of international exports in 1980/81 to only 211,000 international bales, accounting for no more than 0.9% of international exports in 1989/90 (NBE, 1990).

Egypt has been the leading country in the production and exports of long and extra-long staple varieties of cotton for many years. *Table 2-18* shows how the Egyptian position in this market changed during the 1980s. Egypt's production of these varieties decreased from 59.2% of international production in 1980/81 to 27.2% in 1989/90. Moreover, after supplying 64.4% of international exports of these varieties in 1982/83, Egypt's share of international exports declined to only 14.7% in 1989/90.

This poor and deteriorating performance of the Egyptian cotton sector has been the subject of many studies (NBE, 1990, and Gendy and Ashmawi, 1992 are two examples). Among explanations suggested for this performance are:

1. With respect to the decline in area planted to and yield of cotton during the 1980s reasons can be summed up as follows:

a. As a result of government price policy and the continuation of intervention in the Egyptian cotton market, while at the same time almost all of the rest of the agricultural sector had been liberalized, farmers prefer to cultivate other unpriced, uncontrolled crops that yield higher profits.
b. The common Egyptian farmer diverts government-subsidized inputs away from cotton areas into more profitable crops such as corn and vegetables.
c. The spread of pests leads to excessive use of pesticides, thus negatively affecting crop yield.
d. The existence of some low-yield strains and seeds affects land productivity.
e. The Egyptian government allocates low, irregular and declining funds for cotton research. *Table 2-19* shows funds actually spent on cotton research from 1979 to 1987/88, as indicated by the Cotton Research Institute's budget. This is the only institute in Egypt concerned with developing new high-yield varieties of cotton. Funds allocated by this institute indicate this objective was assigned very low priority during the 1980s.

2. Among the reasons for the decline in the Egyptian cotton share on the international market during the 1980s are:
   a. Low and declining productivity per feddan and decreases in cotton area resulted in declining production, while increasing domestic consumption needs of cotton reduced quantities available for exports.
   b. As Egyptian cotton exports declined, new countries entered the field of producing and exporting cotton.

9. Infrastructure

"Infrastructure" is the whole body of social arrangements and of physical means within which the social and economic life of the nation and the individual takes place. Infrastructure to the farmer comprises such goods and services as agricultural research and extension, agricultural credit, irrigation system structures, markets, supplies of inputs, transportation, and other elements. This section discusses briefly some of these elements, including its historical development and current state.

10. Transportation Network

Egypt has the oldest railway system in the region, dating back to the Suez Canal in 1969. The system was expanded from 4,385 kilometers in 1975 to 7,726 kilometers in 1988/90. However, the railway's share of agricultural products had declined during the same period. In 1975, the total amount of agricultural commodities and inputs transported by Egyptian railway was 901,525 thousand tons/kilometer, and in 1989/90 this amount declined to 654,815 thousand tons/kilometer (CAPMAS, 1991).

Reasonable roads connect Cairo with Alexandria, Suez, Ismailia, Port Said and other Delta Towns, and with Aswan. There were 23,296 kilometers of paved roads in 1987 and about 38,908 kilometers, of roads overall (Farag, 1990).

The navigable waterways of Egypt total about 3,350 kilometers, divided almost equally between the Nile and the Canals (Farag, 1990). Alexandria is the most important port, with the largest water area of any Mediterranean harbor and annual traffic of about 18 million tons. Port Said and Suez are the second and third largest ports. Port development is being undertaken at Alexandria and new ports are being developed at Damietta and Dakahlia (*Economist*, 1990).

Egypt has 15 airports. The largest one is Cairo International airport, which handles about 70% of all air traffic. Alexandria, Luxor, Port-Said, Awan, Abu Simbel, Ghardaka, New Valley, Raas Nasrany, El Arish, El Goraa, Raas El Nakab, Saint Katherine, Marsa Matrouh and El-Tor have smaller airports (CAPMAS, 1991).

11. Irrigation Structures and Drainage

The Egyptian agricultural sector is unique with its almost total reliance on irrigation from the Nile. An extensive system of public water delivery canals has been established throughout the country to bring water to every village.

To control the geographical distribution of the water supply, and to feed the canals with the quantities of water required, a set of barrages were constructed at different places on the Nile. The Delta Barrage, the

first to be constructed, was completed in 1983. Additional barrages were built at Zifta (1903), Assiut (1903), Esna (1903) and Edfina (1951).

The first big dam was constructed in 1902 at Aswan. The storage capacity of this dam was 1 billion cubic meters, but the capacity has since doubled; in 1912 it was 2.5 billion cubic meters, and in 1933 it was 5.5 billion cubic meters. Building the jebel Aulia dam in Northern Sudan in 1937 increased total storage capacity to 7.5 billion cubic meters. The Aswan High Dam (AHD), built in the 1960s, provides a further 55.5 billion cubic meters to Egypt.

Experimental stations have been established to study water requirements of main crops. Official irrigation requirements are calculated on the basis of 9,300 cubic meters/feddan for upper Egypt. 7,300 cubic meters/feddan for middle Egypt, and 6,720 cubic meters/feddan for lower Egypt. Water requirements for main crops vary from 970 cubic meters/feddan for broad beans to over 16,800 for sugarcane (CFP, 1989).

Irrigation water has historically been supplied free to Egyptian farmers, and its use is a function of its availability in the canals. Hence, there is always a tendency to supply excessive amounts. Consequently, water logging and salinity are serious problems. The seriousness of the drainage problem became clear in the late 1960s and has grown since. A system of open public drains (extending over 15,000 kilometers) has been established to discharge drainage water, either freely or through the use of pumping stations (World Bank, 1989). Such drainage has proven insufficient to counter these problems.

In addition, only 2% of the cultivated land is irrigated by modern methods, which concentrate on selective watering rather than wasteful flooding. Thus, it is not surprising to find that Egypt's efficient use of available water is about 50%. The entire irrigation system is badly in need of renovation and maintenance and improved irrigation techniques are also required. To alleviate these problems, the Second Five-Year Plan (1987-1992) has allocated L.E. 1.4 billion (*Economist*, 1990), and the Irrigation Improvement Research Projects received funding from several international aid agencies. Both projects show some promising results.

12. Agricultural Research and Extension

The first step towards building a solid agricultural research base is having a good agricultural education. In Egypt, formal agricultural education has a long history; Mohammed Ali established the first agricultural school in 1829. This school had been closed and reopened several times in several locations (IDRC, 1983).

In 1889, the agricultural school in Giza was established with a farm of 2000 feddans. At present there are 15 colleges of agriculture, in addition to two institutions, one for agricultural extension and another for agricultural cooperation. The number of graduates of agricultural colleges increased from 361 in 1950/51 to 5,348 in 1988/89 (CAPMAS, 1991).

The private sector took the first initiative in the area of modern agricultural research by establishing the Agricultural Society in 1898. On the government side, a Department of Agriculture was established in 1910 with mainly research and extension functions; three years later this was expanded into a full-scale ministry. In 1919, in response to cotton productivity deterioration, the Cotton Research Council was established. This council's name was changed in 1927 to a Plant Breeding Division, with experimental farms in Giza, Sakha, Sids and Malawy. In 1971, the administration of all its research functions was unified under the General Authority for Agricultural Research.

In a major reorganization in 1982, the Agricultural Research Center (ARC) was made responsible for all state farms used for the production of foundation seed for field crops and seedings for horticultural crops. Then, in 1983, it was given broad authority over all agricultural research and extension activities in the country. The ARC currently constitutes the biggest research apparatus of any kind in Egypt, employing about 5,000 research staff (World Bank, 1989). It comprises 14 institutes and four central laboratories. The ARC controls 31 research stations: 13 working on field crops; 7 on horticultural crops; and 11 on animal production.

ARC institutes cover research in the following areas: cotton, sugar, horticulture, field crops, soil and water, plant pathology, crops, plant protection, agricultural mechanization, animal production, animal health, animal reproduction, serum and vaccine, agricultural economics, extension and rural development. The central laboratories deal with pesticides, experimental design, protein and feed analysis, and genetic engineering.

Outside the Ministry of Agriculture, research related to agriculture is also carried out at 15 agricultural colleges and six university Faculties of Veterinary Medicine, the Water Research Center of the Ministry of Public Works and Water Resources, the National Research Center (NRC) of the Academy of Scientific Research and Technology (which also has an Institute of Oceanography and Fisheries), the Agricultural Planning Division in the Institute of National Planning, the Rural Sociology Research Unit in the National Center for Sociology and Criminology Research, and the Desert Institute. The Desert Institute, after being affiliated with several other departments and Ministries, was returned to the Ministry of Agriculture in 1986. In addition to this institutional research, there are about six private sector companies involved in agricultural research activities, including the Pioneer Seed Company and Ciba Geigy (CFP, 1989).

Egypt is one of the few developing countries that has not had difficulty in training enough qualified staff. Approximately 3,200 scientists and 4,400 assistants were working on agricultural research in Egypt in 1982 (IDRC, 1983). However, the ability of these qualified scientists to conduct meaningful research is limited by a number of constraints: low salaries, shortages of funds for research, inadequate libraries, and poorly equipped laboratories. The lack of sufficient resources is the most important constraint on agricultural research in Egypt. Even in nominal terms, the budget of ARC dropped by about 20% in fiscal year 1986/87. In real terms, allowing for inflation, it has fallen by at least half since 1982/83 (FAO, 1990).

Even under these constraints, there are some impressive achievements in agricultural production that are a direct result of applying research findings. One well-known example is the increased returns resulting from the development and release of a single new cotton variety, such as Karnak or Menoufi. It is estimated that this increased return outweighs the cumulative budget for the Ministry of Agriculture since its founding in 1913 (World Bank, 1989). Average wheat yields were raised from 5.18 Ardab in 1952 to 14.56 Ardab in 1990. Maize yield rose from 6.31 Ardab in 1952 to 17.4 in 1990. Rice yields were raised from 1.43 tons in 1952 to 3.06 tons in 1990. Application of nitrogen fertilizer rose from 648,000 tons in 1952 to 5 million tons in 1989, and that of phosphate from 92,000 to 1,204,000 tons (CAPMAS, 1991).

