

91. *Philippine Daily Inquirer*, October 31, 1987; AID Congressional Presentation Fiscal Year 1986, Annex II, 250.
92. For a detailed account of U.S. relations with the Marcos regime, see Raymond Bonner, *Waltzing with a Dictator* (New York: Times Books, 1987).
93. Data provided by U.S. Embassy, Manila.
94. Data supplied by U.S. Embassy, Manila.
95. Data supplied by the Office of Economic Analysis, Bureau of Intelligence and Research, U.S. Department of State.
96. Data supplied by the International Banking section, Federal Reserve Board, April 1, 1987.
97. Interviews with two U.S. officials stationed in Manila during this period, both of whom request anonymity, Washington, D.C., February 15 and 24, 1987.
98. Interview with former U.S. diplomat in the Philippines who requests anonymity, Washington, D.C., January 15, 1987.
99. "Philippines: Population Program/Progress," information supplied by AID, *Foreign Assistance Legislation for Fiscal Year 1985 (part 5)*, Hearings and Markup before the Subcommittee on Asian and Pacific Affairs of the Committee on Foreign Affairs, House of Representatives, 98th Cong., 2nd Session, 1984, 215.
100. See "Country Development Strategy Statement, FY 1984: Philippines," AID, Washington, D.C., January 1982, 9.
101. Agency for International Development, Congressional Presentation FY 1988, Annex II, Asia and the Far East, 253.
102. *Agenda for Action*, 150.
103. For a critique of the Baker Plan by a former Treasury Department official involved in its planning, see Robin Broad, "How About a Real Solution to Third World Debt?" *The New York Times*, September 28, 1987.
104. See John Cavanagh et al., *From Debt to Development* (Washington, D.C.: Institute for Policy Studies, 1985), 49-50.

IV

Dimensions of National Security: The Case of Egypt*

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In ancient times Egypt was referred to as the "gift of the Nile"; its rich alluvial soil and reliable waters fostered one of the greatest ancient civilizations, and the coastal plain was productive through the 11th century. Today, however, 96 percent of Egypt's territory is uninhabitable desert. Most of Egypt's 50 million people live on a ribbon of land along the Nile and in its delta. Serious problems of degradation and pollution throw into question the valley's ability to support its population and to sustain agricultural growth equal to Egypt's rapidly increasing numbers. Two mutually reinforcing trends, high population growth and strong pressures on the resource base, raise urgent questions for Egypt—and for United States interests in Egypt and the Middle East.

Although scientists and experts agree that these pressures are serious, they are not yet a priority for the government of Egypt, which is well aware of the need to expand cultivated areas, to increase productivity, and to create jobs and income for those who no longer live off the land. Active attention is given by the government of Egypt, U.S. policymakers, and academics to energy, agriculture, industrial development, education, health, and population growth. But rarely do any of these people deal with the mutually reinforcing and dislocating forces working together. The Mubarak government's concerns are with energy, the military, the political opposition and the survival of new institutions in relative freedom. United States policymakers still think primarily in terms of military

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security against Soviet inroads in the Middle East and Egypt's role in U.S. regional defense strategies.

Historical Context

Since the decline of the ancient civilization, Egypt has been ruled mostly by foreigners. Conquered by Greeks, Romans, Phoenicians, and, centuries later, Arabs and Turks, Egyptians were alienated from their leaders.¹ The revolution of 1952 for the first time brought in an Egyptian as leader. Under President Nasser, Egypt was noted in the West primarily for its claim to leadership of the Arab world and for the revolution's concerns for social equity and economic development. The nation embarked on industrialization, the modernization of agriculture (with special attention to cotton for export), and the construction of the Aswan Dam to control the Nile, generate electricity, and increase irrigation.

