



Farming in Egypt was confined to less than 3 percent of the total land area, because the country falls within arid and hyperarid zones. About 90 percent of the agricultural area was concentrated in the Delta, and the rest fell within a narrow ribbon along the Nile between Aswan and Cairo (Upper Egypt) and a strip along the Mediterranean. The arable land was estimated by the United Nations Food and Agriculture Organization as being about 6.02 million feddans (1 feddan = 1.038 acres = .42 hectare) in 1987. This was the equivalent of about 0.12 feddan per capita, one of the lowest in the world, and less than Bangladesh's 0.19. The warm weather, plentiful water, and exceptionally fertile soil, however, enabled Egyptian farmers to practice double and multiple cropping, which effectively doubled the arable area (see table 7, Appendix). Nevertheless, the relative scarcity of arable land, coupled with, among other things, high population growth, made Egypt depend on external sources for about half of its food supply in the late 1980s.

In spite of Egypt's dependence on foreign food supplies and agriculture's generally poor performance over the 1980s, agriculture remained the key sector of the Egyptian economy and its future development. In 1988 it contributed more than 20 percent of GDP and about 9 percent of exports and employed more than 4 million workers, or about one-third of total employment. Its significance would be even more pronounced if account were taken of the industries from which it purchased, such as fertilizers and machinery, and those to which it sold, such as food processing and textiles.

Agricultural development responded to the ecology, state policy, technology, and shifts in the international political economy. In the early nineteenth century under Muhammad Ali, Egypt introduced long-staple cotton, which in 1990 remained a prized commodity on the world market, and initiated the long-term process of upgrading the irrigation system. The ecological conditions of the Nile Valley proved eminently suitable for cotton cultivation. Helped by a world cotton shortage arising from the American Civil War in the 1860s, Egyptian agriculture expanded rapidly. By the early 1900s, the situation had changed: additions to new arable land were slow and increasingly costly as the quality of land to be added became poorer, expansion of irrigation was not coupled with expanded drainage, and the intensive cultivation of cotton exhausted the soil and reduced its fertility. During the first half of the twentieth century, agricultural growth may have averaged less than 1 percent a year.

In addition to agriculture's declining growth rate, a social crisis ensued in the countryside, manifested in great inequalities and sporadic peasant rebellions. Reforming the conditions of agriculture fell after 1952 to the Free Officers. The new regime sought to carry out the task through extensive intervention in the sector to the point where the state was described as the silent partner; examination of state policy vis-à-vis agriculture is, therefore, a prerequisite for understanding the evolution of the sector. The state implemented land-reform programs, extended and altered the irrigation system, reclaimed new land, and regulated input and output prices as well as land use. Carrying out agricultural controls was entrusted to the rural cooperatives. The controls continued and were modified under Sadat and were gradually being relaxed under Mubarak. The results of state intervention were often mixed, both economically and socially.

The Food Gap

In 1960 Egypt was self-sufficient in almost all basic food commodities, with the exception of wheat, of which the country had a self-sufficiency ratio (domestic production in relation to consumption) of 70 percent. The self-sufficiency ratio declined dramatically for most products during the 1970s and 1980s, and economists began to speak of a serious food gap in Egypt (see table 8, Appendix). Food security, in the sense of adequate production and provision of food to consumers at relatively low prices, also became a linchpin of agricultural and development policies.

Food gap data were difficult to ascertain, especially because public-sector food imports often bypassed customs. By the end of the 1980s, the self-sufficiency ratio was only around 20 percent for wheat, lentils, and edible oil. The major basic staple for which Egypt did not rely on external supply sources was rice. The country also produced most of the poultry and eggs it consumed. On the whole, it imported more than one-half of the food consumed, and food imports made up about one-quarter of total imports. Meanwhile, agricultural exports, mainly cotton, were declining, and Egypt was transformed from a net agricultural exporter to a net importer (see Foreign Trade, this ch.). Most worrisome, both financially and politically, was the wheat gap: wheat was the basic staple of the Egyptian diet. Some of the external wheat supply came in the form of aid, especially from the United States, which donated about 10 percent to 20 percent of wheat consumed. But food aid was not a secure source because of the volatility of politics, and, in any case, the share of food aid dropped as the country's consumption grew.

Moreover, food subsidies to consumers imposed severe strains on the budget deficit. The debt-ridden government faced difficulties finding creditors to finance food imports, and rising world food commodity prices may have added as much as US\$600 million to wheat imports alone in 1989. Food shortages were reported in 1988 and 1989, including such basic items as tea, sugar, and oil.