The number of farm animals has also increased considerably. Between 1952 and 1988, the numbers of cattle, buffaloes, sheep and poultry about doubled. This increase was made possible by improvements in animal health measures and in animal feed research. In 1990, the Rice National Production Campaign raised average yields to 4.54 tons per feddan, or 48% higher than the national average. This increased yield is attributed to the use of new seed varieties (Giza 181, Giza 175, 2175 and 1368) developed by the ARC (ARC, 1990).

Similar field demonstrations across the country of new varieties of wheat have achieved average yields 60% above the national average. Varieties such as Giza 157 and Sakha 8, 61 and 69 are contributing to a steady rise in productivity. Newly introduced apples, bananas, cucumbers, grapes, and tomatoes are showing impressive increases in productivity up to 200% (FAO, 1990).

Agricultural extension plays an important role in development. For example, once new techniques are developed, farmers should be acquainted with the technologies and shown how to get the most out of them. Maintaining close links between research and extension bodies is essential to development.

In Egypt, coordination between research and extension has not always been adequate. In the 1980s, several steps were taken to improve the links between them. Both activities are now the responsibility of the same organization, the ARC. Researchers are now required to participate in problem identification and technology validation and demonstration. Regional experimental stations serve as centers for dissemination of technology in their respective zones. They produce all of the foundation seed and part of the certified seed for major field crops, and at least 60% of the supplies of seedings for horticultural crops. Short training courses are offered by the ARC for extension staff at the central and regional levels through the Integrated Commodity Program.

Average rice yields have been increasing since the mid-1980s. Recent significant improvements are due largely to a comprehensive research and extension program to develop and introduce new high-yield varieties. These high-yield varieties were developed through research at the Rice Training Center (RTC) at Sakha, at universities, and other research centers. Certified seeds resulting from the research were developed and distributed to farmers. In addition, new cultural practices were developed and extension programs were used to educate farmers on improved production practices and to encourage them to adopt these techniques. In 1990, over 20% of the rice area in Dakahlia, Behira, Kafr El Sheikh, and Gharbia was planted with the new higher-yield rice varieties. As the area planted with higher-yield varieties expands, the national average should continue to increase (ARC, 1990).

13. Parastatal Marketing Institutions

In Egypt, it is often claimed that over 90% of the agriculture sector is in private hands. This is probably true in terms of land ownership, where State control is limited and decreasing. A careful look will show that the scope of public sector involvement in agriculture marketing and distribution is very extensive, although the private sector share in food distribution has been increasing during the 1980s *(Table 2-20)*.

The Ministry of Supply is responsible for most basic food commodities (wheat, cooking oil, rice, sugar and meat), as well as many other foods. The General Authority for Supply Commodities (GASC) both purchases locally-produced crops and imports many food items. The commodities are then distributed by two Ministry of Supply wholesale companies. These two companies own and operate their own warehouses and transport fleet. Both are responsible for storing, packaging and distributing commodities to private and public retail stores. Another group of parastatals is responsible for exporting most of the Egypt's agricultural products. Under the control of the Ministry of Economy and Foreign Trade, cotton is exported only by the Egyptian State Cotton Organization. Two companies—El Wadi and El Nile—handle rice, orange and vegetable exports, although the private sector also exports oranges and vegetables.

In addition to controlling most local distribution and exporting, the Government is deeply involved in processing most agricultural commodities. There are major sub-sectors where parastatals have monopolistic control, such as milling almost all marketed rice and most wheat. In other cases they appear to have preferential treatment. El Nasr Company for preserved foods (Kaha) and Edfina Company under the Ministry of Industry control most vegetable and fruit processing in the country. Private sector participation in food processing has increased recently.

The Principal Bank for Development and Agricultural Credit (PBDAC) is the most important parastatal in Egyptian Agriculture. It is controlled by the Ministry of Agriculture and Land Reclamation (MOALR). PBDAC acts as a holding company with 17 affiliated governorate banks, which operate a network of some 750 village banks. PBDAC distributes most basic agricultural inputs to farmers; acts as a marketing agency for selected crops; and supplies and controls credit to farmers. PBDAC is also the largest distributer of seed, feed, fertilizer, pesticides, agricultural machinery, and jutbags. All the inputs distributed by PBDAC are, to different degrees, subsidized. PBDAC has a large and extensive distribution network throughout the country. The system is organized at three levels—governorate warehouse, district *shounas*, and village *mandubias*—providing a total of almost 560,000 tons of storage space.

There are 65 governorate covered warehouses, which are usually about 1,000 square meters in area. Moreover, 476 *shounas* are distributed across the governorates with a total covered or partially covered storage capacity of 330,000 tons. These *shounas* are mostly fenced open areas ranging in size from 2,000 to 20,000 square meters. The *mandubias* are retail outlets allocated to 4,312 villages. They rarely offer any form of covered storage (MOALR, 1989).

The animal feed business has been almost entirely a public sector activity, with animal feed being produced by the Ministries of Industry and of Supply mills and with Ministry of Industry feed distributed by PBDAC. Within the recent past, the private sector share has been increasing, especially in the poultry industry.

The village banks allocate fertilizers and pesticides at subsidized prices in accordance with the Ministry of Agriculture recommendations. The private sector's role in input distribution is least developed with regard to fertilizer. Its role is limited to importation and distribution of some fertilizers used on horticultural crops.

The private sector's share in seed distribution had increased to a considerable degree. Some 75% of vegetable seed and the majority of pesticides used on fruits and vegetables are provided by the private sector (MOALR, 1989). The private sector's role in pesticides trade is limited by Egyptian law. Importing or distributing pesticides for "controlled" crops (cotton and sugarcane) is reserved for the public sector.

The private sector is most involved in agricultural machinery and equipment, with firms involved in importation, manufacture, assembly, distribution and after-sale service.

Until recent policy reforms, the marketing of controlled crops was a joint operation between PBDAC and the cooperative system. Village banks and the cooperatives set up receiving points for crops at *mandubias* and *shounas* where the crops were graded, weighed and paid for, deducting outstanding loans. Under the new system, in which only cotton and sugarcane are controlled, farmers are free to sell all other crops to the private sector, but PBDAC remains as a buyer of last resort with what are mainly floor prices set by the government.

Sugarcane marketing remains under total control of the sugar mills at set prices. Cotton marketing remains fully controlled, while rice marketing was liberalized in early 1991.

14. Agricultural Credit

The PBDAC system is the only source of institutional agricultural credit available to small farmers. This institution makes short-term, medium-term and long-term loans to farmers at subsidized rates of interests.

Total quantities of credit provided by PBDAC from 1980/81 through 1987/88 are given in *Table 2-21*. Short-term credit has increased each year, but the biggest increase was in 1986/87. Another significant increase occurred in 1987/88. In the first part of the period, most of PBDAC's short-term credit was subsidized. The percentage subsidized fell in the following years, but in the last two years the percentage subsidized rose to 46% (1987/88). The same table indicates that medium-term credit grew for most of the period, substantially increasing in 1986/87 but declining to its earlier level in 1987/88.

Credit subsidies were calculated using the differences between subsidized and unsubsidized interest rates for each type of credit. *Table 2-22* shows that nominal credit subsidies doubled from 1981/82 to 1985/86, and then doubled again in 1986/87. In 1987/88 subsidies fell by less than 2%.

Loan repayment is virtually ensured for short-term loans because farmers have not been able to obtain subsidized inputs from any other source and non-repayment means loss of access to these sources. Moreover, the Bank is able to deduct loans from crop produce sales to the Bank. As a result, repayment rates run as high as 98%.

In 1987/88, 75% of fertilizer credit was provided on an in-kind basis. Generally the inputs are provided in kind and field operating costs such as labor for harvest are advanced as cash loans (CFP, 1989).

Studying the distribution of investment loans granted by PBDAC from 1981/82 to 1987/88 shows that livestock projects received the largest share of these loans followed by poultry projects and mechanization. This ranking reflects the protection enjoyed by livestock projects then (NPI, 1990).

The PBDAC has followed a very conservative lending policy. Loans for farm equipment for example require 50 feddans security for tractors and three feddans for water pumps. These policies limit the ability of small farmers and tenants to obtain credit for mechanization or other medium- and long-term credit. The village banks are highly bureaucratic and inflexible. The "Supervised Credit Approach" of PBDAC has been subject to criticism. By supplying a fixed package of inputs, this approach stripped farmers of important choices. Moreover, by obliging PBDAC to check on the use of the input it supplied, supervised credit actually raised the costs of administering loans (Sadowski, 1991).

The discussion thus far has been limited to the 1970s and 1980s up to 1988/89. Implementing the Agricultural Policy Reform Program resulted in major changes with respect to PBDAC: PBDAC input distribution functions will be phased out and private sector firms will be encouraged to take over these tasks: input subsidies have been reduced, and interest rates were liberalized in 1991. Even though PBDAC conti-

nues to offer subsidized credit, its interest rate is now closer to market rates: 20-21% for investment projects, 11% for land reclamation, 15% for mechanization and 17% for other activities and crops. Farmers are no longer required to deliver any portions of their crops to PBDAC with the exception of cotton. Under these new conditions PBDAC is expected to have some adjustment problems with higher credit risks and lower repayment ratios (Sidik, 1992).

15. Agricultural Cooperative Institutions

The history of the cooperative movement in Egypt goes back to the beginning of this century. At that time, the Agricultural Bank of Egypt was established to provide farmers with credit. However, for the majority of the peasants, small loans were almost impossible to obtain.

In 1909, the first cooperative was founded to provide credit to its members. By 1914, the number of cooperatives in the country had increased to 23. However, the lack of direct government support, the absence of legislation to organize and guide such cooperation institutions, and other financial problems were mainly responsible for the limited acceptance of the idea.