In the early 1960s, commercial banks and most medium-sized and heavy industries were nationalized, and measures were instituted to expand employment and redistribute income. Considerable investments were made in social services, especially in education, and public jobs were guaranteed to college and secondary-school graduates (and later to military conscripts dismissed from the services between 1973 and 1976), making the public sector the largest employer except in agriculture. Private-sector small manufacturing firms employing up to 10 workers—shoemakers, tailors, carpenters—enjoyed a great boom between 1967 and 1974, stimulated by favorable export terms with Eastern bloc countries.

Until they were expelled by President Sadat in 1974 and Egyptian policy shifted toward the West, the Soviets and Eastern bloc countries provided the bulk of foreign investment, markets, and technical aid—as well as military assistance. Now, however, Egypt is squarely in the Western camp.

After Sadat's economic liberalization in 1974, Egypt experienced phenomenal growth. Private and international capital poured in, stimulating growth and employment in the nonagricultural sector. The government encouraged overseas employment, with important results: now 15 percent of the labor force is employed outside of Egypt, mostly in the oil-rich Arab states. Though opportunities rise and fall with the price of oil, the remittances of these workers are Egypt's single most important source of foreign exchange and, when they reach home villages, a boost to the standard of living in rural areas. During this time rising urban demand increased profits on the sales of crops whose prices were not controlled by the government (fruits, vegetables, and birseem). Tourism rose. Oil became the most valuable visible export, as Egypt came into the world market just as the Organization of Petroleum Exporting Countries (OPEC) embargo took hold and world oil prices skyrocketed. And after the peace treaty with Israel, U.S. assistance, both military and economic, multiplied.

Population doubled between 1952 and 1980, but the economy kept pace in most respects. Because of Egypt's social policies, and despite mistakes and mismanagement, opportunities expanded, incomes increased, and distortions between rich and poor were largely avoided. The extremes of rich and poor found in Latin America, the Philippines, and elsewhere were not evident in Egypt.

By the late 1980s things became more difficult for Egypt. Oil prices were down, debt payments were up, and remittances were not growing as fast. Mubarak's government undertook some experiments with a more politically liberal constitution and a freer press—and with sometimes too-close-for-comfort relations with the United States.

Underneath the ups and downs of post-revolutionary governments, two trends climbed steadily: population and natural resource problems. And Egypt's long-term security and U.S. interests therein are held hostage to these fundamental underlying trends.

U.S. Interests in Egypt

United States interests in Egypt are dominated by straightforward political and military concerns, though the articulation of those interests is argued usually only with reference to military or political security, and rarely with respect to Egypt's population/resource balance. Egypt is the largest nation in the Middle East (in terms of population size); its integrity is least questioned (in terms of historical continuity); its identity is established and stable (Egyptians have little difficulty defining themselves as such); and it is the most developed of the Arab states (in terms of literacy, education level, institutional capabilities, and all other indicators of "development" aside from oil wealth). Egypt's strategic location is critical geopolitically, and, having discarded the Soviet links and rejected the "socialist ideology," it is a key nation in the Western alliance.

The military interests of the United States in Egypt are considerable. A viable United States military posture in the Middle East depends significantly on the capabilities of its allies and their general support for U.S. priorities in the region. An integrated military stance with Egypt enhances U.S. capabilities to pursue United States objectives in the region. In the last analysis, Middle East defense policies for the United States continue to involve the capacity to contain Soviet pressure, to assure access to oil supply, to keep the Gulf and the Suez Canal safe for international shipping, and to contain regional conflicts and turmoil. United States military assistance to Egypt—now running at \$1.25 billion per annum—is a reflection of this importance.²

The United States is involved in supplying, training, monitoring, and managing Egyptian military capabilities. The logic of the United States rearming Egypt following the Camp David accord in March 1979 was based on establishing a leaner, more effective Egyptian military, capable of responding to

a variety of scenarios relevant to U.S. concerns. For example, the United States expects Egypt to provide support for U.S. military activities, to serve as a surrogate and covert instrument of U.S. military policy, and on all issues involving U.S. strategic concern to provide logistical support.³

In entering into a military assistance treaty with Egypt, the United States assumed that Egyptian political and security interests were identical to those of the United States, that U.S. priorities would supercede those of the Egyptian leadership, and that the imperatives of the alliance would override those of the junior partner. These assumptions emerged as flawed, and U.S. expectations unrealistic. Nonetheless, the military link remains strong, and is a relationship essential to the posture of both the United States and Egypt. On the Egyptian side, there is some disenchantment among segments of the professional military who perceive that the alliance engenders costs that exceed the benefits.