The drop in food self-sufficiency was attributed, on the demand side, to the rising demand caused by high rates of population growth, the rapid rise of incomes in the 1970s, and subsidized prices, and, on the supply side, to the slow growth of agricultural yields. Egyptians consumed annually less than 110 kilograms per capita of wheat in 1960. In the 1980s, the wheat supply was enough to provide 175 to 200 kilograms per capita, compared with a world average of less than 60 to 75 kilograms per capita. Some of this went to chicken and cattle feed because the low prices made it economical for farmers and households to substitute wheat for other fodder.

The silver lining of this cloudy picture was the marked improvement in the average Egyptian diet. Daily food consumption increased from 2,307 calories per capita in the period 1961 to 1963, to 3,313 calories per capita from 1984 to 1986, and from 62.5 grams per capita of protein to 81.1 grams per capita over the same period. These averages put the Egyptian diet directly below that of developed countries. But not all segments of the population benefited to the same extent. For example, a sample survey of 6,300 urban and rural families in FY 1981 found that the daily per capita caloric intake was 1,500 for the lowest 17 percent and more than 3,500 for the highest 18 percent; the distribution of protein intake was even more skewed. A 1986 study done for the United Nations International Labour Organisation

recommended that, to avoid further deterioration of the diet of the poor, the prices of basic staples should not be raised.

Cropping Patterns, Production, and Yield

Sprinkler irrigation used on large farms and newly reclaimed areas
Courtesy Embassy of Egypt, Washington

Greenhouse growing pyrethrum, used for making insecticides, in As Salihyah
Courtesy Embassy of Egypt, Washington

Egyptian farmers grew a rich variety of crops, including grains, cotton, barsim (clover), legumes, fruits, and vegetables, thanks to the warm climate, plentiful water along the Nile, and exceptionally fertile soil. The country essentially has two seasons, summer and winter; spring and fall are quite short. The climatic differences between north and south have some impact on the geographical distribution of crops. For example, humidity in the Delta suits long-staple cotton. The drier, hotter climate of the south favors the planting of sugarcane, onions, and lentils. Variations in climate are not great, however, and major crops were grown in most of the climatic zones.

The single most important change in the cropping pattern in Egypt's modern history was the introduction of cotton during the reign of Muhammad Ali, because it led to the transformation of irrigation methods. Cotton requires a good deal of water in summer when the Nile water is low, and it must be harvested before the flood season. This necessitated the regulation of the Nile flow and brought about a shift from basin (flood) to perennial (roughly, on demand) irrigation (see Technology, this ch.).

Perennial irrigation not only made cotton growing possible, it also permitted double and even triple cropping on most of the arable land. Furthermore, it enabled farmers to switch the crop rotation from a three- to a two-year cycle. The original three-year cycle included clover and cotton in the first year, beans and fallow in the second, and wheat or barley and corn in the third. The two-year rotation consisted of clover or fallow followed by cotton, and the second year, crops of wheat or barley and beans followed by clover and corn. By 1890 about 40 percent of the land was put on a two-year rotation. The biennial rotation was believed to be harsh on the land, and the government tried to eliminate it under Nasser. In 1990 farmers resorted to both rotations flexibly.

Crop areas were regulated by the government according to manifold economic, technical, and social criteria. Comprehensive land use planning began only in 1966, and requirements were relaxed in 1974. But farmers responded to other imperatives as well, and the area occupied by various crops changed over time.

The major shift since 1952 was the significant reduction of the cotton area and the parallel increase in that of clover, horticulture, and rice. Originally, the government put a maximum limit on the cotton area to avoid excess production and lower prices on the world market; the

Egyptian supply of long-staple cotton affected world prices because of its large share. As the cotton area shrank, however, the government began to set minimum limits, because cotton was needed in order to obtain foreign exchange. Cheap cotton has represented an important source of foreign currency for the government and has enabled it to subsidize consumer clothing. At the same time, cotton became less profitable for the farmer than other, noncontrolled crops. The cotton area was almost halved between 1952 and 1987, thanks to the government policy requiring farmers to sell all their cotton output to the government at fixed prices that were kept below world market prices. Cotton profitability was further reduced in the late 1970s and the 1980s by rising wages, because cotton is one of the most labor intensive major crops.