Government support for the cooperatives started in the 1920s. Several laws and decrees were passed to regulate the activities of the cooperatives. A Cooperative Department at the Ministry of Agriculture (MOA) was given the authority to supervise the existing cooperative societies. The government also provided credit to cooperatives through a non-specialized bank until the Egyptian Agricultural Credit Bank was established in 1931. By the mid-1940s, there were over 2,500 cooperatives in Egypt, involving 800,000 farmers (World Bank, 1989).

The national network of cooperatives expanded as a result of the Land Reform Act of 1952. This law made participating in a cooperative obligatory for all beneficiaries of land reform. The main functions of these cooperatives were to provide farmers with inputs on credit; to organize and supervise cropping patterns; and to buy outputs from farmers under terms determined by the government. The cooperative functions during this period also included deducting from the revenues the price of land (Land Reform Law), land tax, agricultural loans, and other debts.

The Egyptian Agricultural Credit Bank was nationalized in 1961. Between 1961 and 1976, the Bank dealt only with agricultural cooperatives and was not allowed to deal with individual farmers. The Bank distributed inputs to the cooperatives on credit and the cooperatives redistributed the inputs on credit to its members. In 1976, the Bank's name was changed to the Principal Bank for Development and Agricultural Credit (PBDAC). 1976 Law No. 117 was issued to establish village banks and to allow PBDAC to deal with individual farmers. PBDAC took over all storage facilities of the agricultural cooperatives and their offices. Supervision of cropping patterns and estimating farmer's needs of agricultural inputs were the only functions left for the agricultural cooperatives after 1976.

The Government passed another law in 1980 (Law No. 122) to organize all types of agricultural cooperatives in Egypt. The 1980 law provided the cooperatives with the power to restore their ownership of storage facilities and their function of distributing agricultural inputs with a 5% commission (CFP, 1989). In a recent study (CFP, 1989) the total number of agricultural cooperatives in Egypt was estimated at 6,419 cooperatives. This includes Land Reclamation Cooperatives (440), Land Reform Cooperatives (779), and some 5,200 under the Agricultural Credit Cooperative System. The Central Agricultural Cooperative Union is at the top of the agricultural cooperative structure and is in charge of promotion, training, and coordination of the agricultural cooperative movement in Egypt.

Looking back at the early years in cooperative movement history, one can identify the absence of government involvement and support as one of the major causes of its limited success during those years. However, in the last four decades the government has used cooperatives to implement agricultural policies. Government control has limited effective popular participation, the corner-stone of any cooperative organization. The effects of too much government intervention in the cooperative movement on the agricultural sector of Egypt were in the most part negative. As early as 1969, the Institute of National Planning published a critique of cooperatives, accusing them of interfering with private marketing, bureaucratic abuses, and of being used by the government for fiscal purposes. Intervention and controls were viewed merely as distortions to agricultural incentives, leading to loss of income for farmers (World Bank, 1989).

III – Economic Performance Indicators

1. Growth Indicators

The average annual growth rate of GDP was about 7.4% from 1970-1980 (World Bank, 1992). However, the 1970s should be divided into two periods: the early 1970s (1970-1973), which were characterized by sluggish growth—probably less than 3% per year—and the second period (1974-1980), when Egypt achieved an eight to 9% growth rate of GDP in real terms *(Table 3-1)*. These years of prosperity brought increasing investments and public consumption and a higher standard of living. The main sources of income for these years were oil exports, remittances, Suez Canal tolls, tourism receipts, and foreign aid.

In the early 1980s a sharp reversal of the prosperity of the 1970s led Egypt into deep economic crisis. Declining oil prices leading to their later collapse in 1986 reduced Egypt revenue from oil exports. Other sources of foreign exchange also showed similar trends. As a result of the drop in export earnings, economic growth fell sharply.

Since 1986, real GDP growth has been less than 3% a year, investment has dropped sharply, inflation has been running at over 25% a year, per capita national income and consumption declined in real terms, and external indebtedness has grown to US$ 49 billion or 154% of GDP in 1989 (see *Table 3-2*). According to the World Bank classification of nations, Egypt moved downward from the middle-income countries group to the low-income group as of 1990 as a result of its GNP per capita declining below the $610 mark.

The Egyptian economy's rapid deterioration during the latter half of the 1980s has more than one explanation. It is clear that policy makers failed to take advantage of the boom years to reduce the economy's vulnerability to external shocks. Government policies, probably based on the misconception that external conditions would be favorable for a long time, contributed to the economic stagnation and decline of Egypt in the 1980s. Inflated public spending in the 1970s and early 1980s created large budget deficits, intensified inflationary pressures, and undermined the balance of payments.

Moreover, the use of foreign loans to finance the current account deficit increased external debts. The pervasive systems of price control, distorted allocation of resources, unrealistic exchange rate, and the lack of proper incentives prevented the development of a large diversified export sector (for more discussion of this point, see Lavy and Sheffer, 1991).

2. Economic Planning In Egypt

The first full-scale economic plan was the 1960/61-1964/65 five-year plan. Because of foreign exchange difficulties and the 1967 war, the second plan (1965/66-1969/70) was prepared but never implemented. After 1973, planning became a short-term matter.

The planning system during the 1960s and 1970s suffered from several weaknesses. Firstly, the plans were in fact little more than a list of investment projects. They were not comprehensive. Secondly, in the case of planning during the 1970s, the policy-making process was dominated by short-term *ad hoc* decision-making, within the framework of annual budgets. Finally, insufficient attention was given to optimal investment criteria (Rivlin, 1985).

In the late 1970s a transition plan paved the way for two successive five year plans (1982/83-1986/87) and (1987/88-1991/92) focussing on long-term development. While the first plan concentrated on enhancing the economy's rate of growth and improving Egypt's infrastructure, neglected during the war years, the second plan emphasized economic reform and providing stability for the economy, while avoiding the accumulation of new debts (*Economist*, 1990). Some progress was made during the 1980s toward economic reform and improving infrastructure, but the reforms were too small to affect the fundamental nature of the Egyptian economy which continued to be government-dominated.

3. Investment Allocation

The allocation of investment has been partly responsible for sectoral performance in the Egyptian economy. *Table 3-3* shows sectoral shares of fixed investment from 1959-1991.

Compared to other sectors, agriculture has shown the slowest growth, with an average increase of about 2.7% per year between 1965 and 1980. Services in contrast, grew by an average of more than 13.7%, and industry by 6.9% per year (World Bank, 1992).

During the 1980s, performance levels declined in all sectors and the same pattern continued, i.e., services with the largest share in investment have shown the fastest growth (about 6.7%), while agriculture grew by an average of about 2.5%, and received the smallest share of investment.

Government investment in agriculture and irrigation has been very modest during the last two decades. In fact, following the completion of the Aswan High Dam, public investment in agriculture declined. The share of agriculture, and irrigation in total public investment fell from about 23% in the mid-60s to about 8% in the mid-70s. Much of the 60s investment, after the completion of the Aswan High Dam, was allocated to the reclamation of new lands. However, during the 1970s, the government reversed its investment strategy, de-emphasizing land reclamation and initiating a country-wide drainage program to solve problems of water logging and salinity. Since 1982/83 there has been a moderate increase of investment in agriculture. This increase reflects resumption of large-scale land reclamation efforts, and increases in private sector investment, especially in the area of mechanization and livestock.

It is clear that development of Egypt's agriculture requires rates of public investment substantially higher than the 9% of recent years. More investment should be allocated to human capital development in rural areas and agricultural research and extension.

4. Government Finance

The key indicator for the domestic economy is the budget. *Table 3-4* shows government finances from 1970-1990. Some major trends can be identified:

1. Total government expenditure as a percentage of GDP increased from 32% in 1970 to a high 64% in 1981/82, and remained close to that level for most of the 1980s. Expenditure as a percentage of GDP declined from 1988 to 1991.

2. Government revenues increased from 25% of GDP in 1970 to attain its highest level of 43% of GDP in 1980/81, after the second oil shock of 1979. Oil market developments caused a declining trend throughout the 1980s, and by 1990/91 revenue as a percentage of GDP was only 33%.

3. The public deficit rose from 6% of GDP in 1971 to a high of 31% in 1975. During most of the 1980s, the deficit exceeded 20% of GDP. The most recent data (1990/91) puts it close to 10% of GDP. These deficits reflects various factors:

   a. Declining revenues from oil exports during the 1980s. From 1974 to 1984/85, crude oil production rose from 7.5 million tons to 43.7 million tons. Between 1974 and 1980, the price rose as well, peaking in 1981 at $38 per barrel. The next five years witnessed a declining trend, and by 1986 oil prices were below US$ 10 per barrel. The volume of production also fell (World Bank, 1986).

   b. The increasing gap between public sector savings and its investment expenditures or the public sector savings-investment gap. A public sector investment program can be financed through three sources: public sector savings; private savings; and foreign savings. It is well known that there is a potential trade-off between financing of public investment and private investment. Excessive public borrowing could have real crowding out effects on the financing of private investment (World Bank, 1984). *Table 3-5* shows the widening of the public sector savings-investment gap from 1976-1982/83.

   c. Growth in consumer subsidies particularly for food. Many previous studies show that the Egyptian government provides many types of subsidies: direct and indirect; explicit and implicit; producer and consumer subsidies, etc. Direct subsidies refer to those subsidies for which specific allocations are made in the budget (Alderman and Von Braun, 1984, Carr, 1990, and El-kholei, 1990). Subsidies are awarded to certain public sector organizations to enable them to sell certain goods or services to consumers or producers at prices usually lower than procurement costs. The major recipient of these subsidies are the General Authority for Supply Commodity (GASC), which is responsible for the provi-

sion of subsidized foods. Other recipients include Cairo and Alexandria Public Transportation Authorities (transportation services), the Agricultural Credit Corporation, the Agricultural Stabilization Fund (agricultural inputs), the textile corporation (textiles and clothing), the Petroleum Corporation (bottled gas and kerosene), the Cooperative Building Authority (housing credit), and others. The overall magnitude of the explicit subsidy burden is presented in *Table 3-6*.