Such assumptions and assessments may erode U.S. military security in the region. But far more serious, from the U.S. perspective, are any threats to Egypt's stability and overall security. An "insecure" Egypt, for whatever reason, remains antithetical to U.S. interests. With considerable turmoil in the region—in Iran, Iraq, Lebanon, Libya, Sudan, Ethiopia, Mauritania, Somalia, and Israel—"losing" Egypt remains a risk no U.S. administration wishes to run.

In dealing with Egypt, the United States is dealing invariably with the Arab world as a whole. The events of the past decade have illustrated the robustness of the Egyptian role in the Arab world. Even a treaty with Israel could not break Egypt's many ties with the Arab countries. And while, as has been well put, "the Arab state that did most of the fighting decided to change its profession," the interdependence with the Arab world has emerged mostly unaffected by this dramatic diplomatic move.⁴ Egypt's attendance at the Fifth Islamic Conference in Kuwait, in January 1987, is testimony to the influence of an Islamic state whose population of 50 million is regarded in the region and elsewhere as a factor of nontrivial proportions.

U.S. economic interests in Egypt are less pressing than the political or military concerns, but relevant nonetheless. During the past decade, Egypt has become an oil-exporter. Increasing petroleum and natural gas revenues have contributed in part to the expansion of imports from the United States in recent years, as has a huge increase in U.S. economic support funds. Between 1978 and 1986, U.S. exports to Egypt more than doubled, from \$1,134 million to \$2,704 million, whereas Egyptian imports to the United States rose only slightly, from \$105 million to \$170 million. Compared with U.S. economic ties with Saudi Arabia, the U.S. trade balance is always positive. Indeed, the United States is Egypt's most important trading partner, a source of foodstuffs, machinery, and equipment and fertilizers.⁵ The trade balance improved (from a U.S. point of view) to \$51,385 million in 1985.

Clearly, Egypt's imports of U.S. goods and services would not have been possible without U.S. economic assistance. Over the past decade U.S. aid to

Egypt for development and civilian purposes amounted to more than \$10 billion. In 1989 Egypt received 11.3 percent of all food aid given by the United States and about 23 percent of the total budget of the U.S. Economic Support Fund.⁶ In fact, Egypt received roughly 16 percent of the total U.S. Agency for International Development (AID) budget in FY 1989. (Only Israel received more aid, and in cash—a bone of continuing contention in Egypt.) The total figure for assistance from 1977 to 1989, including military aid, is about \$33 billion.⁷ For the United States, however, Egypt's importance cannot be counted in dollars. Egypt is literally the gateway to the Arab world. The most important of Egyptian assets to the United States for the decades to come is the nation's geopolitical position—as it was to Britain and other European countries in the last century. As long as U.S.-Soviet competition in the region continues, Egypt is an invaluable ally to the United States. U.S. strategic interests in the Middle East are therefore best served by a secure Egypt—a nation threatened neither by erosion of its military capability and sovereignty, nor by challenges to its governance or by undue pressures on its resources and environment.

Egypt's National Security

To get a balanced picture of Egypt's security, three critical dimensions must be considered. The conventional view of security is that of the state against external aggression and the capacity of the state to exert its sovereignty and its control over its territory. Egypt's military security is thought to be enhanced primarily by its manpower, weapon systems, and performance. With one of the largest armies in the Middle East, modern weapons and equipment, and backing by the United States, Egypt is clearly secure, despite the hostility of its western neighbor, Libya.