Cotton output also declined, but not in the same proportion as the decline in land area, because of the rise in yields. Yields increased over the long term, although they fluctuated annually. Overall, they increased by about 50 percent between 1952 and 1980 but stagnated or actually declined in the 1980s. The continuous breeding of new varieties and the pest-control program organized by the government helped increase the yield. The reduced labor input in the 1980s, however, may have caused yields to level off or drop.

Clover occupied by far the largest area of all crops, increasing by about 500,000 feddans between 1952 and 1987 and comprising about one-quarter of the cropped area in the latter year. The government policy vis-à-vis clover was diametrically opposite to its cotton policy. Clover was used as animal feed, and the government protected both the crop and meat by tariffs. This protection made clover a lucrative crop for many farmers, especially as demand for livestock grew during the oil boom. Farmers, especially small farmers, also had to grow sufficient amounts of clover to feed their draft animals. On one hand, the expansion of animal-displacing mechanization could lead to a reduction of the clover area in the future. Such an outcome would leave more room for basic staples, especially wheat. On the other hand, clover fixes soil nitrogen, and a serious reduction in its area could have an adverse impact on soil fertility. Clover production increased mainly because of the expansion of the land area; little plant breeding was undertaken, and yields remained relatively stable. The slight increase may have been caused by the additional labor time, water, and fertilizers allocated to the crop and by the farmers' delay in planting cotton, which followed clover, so as to allow an extra cutting of clover.

The wheat area remained relatively stable. The stability may be explained by the fact that although the crop was partially controlled, the government procurement price was kept close to the domestic free market price. Wheat was also the basic staple; small and medium-size farmers retained large proportions of it for subsistence or animal feed. The straw also served as animal forage in the summer. Wheat production increased over the long run, because of rising yields. Yields rose steadily, especially between 1980 and 1987; the annual growth rate increased from 5 to 6 percent in the period from 1980 to 1987. The diffusion of high-yielding varieties (HYVs) encountered many problems, however, including susceptibility of the bred varieties to rust and the shortness of their straw-producing stem. Despite these difficulties, the diffusion of HYVs expanded steadily in the 1980s. The area of HYVs increased from about 1,300 feddans in 1978 to more than 128,000 feddans in 1983.

The area planted with corn, which was introduced in Egypt in the nineteenth century, remained relatively stable. Corn was consumed by both humans and animals. It was not a controlled crop; the government, moreover, subsidized yellow corn until 1987 when it raised the price considerably, effectively cutting the subsidy. The rise in production occurred as a

result of the increase in yields. The yields rose by about 40 percent after the completion of the Aswan High Dam in 1964. Perennial irrigation enabled farmers to plant corn during May or June instead of July or August. The new timing afforded the crop cooler temperatures and escape from the summer corn borer. Yields were also bolstered by the application of more water and fertilizers. Plant breeding played virtually no role in yield increases until the 1980s, but HYVs probably accounted for most of the increase in yields in the 1980s.

Rice, grown in Egypt for 1,400 years, saw its area expand sharply by about 500,000 feddans promptly after the Aswan High Dam was built and has hovered around 1 million feddans since then. Rice was an important staple, and about one-third of it was probably consumed by small farm households. It was a partially controlled crop; the government procured one-half of the output and subsidized it to consumers, but procurement prices were close to the domestic free market price. The consumer subsidy was lowered after 1987. Production increased in proportion to yields. Yields exhibited a steady upward movement as water became more available and fertilizer use increased. Yield increase was also achieved by the breeding and diffusion of new varieties. An early maturing variety derived from Japanese rice was diffused through about 25 percent of the area in 1984, compared with 2 percent two years previously. New varieties were being developed by the end of the decade.

One of the most significant shifts in land use was the expansion of the horticultural area. Egyptian farmers cultivated a wide array of fruits and vegetables, including tomatoes, cucumbers, potatoes, lettuce, onions, citrus, and mangoes. Vegetables were planted on more than 1 million feddans by 1980, and the area has stabilized since then. The most prevalent crops were tomatoes and melons, which in 1987 occupied more than 400,000 and 125,000 feddans, respectively. Vegetables were not a controlled crop, and demand for them grew rapidly during the oil boom. Domestic demand leveled off subsequently, and no significant export outlets had been found by 1990. Further expansion would probably depend on establishing such markets, not a simple task considering the stiff regional competition. Yields rose, but it was difficult to determine the sources of overall growth; the combination of more water and fertilizers would be a factor.