Indirect subsidies do not require funding by the government. These subsidies are provided through administrative price-fixing of specified final products or inputs produced by public sector firms. Examples of implicitly subsidized goods include petroleum products, electricity, raw cotton, etc., the subsidy being equal to the difference between international market prices and domestic selling prices. Another example of implicit subsidization is the evaluation of subsidized goods imported using an exchange rate that is below open market rate. In 1986/87, the value to Egyptian consumers of all implicit subsidies provided by the government of Egypt was about L.E. 8.5 billion. The implicit subsidy burden was estimated to have risen to L.E. 13.5 billion by 1988/89 (Carr, 1990).

d. The economy, despite its rapid growth during the 1970s and early 1980s, provided insufficient employment opportunities in the two most dynamic sectors (oil production and the Suez Canal). The two combined employed less than 1% of the labor force. Over half of the additional labor force was hired by the government itself (World Bank, 1989), which has led to over staffing of government agencies and public sector firms, and an increasing budget deficit.

The large reliance on bank financing *(Table 3-7)* has caused an expansion in the supply of money at a rate faster than the rate of expansion of demand for money. This imbalance has generated significant inflationary pressures, causing problems for resource allocation as well as income distribution. On the other hand, the policy of deficit financing induced a depreciation of the exchange rate and decreased net foreign assets.

5. Interest Rates

The Egyptian government was in control of all bank deposits and lending rates throughout the period 1970-1990. With the exception of the early 1970s, which was characterized by low inflation, interest rates have been significantly negative in real terms, despite a number of increases over the years *(Table 3-8)*.

These low interest rates relative to inflation discourage savers from depositing their savings in banks and direct savings into real estate, or other real assets, and encourage capital flight. Furthermore, the government, after adopting a unified loan rate for all activities, started in 1983 to use different rates for activities in different economic sectors. This change in policy was an attempt to support the so-called “more productive sectors” of the economy, or industry and agriculture *(Table 3-9)*. However, experience from 1983-1990 suggests that the effect of sectoral discrimination in rates has been to discourage lending to the agriculture and industrial sectors in favor of sectors and activities to which the banks are allowed to charge higher rates of interest (USER, 1990).

In January 1991, the Egyptian Central Bank introduced new interest rates and credit reform measures. Ceilings on deposit and lending rates have since been abolished; the ceiling for the three-month deposit rate was moved from 8.5 to 12%; a treasury bill auction, open to all bidders, was introduced to support a system of market-based interest rates; and the Central Bank discount rate was set at two percentage points above the results of the T. Bill auction.

Some proponents of this new T. Bill auction argue that it could be used by the government as a tool for managing money supply, and for obtaining short term funds, replacing Central Bank financing with real resources. Others argue this approach has serious implications for the future of the Egyptian economy. Interest rates on T. Bills ranged from 17 to 19% during 1991. With these very high interest rates, the financial burden on the government will increase as a result of domestic debt service. As it increases the domestic debt, it could force the government back into more Central Bank financing, and thus higher inflation rates.

It should be taken into account that Central Bank financing is usually under many constraints: International Financial and Aid Organizations (i.e, World Bank, IMF, and USAID) are asking governments to reduce their

dependence on this kind of financing. Moreover, People Assembly's approval is required to use Central Bank financing.

However, using T. Bills to finance the budget deficit is under no such constraints. Therefore, the government will have no incentive to limit its expenditure or reduce its deficit as long as it can finance it from real resources. Thus, using this approach for an extended period of time can result in a higher budget deficit. Private investment rates are expected to decrease as the private sector finds it more and more difficult to compete with the government for private savings, producing a crowding-out effect (Koraim, 1992 and El-Beblawi, 1991).

6. Money Supply Growth

Egypt experienced very rapid money supply growth throughout the 1970s and 1980s. From year end 1970 to year end 1980 the domestic money supply (M2) grew from L.E. 1.08 billion to L.E. 10.4 billion. By the end of the second decade (1990), the money supply had increased to L.E. 82.5 billion (IMF, 1991).

Financing the large and increasing government budget deficit was the force behind the money supply increase. The increase created additional demand which led to dramatic rise in prices. The Central Bank of Egypt (CBE) took measures to control inflation; consequently, the rate of growth in money supply has recently declined *(Table 3-10)*.

7. Inflation

Egypt had relatively modest inflation before 1973—about 3% annually—but then entered a period with a level of 10% per year for the rest of the 1970s, rose to 24% in 1986, and remained close to 20% for most of the 1980s *(Table 3-11)*. It should be taken into account, however, that figures in this table are not accepted by many observers who estimate the rate of inflation at a much higher level (i.e., inflation was estimated at 40% in 1990, more than twice as much as the rate reported here).

8. Exchange Rate Developments

The exchange rate and related regulations in Egypt have gone through several important developments during the last two decades.

The period from 1968 to 1973 represented a turning point in Egyptian exchange rate policy. Prior to this, all foreign trade was nationalized, the exchange rate was unified, and an administrative system of foreign exchange budgeting prevailed. However, increasing balance of payments pressure led to the application of multiple official rates in May 1968 in an attempt to achieve external balance and to control foreign exchange smuggling. An incentive rate was introduced to attract remittances, and in 1971 it was extended to include tourist receipts (Scobie, 1983).

In September 1973, the commercial exchange rate was created, the official rate set at L.E. 0.39 = $1 and L.E. 0.588 set for the commercial rate. This commercial rate was devalued in three steps, declining to L.E. 0.699 = $1 by December 1976.

In January 1979, the exchange rate structure was revised. A further devaluation took place in a move to reestablish a unified exchange rate. The official rate and the commercial rate were merged at L.E. 0.70 = $1. This rate was to apply to most official private and public transactions. Another rate of L.E. 0.39 = $1 was to apply to transactions under bilateral payments agreements with non-member countries of the IMF. In addition to the official and commercial markets, the free market continued to function for private dealings of foreign currencies between residents. In August 1981, a new commercial bank rate was created at L.E. 0.85 = $1, while the official rate remained unchanged.

From 1981 to 1991, the foreign exchange market in Egypt was fragmented into three pools; the Central Bank pool, the commercial banks pool, and the free market pool.

The Central Bank pool handled exports of petroleum, cotton, Suez Canal dues, and pipeline revenues. The proceeds were used to import key commodities, mostly food, and to finance government external debt ser-

vice. The exchange rate which applied to most transactions through this pool was fixed at L.E .70 = $1 for ten years 1979-1989. In July 1989, it was devalued to L.E 1.1 = $1, and another devaluation took place in July 1990 of L.E. 2 = $1 (C.B.E, 1992).

The commercial banks pool covers mainly workers remittances, tourism receipts, some exports, certain private sector imports, public sector imports, and capital transactions not assigned to the Central Bank pool. This commercial bank rate was set at L.E. 0.845 from 1981 until 1986 when it was replaced by a premium rate around L.E. 1.35 = $1.

In May 1987, following agreement with the IMF, a new procedure for determining this rate was introduced. A committee was formed to meet daily after the end of transactions in order to announce the buying and selling rates of foreign currency, taking into account market conditions and other factors. Under this new procedure, the rate ranged from L.E. 2.26 = $1 in May 1987 to L.E. 2.70 = $1 in mid-1990.

The free market pool shared common sources of supply with the commercial banks pool and supplied exchange for most visible and invisible transactions by the private sector. Rate setting in this market was used to respond generally to supply and demand and it was always at least as high as the commercial bank rate.

The 1987 reform measures discussed above were implemented in order to create an appropriate climate for attracting foreign exchange inflows, and to eliminate multiple rates and informal trade in foreign currencies. However, by the end of 1990, it became clear that these reform measures were adequate. Therefore, in February 1991, the Government replaced this system with a two-tier structure (National Bank of Egypt, 1991).

The new system consisted of two new entities. A new foreign exchange (secondary) market was created, where dealings were carried out through banks and other non-banking entities (exchange companies), and rates were set by market forces (resources included tourism, remittances, and free accounts). In addition, the former Central Bank pool was replaced by “primary markets”. This market was expected to supply the government with its needs for foreign exchange, including key imports and debt services. Supply sources included traditional sources, mainly Suez Canal tools, petroleum, cotton, foreign cash assistance and governmental loans, and sales by exporters of foreign exchange.

Primary market rates were supposed to be maintained within 5% of the average daily free market rate. The plan was to merge the primary market into the free market after one year (in February, 1992). However, total unification of the exchange rate market was achieved by the Egyptian government in October 1991. By the end of March 1991, the free market rate was at L.E. 3.32 = $ 1. After the unification of the foreign exchange market in October 1991, the rate was very close at L.E. 3.3 = $ 1.

The clear stability of the foreign exchange rate of the Egyptian pound is attributed to more than one factor. The most important is the huge difference in interest rates on Egyptian pound deposits and those for American dollars. Other factors include poor economic conditions and government regulations concerning exchange companies and speculation. However, some would attribute this stability to the government implementation of the economic reform program.

9. Exchange Rate Overvaluation

The exchange rate plays an important role in the allocation of resources among tradable and non-tradable, agricultural and non agricultural sectors. In fact, the exchange rate determines how much local currency an exporter receives in return for foreign currency earnings. An overvalued exchange rate means the exporter receives less local currency for exported crops than would otherwise be the case. Hence, an overvalued exchange rate in effect maintains artificially low producer prices, which is equivalent to imposing an implicit export tax.

One measure of exchange rate overvaluation is exchange rate bias. Two methods are commonly used to account for exchange rate bias. The most common method is to adjust the official exchange rate to reflect the differential inflation rate between domestic and import prices. The second method is to calculate a shadow or equilibrium exchange rate. However, this study uses a simpler approach. This approach is to mea-

sure exchange rate bias as the ratio of official exchange rate to black market exchange rate. Although black market rates may reflect a risk premium on the exchange owing to the illegal nature of the transaction, they produce results similar to those obtained using an equilibrium exchange rate (Taylor and Phillips, 1991). *Table 3-12* shows exchange rate bias as a measure of exchange rate overvaluation.