A second essential dimension of national security, concerns political stability, or governance. This is the security of government against pressures from society; it refers to the capacity to ensure legitimacy for the regime in power, to guarantee domestic support for government policies, and to assure that government policies will effectively deal with challenges to authority created by perceived threats, whether internal or external. Political security is not independent of military security: to the extent that a country's borders and its sovereignty are ensured, a prerequisite for political security is met; this condition is necessary, however, but not sufficient. Though the Mubarak regime is often referred to as a weak government that shares its power with a large independent military and is challenged by a politically and economically significant religious fundamentalist movement, it is nevertheless the legitimate government in the eyes of the Egyptian people.

The essential and necessary condition for the security of any state is the third dimension of the security complex—the sustainability of the resource base in light of the pressures and "demands" of the population and the level of

technology of the society. Resource security refers to the broad socioeconomic framework supporting the state, in terms of overall contextual and structural viability. The absence of this type of security will be manifested in trouble and disorder in political security due to the internal pressures and the inability of the government to contain, manage, regulate, diffuse, or export the pressures on its resource base. To the extent that internal pressures are greater than the state's capacity to contain them, threats generated by the absence of resource security can strain the Mubarak or any other regime and translate attendant pressures into threats to political security. In simple parlance, political security can be eroded from "above" (by threats of a military nature or transgressions on sovereignty) or from "below" (from pressures of population demands given prevailing capabilities to meet them). The former seems not likely now in Egypt; the latter bears further examination.

The elements of this third type of security include, first, human resources—in Egypt, a population of 50 million in 1986, growing at a rate that translates into a doubling time of 26 years. This is a prodigious number of people to feed and put to work. But to consider Egypt's population only in a negative way, simply as a load or source of pressure, is misleading. People embody technology (education and management), can become an important economic resource (due to billions in foreign exchange remitted by Egyptian emigres), and are generally considered as the single most critical element of Egypt's national power.

The second element is education and technology—found in Egypt's highly literate public, 11.5 percent of whom have higher, and often highly technical, training. The Ministry of Agriculture, for instance, is said to have more than 400 Ph.D.s with credentials not only from Egyptian institutions, but from the "best" of the West as well.⁸ The skill and experience with which a people "convert" and otherwise manage resources to meet demand is a key element in the population/resource balance—and Egypt has a wide lead over most other Arab countries.

The third element is the natural resources of the nation—land, water, and oil being Egypt's primary ones. Land and water, properly husbanded, are renewable; the extent of oil is uncertain. At current rates of production, known petroleum resources will surely last until the turn of the century; beyond that there are major uncertainties, despite possible deposits in the western desert.

Policies and practices that pollute essential resources like water and air, that degrade the land base, or that squander the mineral resources, destroy the continuing capacity of a nation to support its human resources. Good management of resources makes development and growth sustainable. Policy can mediate, intervene, influence, and shape the disposition and distribution of human and natural resources, even when it cannot fundamentally transform critical parameters.

In sum, a state is secure to the degree that all three dimensions of security are under control. Because the security of states is the single most important priority

for national policy (everything else is derivative), it is essential to understand the entire security matrix—its military, political, and resource dimensions. The interconnections among the three dimensions will define the nature and extent of a state's true security at any point in time.

Population

Most analysts agree that "population pressure, especially on land and water resources" is labeled "Egypt's principal economic problem," to quote one AID environmental report.⁹ However, population is not often mentioned as priority by either Egyptian or U.S. policymakers concerned with Egypt's security. The population of Egypt in 1897 is estimated to have been 9.7 million. At the time of the revolution in 1952 it was approximately 20 million. By 1982 it had more than doubled once again. There are negative as well as positive sides to these numbers.