The area planted with fruits also expanded steadily and reached about 616,000 feddans in 1987. Fruits, like vegetables, were not a controlled crop, and demand rose with the rise in incomes after 1974. Citrus fruits and grapes, the two dominant crops, were planted on more than 200,000 and 110,000 feddans, respectively. Overall, agricultural crop production increased at annual rates of 2.6 percent between 1964 and 1970 and 3.5 percent between 1970 and 1980, but it stagnated in the 1980s. Yields were relatively high by the standards of developing countries. Rice yields, for example, were higher than those of Asian countries using modern, capital-intensive farming systems, save for that of the Japanese. Wheat and cotton yields were among the highest in the world. Agronomists, however, believed that these yields could be considerably enhanced, given better cultivation practices, management, and pricing policies.

Cropping patterns and crop yields differed according to farm size. The Egyptian farmer grew a variety of crops; there was little single cropping in Egypt as there was, for example, in the United States or in Asia. It is difficult to describe farming patterns in more detail, however, because the scarce information available is inconclusive and sometimes contradictory. A survey of three Delta villages in 1984 found that farmers who cultivated one feddan or less were more likely to grow cotton than those with holdings greater than ten feddans, a conclusion that contradicted findings of an earlier study. It also revealed that yield levels of

different-sized farms varied by crop. For instance, wheat yields were higher on small farms, while the opposite was true for rice. The reasons were not clear, and the findings contradicted a large body of evidence from other countries that showed yields were invariably greater on small farms. There was agreement, however, that larger farms produced proportionally more fruit crops, probably because the high capital investment and the long-term commitment required would be prohibitive to small farmers, who needed more flexibility.

In addition to crops, Egypt had a relatively significant stock of animals that yielded meat, milk, and power. The country had virtually no permanent pastureland, and animals were fed clover, corn, barley, and wheat, competing with humans for the scarce land resources. Livestock populations grew slowly, although steadily, after 1952 and stabilized or even declined in some years during the 1980s. The growth before the 1980s was stimulated by a 100-percent meat protection rate, rising demand, and cheap credit to farmers. The stagnation in the 1980s possibly reflected the limited availability of feed, as is further indicated in increasing yellow corn imports, probably in response to the demand for feed. The number of water buffalo, the primary source of milk on farms and of draft power before mechanization, almost doubled to 2.5 million between 1952 and 1978. The number declined slightly in succeeding years, then climbed again to the 1978 level in 1986. The cattle stock stood at about 1.8 million in the 1980s. The numbers of both sheep and camels continued a downward trend. The number of sheep fell from close to 2 million in 1937 to fewer than 1.2 million in 1986, and the number of camels dropped from 200,000 in 1947 to 68,000 in 1986. The increasing availability of vehicles was probably an important factor in the decline of camel herds, as the beasts were used for transport. The number of pigs remained stable at 15,000; only Egyptian Coptic Christians and Christian foreigners ate pork. Poultry became an important industry in the mid-1970s; the number of chickens approached 30 million in 1986, and the number of eggs approached 4 million.

FOREIGN TRADE

From 1840 to 1930, Egypt had a free trade system, based on the conventions that were imposed by the European powers. The conventions limited tariffs to 5 percent--later 8 percent--on most imported goods. This system constituted a serious obstacle to the country's industrialization. In 1930 Egyptian authorities, in their quest to establish an industrial base, were able to determine their own import duty levels, setting them at 6 to 8 percent for raw materials and up to 15 percent for manufactured goods. Another step toward more independent decision making in the foreign trade domain occurred in 1947 when the government decided to leave the sterling standard and move away from trade with Britain.

As with other aspects of the economy, foreign trade came under government control gradually in the 1950s and then decisively in 1961. From that year until Sadat's *infitah*, all exports, imports, prices, and payments were handled by public organizations and enterprises. The government, however, did not have an entirely free hand in running foreign trade. It had to operate within the constraints of domestic supply and demand and under the compromises reached with bilateral trading partners. The private sector also could still export fruit and vegetables and a few other items.

The state monopoly on trade was eased in the 1970s. Initially, private firms were permitted to import some commodities under particular conditions. Then, in 1976 the government holding company that had controlled foreign trade was abolished, and the private sector was able to

trade in most goods, with a few exceptions, such as cotton. The government, especially under Mubarak, offered investment incentives that included fewer restrictions on imports and exports of commodities by the private sector. The government also extended the multirate exchange system, in part to facilitate foreign trade transactions. But the multiple exchange system created statistical difficulties, and foreign trade accounts could be more consistently examined if expressed in dollars or Special Drawing Rights (SDRs--see Glossary) of the IMF.