From 1970 to 1990, the Egyptian pound was consistently overvalued relative to the dollar. The nominal exchange rate adjustment in 1979 apparently reduced exchange rate overvaluation. With an annual inflation rate above 20%, a massive trade deficit, and rapid terms of trade deterioration, this foreign exchange bias increased rapidly during the following years and achieved its highest level in 1988. Exchange rate overvaluation declined in 1989 and in 1990, as a result of adjusting the official exchange rate.

In Egypt, agricultural exports and imports were valued at the official (Central Bank) rate from 1970 to 1990. Dethier (1987) explains the effect of this policy: "By valuing tradable goods at an overvalued nominal exchange rate, the government has artificially cheapened wheat imports, thus saving on foreign exchange reserves and raising demand for wheat and bread. By not paying exporters the 'opportunity cost' of their product, it has also accentuated the taxation of the sector and contributed to its declining performance".

10. International Trade

Egypt's foreign trade deficit has persisted since before World War II. The import bill rose rapidly during the 1970s. In 1975, the trade deficit exceeded US$ 2.3 billion. For the next two years, a growing net contribution from oil narrowed the trade deficit, but between 1977 and 1983 the trade deficit rose to over $ 4.5 billion. As conditions of the oil market changed and prices declined below $10 in 1986, Egypt's high level of imports could not be maintained. A severe shortage of foreign exchange and huge external debt created constraints. Even so, in 1989, Egypt's trade deficit deteriorated substantially and exports failed to lessen the trade deficit *(Tables 3-13 and 3-14)*.

11. External Debt

Egypt is among the world's most heavily indebted nations. Debt data for 1989 put total public and publicly guaranteed medium- and long-term debt at US$ 40 billion; private non-guaranteed debt at US$ 1.1 billion; and short-term debt at US$ 7.8 billion *(Table 3-15)*.

The total external debt at US$ 49 billion corresponded to 159% of Egypt's GNP in 1989 *(Table 3-16)*. Total debt service during 1989 exceeded 20% of exports of goods and services (World Bank, 1991). Regarding payments of both interest and capital on foreign debts, Egypt started to accumulate arrears as early as 1980. This led finally to a rescheduling in May 1987 of some US$ 6.5 billion owed to 17 OECD creditors.

To help Egypt face the huge costs related to the 1991 Gulf War, a number of creditor nations extended debt relief. Arab creditors have written off about US$ 7 billion, and the USA has forgiven about US$ 6.7 billion of Egypt's debt, in addition to smaller amounts which have also been written off by other western creditors (USER, 1991). Furthermore, an agreement was reached with the Paris Club for gradual reductions over three years (15%, 15%, 20%) in Egypt's external debts, and rescheduling of the rest, provided that Egypt continues to implement an agreed-upon economic reform program (Shaffee, 1992). Even after all these positive developments, one could argue that the external debt problem will continue to be of great concern to Egyptian policy-makers in the foreseeable future.

12. Distribution of Household Expenditures

Table 3-17 presents information derived from two household budget surveys that were conducted in Egypt during 1974-1975 and 1981-1982.

The distribution of income that can be derived from the latest household expenditure survey in Egypt (1981/82) reveals that in rural areas the richest 20% of households receive 44% of total income while the poorest 20% get only six%. In urban areas, the proportions are 40% and 7.5% of total income, respectively.

Thus, the degree of inequality is relatively less in the cities than in the countryside. Moreover, as indicated by the Gini coefficient, the degree of inequality declined between 1974 and 1982. However, one should

take into consideration the fact that estimates of income distribution based on expenditure data are bound to understate the real degree of inequality as the share of total savings in total income increases with the level of income (World Bank, 1990).

13. Expenditure Patterns

Table 3-18 presents household expenditures by expenditure quartile. The data in this table shows that in both rural and urban areas most families reported spending over half their total expenditure on food, with people in rural areas, who are generally poorer, spending a greater percentage on food than those in urban areas. The relatively high budget shares allotted to food reflects in part the low cost of rent and utilities. Fuels were heavily subsidized and rents were fixed.

The most important commodity group with a share of about 30% of total expenditure on food is the meat, fish and eggs group. This relatively high share reflects the high price the Egyptian consumer has to pay to obtain these products. During most of the 1970s and 1980s, livestock product prices were not controlled by the government. *Table 3-19* shows the relative importance of major food items in household food expenditures in both urban and rural areas.

14. Per Capita Consumption Trends of Major Food Commodities, 1970-1988

Time series information from the United Nation's Food and Agriculture organization (FAO) on the supply utilization of certain food items and population estimates as reported in the World Bank publications were used to calculate per capita consumption of major food commodities in Egypt from 1970 to 1988, *Table 3-20*.

Consumption of fish, sugar, starchy roots, meat, wheat, and eggs has increased steadily during the period, reflecting (in most cases) high income elasticities of demand. The per capita consumption of fish growth rate (5.7%) was the highest among food commodities in Egypt. The demand for sugar has been growing at an average annual rate of 5.1%. Per capita sugar consumption reached about 34.8 kilograms in 1985, up from 15.8 kilograms in 1970.

Although per capita consumption of meat in 1970 was only 11.5 kilograms, by 1985 it had increased to about 20 kilograms. Per capita consumption of wheat, with an average annual growth rate of 3.1%, increased from 94 kilograms in 1970 to more than 145 kilograms in 1988. Growing wheat imports supplied the greater part of the increase *(Figure 1)*.

Maize bread was usually consumed in rural areas, but due to increased availability of imported wheat at subsidized prices, maize consumption per capita was (almost) stagnant during this period. Rice consumption per capita increased during the 1970s, but declined during the next decade. These developments can be explained by the fact that rice production was stagnant during most of the period, and imports were not allowed in any significant amount. Consumption needs were met at the expense of decreasing exports.

Table 3-20 shows that per capita consumption of pulses decreased from 1970 to 1988. Traditionally, pulses—broad beans and lentils—have played a major part in the Egyptian diet and are an important source of protein. It is clear that increasing consumption of other staple commodities displaced pulses.

15. Government Intervention in Food Distribution

The Egyptian government has a long history of intervention in food distribution. The current system has its origins in World War II, when food shortages forced the government to adopt a food rationing program. And, in the second half of the 1960s, rising domestic prices, a straining economy, and a sharp drop in the availability of food aid led the government to issue rationing cards for oil, sugar, tea, and kerosene. Other subsidized items were made available without strict rations.

Over time, subsidies became applicable to a large number of food and non-food products, and a complex system of price controls, compulsory procurement of food and non-food farm products, rationing, and controlled distribution through government outlets has developed. A huge administrative apparatus has emerged to handle the various types of subsidies, including specialized trading agencies, stabilization funds, a government-controlled distribution network and a Ministry of Supply and Internal Trade.

16. Principal Commodities Subsidized

By the early 1980s, three types of products were subsidized or rationed:

1. Wheat flour and bread were sold at a fixed price, uniform throughout the country in unlimited quantities.
2. Sugar, tea, cooking oil, rice, beans, and lentils were sold at subsidized prices and were rationed in fixed monthly quotas, which vary according to governorate and to the rural or urban location of household;
3. Meat, poultry, and frozen fish were also subsidized, but in limited quantities (Alderman et al., 1982).

The General Authority for Supply Commodities (GASC), acting as an agent for the Ministry of Supply in the international market, imports most subsidized commodities. GASC's responsibility ends at port, and deliveries to storage companies occur at subsidized prices.

The Principal Bank of Development and Agricultural Credit (PBDAC) is the second largest purchaser of subsidized items. The PBDAC receives rice, beans, lentils, and wheat from domestic producers. The PBDAC also receives maize and beans from the GASC for distribution to consumers and industrial users.

17. Economic Costs of Food Subsidies

The overall magnitude of the food subsidy burden is presented in *Table 3-21*. After rising steeply from L.E. 41.8 million in 1970/71 to a peak of L.E. 2,055 million 1983/84, budgetary outlays for food subsidies declined. However, even in 1989/90 at L.E. 1,747.4 million food subsidies constituted about 5% of total government expenditure *(Figure 2)*.

Funds allocated for wheat and flour subsidies were the most significant among food subsidies during the 1970s and most of the 1980s. However, in 1989/90, the largest share of food subsidies was spent on sugar *(Figure 3)*.

18. Changes in the Food Subsidy System

In January 1977, the Egyptian government announced price increases for most subsidized and rationed commodities, with the intention of saving about 35% of the 1977 subsidy budget. However, following disturbances in the streets of Cairo and other cities, all price rises were rescinded. An inter-ministerial committee was established in 1979 to investigate means of achieving the goal of reducing the burden of and eventually eliminating, all subsidies. Two modifications were introduced in early 1980: ration cards were reissued with a slight reduction in eligibility and nominal market prices for bread and flour were raised.

When the ration cards were reissued, the Ministry of Supply records indicated 300,000 fewer families had ration cards in 1980 than 1979 (a reduction of 3.7%). Consumers were first given the choice between a cheap *baladi* (peasant) bread of reduced quality and a more expensive loaf of higher quality. Eventually the lower quality bread was removed from the market.

In 1983, the Ministry of Supply introduced two types of ration cards, the first one, a green card, entitles holders to receive rations at full subsidized prices. The second type, a red card, entitles holders to obtain their rationed supplies at partially subsidized prices. Partially subsidized rations were restricted to certain groups of households believed to belong to high income brackets.

Bread prices had been frozen for a long time when the decision was reached to double the price of bread to two piasters per small loaf in September 1984; the replacement of the old loaf with the higher-priced new loaf took place over an eighteen month period. The price of flour was also raised in September 1984 (Carr, 1990).