Birth rates have declined from 44.3 per 1,000 population in 1927 to 34 in 1986, while death rates plummeted in the same period from 27.1 per 1,000 to 10. Average annual growth rose from 1.51 percent in 1907 to a high of 2.7 percent in 1986. It has since declined to 2.31 percent—which translates into 1.7 million additional Egyptians each year. Forty percent of the population is under 15, 4 percent is over 65. Life expectancy at birth is 58.3 years, up from 46.7 in 1970.¹⁰

According to the United Nations medium-case scenario, Egypt's population is projected to be 65.2 million in 2000. It will double today's total, to approximately 100 million, in the year 2012.

In 1985, 46.5 percent of the population was urban, up from 37.9 percent in 1960. The rate of urbanization appears now to be a steady 3.3 percent per annum.¹¹ One-third of the nation's people are concentrated in cities of over 100,000. Cairo, with over 10 million people, is one of the most densely populated cities in the world.

The labor force in 1983 was 12.75 million, with approximately 400,000 workers joining annually, making job creation critical to political security. The labor force grew annually at 2.2 percent in 1965–73, at 2.4 percent over the following decade, and is estimated to grow at 2.3 percent a year through the year 2000.¹²

Each year less of the work force is employed in agriculture, even in the rural areas, and more in industry. On the basis of 1983 International Labour Organization (ILO) statistics, 56.6 percent of the labor force was in non-agricultural occupations and 41 percent in agriculture.¹³ And even in rural areas, 28 percent of the labor force works in non-agricultural jobs. Labor surveys in 1983 placed unemployment at 6.6 percent,¹⁴ though it is probably higher now given the drop in oil prices and levelling off of remittances. (See Table 1.)

Egyptians employed abroad remain a major source of foreign exchange. Since remittances flow largely through internal channels, this financial resource goes

Table 1. Percentage of Work Force by Sector

	1974	1979	1983
Agriculture, hunting, forestry, fishing	47.34	41.84	40.97
Mining, quarrying	0.23	0.24	0.28
Manufacturing	15.28	16.02	14.72
Electricity, gas, water industries	0.46	0.69	0.87
Construction	2.63	4.69	5.37
Trade, restaurant, hotel	11.63	9.60	8.84
Transportation, storage, communication	4.47	5.11	4.95
Finance, insurance, real estate	0.97	1.22	1.29
Community, social services	16.48	19.03	21.07
Others	0.53	1.57	1.63

Source: Calculated from Table 3B in *ILO Yearbook of Labour Statistics 1986*. Copyright © 1986, International Labour Organisation, Geneva.

directly to private citizens and is not available to the government. A "hidden economy" has developed, large in scope and scale, that remains outside government control and co-exists with the formal economy.¹⁵ The government continues to devise means to reduce the scope of this economy by liberalizing exchange rates. The results to date are mixed.

Education and Technology

Investments in education increase the capabilities of the population, and the "technology" of the society. Egypt's population is a relatively well-educated and skilled resource. Emphasis on education by all three governments since the revolution has transformed the country. A major commitment, sustained by a large budgetary outlay, has been made. Though some 60 percent of the semiskilled workers in public industry are still illiterate, as are many of the rural poor who emigrate temporarily to work elsewhere in the Arab world, nevertheless enormous strides have been made. Even illiterate workers have some skills, as in the construction sector.¹⁶

On the primary school level, enrollments went from 75 to 84 percent of the relevant age group between 1965 and 1984. Secondary school enrollments went from 26 to 58 percent, and university enrollments from 7 to 21 percent.¹⁷ University education is free for those who qualify, and the government has also sent thousands of Egyptians abroad, to universities in both the East and West for specialized training. In comparison with most other lower middle income countries, the gains at the secondary and university levels are really impressive. (These are averages for male and female—in every case the Egyptian males have higher enrollments than do females.) The problems surfacing now are the relevance of curriculum and the maintenance of quality, as demand outstrips supply and class sizes swell. There exist shortages of certain kinds of skills in the public sector: math and science teachers, computer scientists, and specialized medical personnel, all of whom can find better paying jobs overseas or in the emerging private sector.