The government adopted several measures in an attempt to reduce the cost of the ration/food subsidy program in Egypt. The cost containment measures have involved three components: raising ration/subsidy prices, reducing the number of items included, and reducing the quantities subsidized.

Table 3-22 presents recent data on the prices of rationed/subsidized and open market commodities. The price of many ration and cooperative foods have increased. In addition, the *baladi* bread price increased by

150% between January and June 1989. In 1989 also, the government reduced the weight of the *baladi* loaf from 160 grams to 130 grams. As a result of this decision, the effective price per calorie purchased by the household increased from 0.003 piasters to 0.009 piasters, meaning the cost more than tripled.

Recent studies of the food subsidy system have shown that it has been effective in protecting the food security of the majority of the population.

Table 3-23 shows calorie supply per capita in Egypt and some other groups of countries from 1969 to 1988. The data indicate that from 1969 onward, food availability per capita increased steadily in Egypt with caloric availability reaching 3,196 calories per capita in 1986-1988. In comparing food availability in Egypt to other countries, one finds that the levels of consumption in Egypt are superior to most other countries with the exception of advanced countries.

19. Agricultural Product Prices

Fixed producer prices and procurement of crops are important policy instruments for the Egyptian government. Minister of Agriculture Wally (1982) noted that the Ministry (at that time) classified crops into four pricing groups:

1. In the first group, prices are set and farmers are obliged to deliver all their products to government. This applies to cotton and sugar cane.

2. In the second group, prices are set for a quota of production that farmers are obliged to deliver to pooling centers. The balance of the crop is marketed freely. Examples are rice, sesame and ground nuts.

3. The third group includes crops the prices of which the government indirectly determines since it controls imports and consequently affects domestic prices. Wheat and maize are examples.

4. The fourth group includes commodities whose pricing is determined in general by forces of supply and demand. Examples are vegetables, fruits, meat dairy products, eggs, fish and berseem.

According to Nassar and Mansour (1987), the government priced the commodities it bought based on its estimates of production costs. But the data on yearly increases in costs of production and government prices show that even at distorted prices, increases in costs outpaced price increases. This confirms that the government has not taken the cost of production approach as a strict guideline. In fact, the government has not followed that approach rigorously since the early 1970s, when it decided to increase prices to farmers to reduce the gap between domestic and international prices.

Another turning point is the price policy reform of 1987 and government relaxation of its control over most crops and agricultural products in the late 1980s and early 1990s. During this period, the exception of cotton and sugar cane most crop prices increased sharply. Some observers call this period “the agricultural price revolution” (Sadowski, 1991). Between 1987 and 1990, nominal farmgate prices increased by 130%, 78%, 115%, 68, and 71% for cotton, rice, wheat, maize, and sugarcane, respectively.

20. Agricultural Input Subsidies

Input subsidies are often introduced to encourage adoption of modern technology, stabilize prices and income, reduce risks and favor smaller over large farmers. These objectives have all been of some importance in Egypt in the past. However, in recent years the main objective of input subsidy policy has been to offset low prices paid to producers for controlled crops.

The period under study (1970-1990) has witnessed drastic expansion of the total value of direct input subsidies. The total nominal value of agricultural input subsidies was at its lowest level in 1970/71, and it increased to reach a high level in 1984/85. A decreasing trend can be identified after 1985 although its highest level was in 1989/90. The four most important agricultural subsidies are on fertilizer, credit, cotton pest control, and yellow corn. Other input subsidies include sugarcane irrigation, extension services, and pest control for crops other than cotton. This section presents a discussion of the most important agricultural input subsidies excluding credit, which is the subject of another section in this study.

21. Fertilizer Subsidies

Both the manufacture of domestically produced fertilizer and the distribution of all fertilizers are subsidized. Fertilizer subsidies are paid by the General Authority for Agricultural Stabilization Fund (GAASF), which transfers funds obtained from the Ministry of Finance to fertilizer factories and PBDAC. Payments to domestic factories cover production costs per ton in excess of the ex-factory price paid by PBDAC. Payments to PBDAC cover handling and distribution costs on imported and domestic fertilizer over the margin between PBDAC buying and selling prices.

Total nominal fertilizer subsidies were quite variable from 1970 to 1990 *(Table 3-25)*. Their highest value was in 1989/90 and their lowest in 1970/71. In general, the 1980s have seen higher fertilizer subsidies than the 1970s.

22. Subsidies on Cotton Pest Control

Pesticides are the next most important input with respect to subsidies. All pesticides are imported and the vast majority are used on cotton. Cotton producers are subsidized with respect to the cost of chemical materials and also the costs of their application. Subsidy to cotton farmers was calculated as the per feddan costs for imports, distribution, and application of chemicals less the costs paid by farmers. Total cotton pest control subsidies have increased for most of the period *(Table 3-25)*.

23. Yellow Corn Subsidies

Subsidies on imported yellow corn were used to cover the difference between import and distribution costs per ton, and prices at which maize (yellow corn) was sold to users as livestock feed. These subsidies were at their highest level of 241 million L.E. in 1984/85. Following that year maize subsidies fell drastically, and by 1987/88 only 6.8 million L.E. were allocated for this input subsidy. In 1988/89, livestock and poultry producers were facing domestic prices for yellow corn close to world prices. It is estimated that the Egyptian government made a profit of about 11 million L.E. from imported yellow corn in 1988/89 (Rizq, 1992).

Minor input subsidies paid for by the GAASF are each quite modest, and in the aggregate represent only a small percentage of overall input subsidies. However, one should take into account the fact that the GAASE is not the only agency in the Egyptian government that provides subsidies for agricultural inputs. One general subsidy provided to all Egyptian farmers is on irrigation water. This very significant subsidy is not included in the GAASF budget. Similarly, public investments in irrigation, drainage, and other infrastructure can be considered as another subsidy, but is not included in this section.

24. Agricultural Taxation

During the last three decades, most developing countries resorted to transferring resources out of the farming sector through taxation to finance industrialization, infrastructure, and human welfare programs. Different types of taxation were used such as explicit taxation, i.e., taxing farmer's land or incomes and implicit taxation, i.e., via price policies or exchange rate policies.

Explicit taxes on Egyptian agriculture are only marginal. A land tax is levied on all arable land on the basis of the annual rental value of the land. Between 1953 and 1973 taxable land owners whose tax liability did not exceed L.E. 4 were exempt. After 1973, properties of less than three feddans became exempt (Von Braun et al., 1983). During the 1980s, the land tax contributed less than 1.5% of total tax revenues *(Table 3-26)*.

Several much more common, and more distorting means of taxing agriculture are implicit including state-controlled marketing agencies (parastatals) enjoying monopsony, overvalued exchange rate, and other trade policy instruments such as tariffs and quotas. Both types of policies weaken farmer incentives. Direct government intervention in agricultural prices and offering farmers prices lower than international prices weaken their incentive to produce. And, because some crops are more heavily taxed than others, farmers reallocate land, labor and other inputs toward less taxed, more profitable crops.

Exchange rate overvaluation policies result in lower values for exports and higher values for imports. Thus, it hurts producers of export crops (e.g., cotton, rice, vegetables) and of the major import competing crop, cereals. Furthermore, these policies lead to an increase in the relative price of non-traded to traded goods. Because a large portion of the sector's costs are non-traded inputs like land and labor, even though their outputs are traded, these policies reduce farmers profit margin and weaken their incentive to produce.

The simplest measure of price distortion is the nominal protection coefficient (NPC). The nominal protection coefficient of a commodity is the ratio of its domestic price to its border price. The border price is defined as the price in the international market converted into local currency using an exchange rate. The NPC can assume a range of numerical values.

If NPC > 1, domestic producers are receiving a higher price after intervention than they would without intervention.

If NPC < 1, then the producer is discriminated against. Finally,

If NPC = 1, the structure of protection is neutral.

In summary, the greater the divergence of the NPC from unity, the greater the effect of policy on altering price structures and the incentives to produce the product. NPCs are summary indicators of the relative incentive structure generated by policy across crops and across years.

The border price must also be adjusted for over- or under-valuation of the domestic currency. If only the official rate was used, the extent of protection would be over- or under-estimated because the exchange rate at which foreign prices are converted into domestic prices alters the price of the commodity. NPCs adjusted for the extent of over- or under-valuation are referred to as net NPCs, while an unadjusted NPCs are often referred to as gross NPCs. The importance of the exchange rate policy as a source of price incentive or disincentive is emphasized in comparisons of gross and net NPCs (Tsakok, 1990).

For the purpose of this study, two sets of NPCs were computed. The first set, gross NPCs, uses the official exchange rate and represents the magnitude of direct intervention in domestic price determination by measuring the extent to which domestic prices deviate from the border prices facing the country. *Table 3-27* shows the gross nominal protection coefficient for five major crops (wheat, rice, maize, sugarcane and cotton) from 1970 to 1990.

Indirect interventions brought about by exchange rate policies were measured by an adjusted NPC (net NPC), which took into account biased official exchange rates. *Table 3-28* shows net NPCs for wheat, rice, maize, sugarcane and cotton from 1970 to 1990.

A comparison of the results contained in *Table 3-27* with those contained in *Table 3-28* and *Figures 4, 5, 6, 7*, provides strong evidence that indirect price discrimination owing to distorted exchange rate policies exacerbates taxation caused by direct pricing policies. All crops were taxed from 1970-1990. Cotton was most heavily taxed, while wheat and other crops were taxed to a much lesser extent. As a result of this pattern of taxation, farmers have moved away from cotton to less-regulated crops, such as vegetables, fruits and berseem (see The Egyptian Cotton Problem, section II, page 16).

IV – Policy Reform

1. Need For Policy Reform

In the early 1990s, as discussed in previous chapters, Egypt experienced a significant decline in its major sources of foreign exchange, i.e., oil revenue, Suez Canal earnings, and remittances from Egyptians working in the Gulf states. Falling foreign earnings, coupled with rising debt service obligations, have created severe pressures on the country's fiscal balance, international payments and economic growth performance.

The current account deficit grew to a peak of US$ 2.1 billion in 1985, about 4.7% of GDP. External debt increased rapidly reaching US$ 49 billion or about 154% of GDP by the end of 1989. The budget deficit

remained above 20% of GDP for most of the 1980s. Since 1986, real GDP growth has been less than 3% a year, investment has dropped sharply, inflation has been running at over 20% a year, and per capita national income and consumption declined in real terms. During the past few years, the government responded to the deteriorating economic situation with a series of corrective policy measures.

A standby agreement was signed with the International Monetary Fund in 1987. Main measures included in this agreement were:

1. the government freed the Commercial bank exchange rate;
2. lending rates were raised;
3. electricity and fuel prices were raised by an average of 30%;
4. managers of public sector industries were accorded powers to decide on reinvestment of profits;
5. controls were lifted from all crops except cotton, sugarcane, and rice; and;
6. a budget deficit target of 10% of GDP was set.

As part of the agricultural sector and exchange rate reform, the government did not complete the agreed macro, trade, and industrial reform package. In fact, the agreement was effectively suspended in mid-1988. However, during the following years the government recognized that fundamental reforms were necessary to deal with Egypt's economic problems. Thus, by mid-1991, continued discussion with the IMF and the World Bank produced a wide-ranging program of economic reform.

2. Economic Reform Program of 1991

The main objective of the Egyptian economic reform program of 1991, as spelled out by the government in a recent official statement delivered to the people's assembly on December 28, 1992 (1992) is deregulation of the Egyptian economy in all its aspects and opening up to market forces. The reform program consists of two major components: stabilization policies and structural adjustment policies.

Stabilization policies, designed in consultation with the IMF, are oriented to reductions in expenditures to bring about an adjustment of domestic demand to the reduced level of external resources to correct inflationary fiscal and monetary policies and allow interest rates and exchange rates to respond to market forces.

The program of structural adjustment planned in collaboration with the World Bank and USAID is designed to improve the conditions of supply; correct distortions in economic policies; improve allocation of domestic resources; and produce institutional transformations which help reduce the vulnerability to external shocks in the future. The Structural Adjustment program (SAP) is supported by a World Bank Structural Adjustment Loan (SAL) approved in 1991 in the amount of US$ 300 million. Moreover, a standby arrangement with the IMF, equivalent to SDR 278 million, was approved in the same year. The SAP is also supported by the African Development Bank and others.

3. Stabilization Policies

In January 1991, broad interest rate and credit reforms were implemented. Deposit and lending rates increased with a noticeable positive impact on domestic savings. At the same time, a treasury bill was issued to allow the government to obtain short-term funds, replacing inflationary Central Bank financing. Reserve requirements on local currency deposits have been reduced and liquidity ratios eased.

In October 1991, the government announced the liberalization of the foreign exchange market. Private foreign exchange dealers had to be licensed in order to operate.

Implementing credit and monetary reform measures resulted in some positive effects:

1. the Egyptian pound exchange rate was stable during the two-year period following liberalization;
2. the last year (1992) showed a decreasing trend in interest rates;
3. the foreign exchange supply increased.

Furthermore, the government initiated a series of fiscal policy changes to control and reduce its budget deficit:

1. a national sales tax was introduced in May 1991 to raise additional revenues;
2. the government undertook a major reform of custom duties;
3. a set of measures to improve tax administration was implemented;
4. the subsidy bill was reduced. Fiscal reform measures led to reducing the government budget deficit from 24.7% of GDP in 1987/88 to 7.1% of GDP in 1991/92.

In 1991, Arab Creditors and the USA wrote off about US$ 7 billion and US$ 6.7 billion in Egypt's debt, respectively. Moreover, an agreement was reached with the Paris Club for gradual reductions over three stages (15%, 15%, 20%) for Egypt's external debts. According to this agreement and during the fiscal year 1991/92, Egypt's external debt was reduced by 15%. The second reduction of 15% is expected to be announced in 1993 after reaching an agreement with the IMF. The current account of the balance of payments was positive in 1990/91 and 1991/92. Gradual reduction in the inflation rate has been one of the important objectives of the economic reform program. Among measures used to control inflation are reducing the budget deficit; financing the budget deficit with real savings; restraining demand for credit; reducing the growth rate in money supply from 24.2% in 1990/91 to 13.9% in 1991/92. The end result of these measures was a reduction in the inflation rate from 20.7% of June, 1991 to 9.7% at the end of June, 1992.

4. Structural Adjustment Policies

The structural adjustment program consists of five components: Price reform measures; private sector reforms; foreign trade liberalization; public sector reforms; and the Social Fund.

The objective of price reform is to promote a structure of domestic relative prices that reflects opportunity costs. Between 1986 and 1990, the government increased electricity tariffs by about 250% and tripled the price of fuel oil. The government aims to reach international prices for petroleum products and long run marginal costs for electricity by 1995. Subsidies for transport and telecommunication services have been reduced, and the goal is to reach full-cost prices by the mid-1990s (World Bank, 1990). By the end of 1992, the government had decontrolled prices of most industrial and agricultural commodities.

The adjustment program includes actions to encourage private sector expansion, including abolition of investment controls and licensing procedures and reduction of discrimination against the private sector. The government implemented a "Negative List" for investment in April, 1991. Automatic approval is assured for projects not on the list.

During 1989, in accordance with a plan agreed upon with the World Bank, the government began to take some significant steps toward foreign trade liberalization. Measures were announced for the phase-out of most non-tariff barriers to imports and exports. In May 1991, a new import-export code was adopted to help in eliminating restrictions on import-export activities and to make both private and public sector firms involved in foreign trade subject to the same set of rules and regulations. Most tariff exemptions were abolished, and most export restrictions were eliminated.

The government has implemented measures to liberalize the policy environment within which public enterprises operate. In 1991, the public sector company law was approved by the People's Assembly. This law, through the establishment of diversified holding companies, gives public-sector firms more autonomy and makes managers accountable for efficient and profitable operations.

The Social Fund is a special institution that was established in 1991 to assist low-income groups who are the most vulnerable to economic dislocations accompanying reforms. The fund provides financial support to retraining and adjustment services to facilitate the reemployment of displaced workers. It also supports labor-intensive public work projects in poor communities (World Bank, 1990). One of the principal functions of the Social Fund is to mobilize international and local financial resources. The total amount of grants and loans available for financing the Social Fund activities in 1992 was US$ 612 million (*Al-Ahram* Newspaper, 1992).

5. Agricultural Policy Reforms

The Agricultural Policy Reform Program effectively began in 1986 in the context of the USAID-financed Agricultural Credit and Production Project and the self-help measures of the PL-480 Title I agreements, and continues to the present (1993).

The major components of the agricultural policy reform program are as follows:

1. remove government farm price controls;
2. remove government crop area controls;
3. remove government crop procurement quotas;
4. remove government constraints on private sector processing and marketing of farm products and inputs;
5. eliminate subsidies in farm inputs.

Specific actions in support of these objectives have been developed in a multi-year program. By December 1992, area and production quotas and marketing restrictions on all crops had been eliminated, with the exception of cotton and sugarcane. Liberalization of the cotton and sugarcane markets is expected in November 1993 and November 1994, respectively. The Cotton procurement price was increased to 66% of world price in 1992. Control of private and public sector farm product processing and marketing firms had been removed. The exchange rate subsidy for imported inputs was eliminated in 1991. All other input subsidies have been reduced and will be eliminated by 1993. Public ownership of newly reclaimed land was prohibited with all such land allotted to private individuals and companies.

Thus, by the end of 1992, substantial progress was made on the reform of agricultural policy. Only cotton and sugarcane remained under some government controls, and steps are being implemented to achieve complete liberalization of these two crops in the next two years (1993).

Summary

In mid-1990, Egypt's population was estimated to be 55.6 million. Urban population is 44% of total population. A high proportion of Egypt's population is below 15 years of age. In Egypt, the agricultural sector is dependant on the Nile for irrigation; other sources include rain water and underground water.

The standard of living in Egypt as measured by quantifiable social and economic indicators has improved markedly in the last two decades. Food intake, education, and health standards are higher today than ever. Food availability in Egypt far exceeds the average availability for developing countries.

In chapter two, a detailed picture of the Egyptian agricultural sector was presented. In the early 1970s, agriculture contributed about 28% to GDP but employed about 53% of the work force. By the end of the 1980s, agriculture's contribution to GDP declined to only 17% and its share of total employment dropped by nearly one third.

Agricultural employment declined from 4.9 million jobs in 1976 to 4.6 million in 1986. Agriculture share in total employment fell from 48% to 38% during the same period. Real wages for agricultural labor increased from 1970 to 1985, then declined. As a result of these developments, machines were substituted for labor, and labor share in total cost increased. The highest rate of growth in labor productivity was from 1966/67 to 1973, which can be explained by high levels of investment in agricultural infrastructure during the 1960s.

Agricultural growth was low (only 2.7% from 1965-1980) and declined to 2.5% during 1980-1990. Agriculture's share of all goods exported declined from 75 in 1970 to 15% in 1989. Self-sufficiency ratios for most food commodities declined during the 1970s and 1980s.

The total area of Egypt is about 245 million feddans (1 feddan = 1.038 acre). Total agricultural land is approximately 7.4 million feddans or 3% of the total area of Egypt. Agricultural land per capita decreased from 0.4 feddans in 1927 to only 0.13 feddans per capita in 1990.

Major shifts took place in the cropping pattern from 1970 to 1990. Area devoted to cotton declined from 1.6 million feddans in 1970 to less than 1 million feddans in 1990. At the same time, maize, fruits and vegetables areas increased.

From 1967 to 1990, land productivity per feddan several crops increased by a factor of 36% for rice, 59% for maize, and up to 79% for wheat. Most of these yield improvements took place during the last few years. Cotton yield declined during the 1980s, with the area devoted to cotton declining.

Egypt has the oldest railway system in the region. Reasonable roads connect Cairo with Alexandria, Suez, delta towns, and Aswan. Egypt has 15 airports, the largest being Cairo International Airport.

The Agricultural Research Center (ARC) constitutes the biggest research apparatus of any kind in Egypt. It comprises 14 institutes and four central laboratories. Egypt has not had difficulty in training enough qualified staff for scientific research. The recent significant improvements in rice yields are in large part due to a comprehensive research and extension program to develop and introduce high yielding varieties.

A careful look showed that the scope of public sector involvement in agricultural marketing and distribution is very extensive. The General Authority for Supply Commodities (GASC) both purchased locally-produced crops and imported many food items. The Principal Bank for Development and Agricultural Credit (PBDAC) controlled by the Ministry of Agriculture and Land Reclamation, is the most important parastatal in Egyptian agriculture. PBDAC acts as a holding company with 17 affiliated governorate banks which together operate a network of some 750 village banks. PBDAC distributes most basic agricultural inputs to farmers; provides services as a marketing agency for selected crops; and supplies and controls credit.

Economic performance indicators were the subject of discussion in section III, page 23. Egypt achieved a very high GDP growth rate of eight to 9% in real terms during the second half of the 1970s. Oil exports, remittances, Suez Canal earnings, and tourism financed this growth. In the early 1980s, foreign exchange earnings dropped, and as a result, economic growth fell sharply. Since 1986, real GDP growth has been less than 3% a year, investment has dropped sharply, per capita national income and consumption declined in real terms, and external indebtedness grew to about 154% of GDP in 1989.

The Egyptian economy's rapid deterioration during the latter half of the 1980s was not due only to declining foreign exchange earnings, however. Inflated public spending in the 1970s and early 1980s created large budget deficits, intensified inflationary pressures, and undermined the balance of payments. Moreover, the use of foreign loans to finance the current account deficit increased external debts. Finally, the pervasive systems of price control, distorted allocation of resources, overvalued exchange rate, and the lack of proper incentives prevented the development of a large diversified export sector and contributed to economic stagnation and decline in Egypt in the 1980s.

Government investment in agriculture and irrigation has been very modest during the last two decades. The share of agriculture and irrigation in total public investment fell from about 23% in the mid-1960s to about 8% in the mid-1970s, then increased to 9% in recent years. Therefore, compared to other sectors, agriculture has shown the slowest growth with an average increase of about 2.7% per year and 2.5% per year, between 1965 and 1980, and 1980 and 1990, respectively.

The public deficit rose from 6% of GDP in 1971 to a high of 31% in 1975. During most of the 1980s, the deficit exceeded 20% of GDP. These deficits were the result of various factors: declining revenues from oil exports during the 1980s; the increasing gap between public sector savings and its investment expenditures; growth in consumer subsidies particularly for food; and from 1970 to 1990, most of the additional labor force was hired by the government itself, with the expected result of over-staffing of government agencies and increasing budget deficit.

Moreover, the large reliance on bank financing caused inflationary pressures in the economy: the inflation rate was close to 20% for most of the 1980s according to the official CPI. The Egyptian government was in control of all deposits and lending rates throughout the period 1970-1990. With the exception of the early 1970s, interest rates have been significantly negative in real terms. These low interest rates discouraged savers from depositing their savings in banks and directed savings into real estate. In 1991, new interest rates and credit reform measures were introduced by the Egyptian Central Bank. Among these measures were abolition of ceilings on deposit and lending rates and introduction of a treasury bill auction to support a system of market-based interest rates.

From the end of 1970 to the end of 1980, the domestic money supply (M2) grew from L.E. 1.08 billion to L.E. 10.4 billion. By the end of 1980s, the money supply had increased to L.E. 82.5 billion. Financing the large and increasing government budget deficit was the force behind this increase in money supply.

The exchange rate plays an important role in the allocation of resources among tradable and non-tradable, agricultural and non agricultural sectors. From 1970 to 1990, the Egyptian pound was consistently overvalued relative to the dollar exchange rate. The nominal exchange rate adjustment in 1979 reduced the exchange rate overvaluation. An annual inflation rate above 20%, a massive trade deficit, and rapid terms of trade deterioration caused exchange rate overvaluation to increase during the following years and achieve its highest level in 1988. Exchange rate overvaluation declined in 1989 and also in 1990 as a result of adjustment in the official exchange rate.

Egypt's foreign trade balance was in deficit from 1970-1990. Revenue from oil exports increased during the 1970s, but the Egyptian import bill rose rapidly during the same period. Consequently, trade deficit increased from 2.3 billion dollars in 1975 to 4.5 billion dollar in 1983. During the 1980s, Egypt's trade deficit deteriorated substantially and exports failed to narrow the trade deficit.

Egypt's total external debt was about US$ 49 billion or 159% of GNP in 1989. Total debt service during 1989 exceeded 20% of exports of goods and services. In 1991, Arab creditors, the USA, and some other western nations extended debt relief. Moreover, an agreement was reached with the Paris Club for gradual reductions over three years in Egypt's external debts, and rescheduling of the rest, provided that Egypt continues to implement an agreed-upon economic reform program.

In both rural and urban areas most families reported spending over half of their total expenditures on food, with people in rural areas spending a greater percentage on food than those in urban areas.

Per capita consumption of fish, sugar, starchy roots, meat, wheat, and eggs increased steadily from 1970 to 1988, reflecting higher income levels and high income elasticities of demand. Moreover, government subsidy programs encouraged higher levels of consumption.

The Egyptian government has a long history of intervention in food distribution. In the early 1980s, three types of products were subsidized or rationed:

1. wheat flour and bread were sold at a fixed price, uniform throughout the country in unlimited quantities;
2. sugar, tea, cooking oil, rice, beans, and lentils were sold at subsidized prices and were rationed in fixed monthly quotas;
3. meat, poultry, and frozen fish were also subsidized but in limited quantities.

Budgetary outlays for food subsidies constituted about 5% of total government expenditure in 1989/90. Wheat and flour subsidies were the most important among food subsidies during the 1960s and most of the 1980s. However, 1989/90 data show sugar with the largest share of food subsidies. In an attempt to reduce the cost of the ration/food subsidy program in Egypt the government adopted several major measures; raising ration/subsidy prices, reducing the number of items included, and reducing the quantities subsidized.

Fixed producer prices and procurement of crops were important policy instruments used by the Egyptian government from 1970 to 1990. These investments can be divided into four major groups. In the first group, cotton and sugarcane prices were set and farmers were obliged to deliver all their product to the government. In the second group, prices were set for a certain quota of production that farmers were obliged to deliver to the pooling centers. For the third group, prices were determined indirectly by the government through imports. Finally, prices of other commodities were determined by forces of supply and demand. Despite these policies, in the late 1980s and early 1990s, most crop prices increased sharply. Between 1987 and 1990, nominal farmgate prices increased by 130%, 78%, 115%, 68, and 71% for cotton, rice, wheat, maize and sugarcane, respectively.

The four most important agricultural subsidies were on fertilizer, credit, cotton pest control, and yellow corn. Other input subsidies included sugarcane irrigation, extension services, and pest control for crops other than cotton. Both the manufacture of domestically produced fertilizer and distribution of domestic and imported fertilizer were subsidized. Fertilizer subsidies were paid by the General Authority for Agricultural Stabilization Fund (GAASF). Pesticides were the next most important input with respect to subsidies. Yellow corn subsidies fell drastically after 1985, and it is even estimated that the Egyptian government made a profit from imported yellow corn in 1988/89.

Two government agencies were involved in food distribution. The General Authority for supply commodities (GASC) was responsible for importing most subsidized commodities; and the Principal Bank for Development and Agricultural Credit (PBDAC) was the second largest purchaser of subsidized items.

Different types of agricultural taxes were used in Egypt from 1970 to 1990. Explicit taxes (a land tax) contributed less than 1.5% of total tax revenue. However, much more distorting means of taxing agriculture were implicit. Parastatals offering prices to farmers that were lower than international prices was a form of implicit taxation. On the other hand, an overvalued exchange rate and other trade policy instruments leads to an increase in the relative price of non-traded to traded goods, and thus reduces farmers profit margins and weakens their incentive to produce.

The simplest measure of price distortion is the Nominal Protection Coefficient (NPC). For the purpose of this study, two sets of NPCs were computed. First, gross NPCs were computed using the official exchange rate for five major crops (cotton, rice, wheat, maize, and sugarcane). Second, indirect interventions brought about by exchange rate policies were measured by adjusted NPC which took into account biased official exchange rates. The results show that all major crops were taxed from 1970-1990. Moreover, a comparison of the gross with net NPCs indicated that indirect price discrimination owing to distorted exchange rate policies exacerbates taxation caused by direct pricing policies.

In mid-1991, the government adopted a wide-ranging program of economic reform, which resulted in some positive effects:

1. the exchange rate has been stable for two years;
2. foreign exchange supply has increased;
3. the Government budget deficit decreased to 7.1% of GDP in 1991/92;
4. Egypt's external debt was reduced;
5. the current account of the balance of payments was positive in 1990/91 and 1991/92;
6. the inflation rate was reduced from 20.7% at end of June 1991 to 9.7% at the end of June 1992.

Substantial progress has been made on the reform of agricultural policies. Only cotton and sugarcane remain under some government controls and total decontrolling of these two crops is expected in the following two years. All input subsidies have been reduced and will be eliminated by 1993. Control of private sector farm product processing and marketing firms has been removed.

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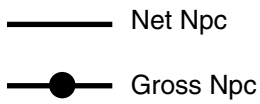

Figure 5. Direct and Indirect Intervention Effects on Maize (1970-1990)

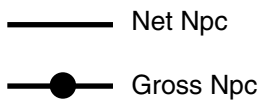

Figure 6. Direct and Indirect Intervention Effects on Rice (1970-1990)

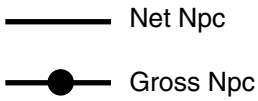

Figure 7. Direct and Indirect Intervention Effects on Wheat (1970-1990)