Egypt in fact bears the cost of educating much of the Arab world. Until recently students from other Arab countries have also been educated tuition-free at the University of Cairo, which has distinguished graduate schools in many fields. Egypt has supplied teachers, school administrators, engineers, physicians, managers and other professionals throughout the Arab world since the 1930s. Some critics question whether Egypt recovers the cost of those it has educated, even through remittances. The whole system is expensive, but it serves political and cultural purposes, reinforcing Egypt's ties with Arab states.

The country's 11 universities have generated cohorts of Ph.D.s. Most of them are employed in national laboratories and research institutes—the National Academy of Science, for instance, has 4,000. Trained individuals are not a scarce resource—the issue is the quality of training and the organizational difficulties of utilizing them effectively. All of this bears on the country's technology, and on the ability to fully utilize its skilled work force.

Already, higher education policy is a source of tension because the government is trying to cut back its annual support. A related question is whether Egypt can maintain its investments in education as the current baby boom matures to parenthood and doubles the number of classrooms and teachers required. There is already grave concern that Egypt is not giving sufficient attention to nurturing and developing its human resources to maintain its international comparative advantage and assure its continued "market share" of this important "product."

Natural Resources

Egypt's human resources appear to be the only ones in abundant and reliable supply. Her natural resources—rich alluvial soil, the waters of the Nile, petroleum and natural gas—are all more finite. Egypt's total area is 386.7

thousand square miles (about the size of Texas and New Mexico), of which 2 percent is cultivated.

Agriculture

Traditionally, agriculture sustained Egypt, and the Nile sustained agriculture. The sector remains central to the economy despite decades of emphasis on industrialization. There has been some decline in arable land and permanent cropland (from 2,653,000 hectares 20 years ago to 2,469,000 in 1982–84) due to urbanization,¹⁸ but agriculture still accounts roughly for 18 percent of the country's gross domestic product, and employment in this sector claimed 41 percent of the work force in 1983. Cotton is the country's second largest export after oil. Livestock, food, and beverages are among its principal imports.

The agricultural sector's performance is fraught with problems, many of which are induced by a government pricing policy that has been explicitly biased against food crops. Nonetheless, agricultural production grew consistently over the past 20 years. Using 1974–76 as a base for an index of 100, performance for the previous decade was 82, and for 1982–84 the index was 114.¹⁹ Productivity per worker also increased, although more modestly and not as fast as increases in most other developing countries. A near tripling of fertilizer per hectare of arable land accompanied a substantial increase in total food production over the past 20 years, but production has dropped in per capita terms. And yields for all major food crops have stagnated or declined since 1970 by comparison with most developing countries.²⁰ More critical, however, is the decline in calories produced domestically as a percentage of total supply, from 91 percent in 1967–70 to 79 percent in 1977–80.²¹

Productivity in food crops, however, appears high. The average annual grain yield per hectare increased from 3,921 kilograms (1974–76) to 4,254 kilograms (1981–83). This latter looks strong next to a figure of 4,075 for the United States²² and compares well with other developing countries—until one remembers that almost 100 percent of Egyptian farmlands are under irrigation. If only irrigated yields were compared, Egyptian yields would be lower considering the excellent soil, sunshine, and water inputs in that country. The rate of yield growth for major food crops in Egypt declined between 1963–67 and 1978–82 compared with that of 36 other developing nations.²³

A joint study by Egypt's Agriculture Ministry and AID in the summer of 1982 was reported to show a possible long-range tripling of yields from existing farmland with better management.²⁴ Decades-old central government planning has mandated which crops would be planted and rotated and has restrained productivity. To compound their hardship, prices paid to the farmers have been fixed irrespective of costs of inputs. As these went up during the 1960s and 1970s, prices for the key crops covered (rice, wheat, cotton, sugar, maize, and meat) remained artificially low. When wages skyrocketed after 1973, the terms

of trade actually became negative for the farmer, who in many cases was violating rotations and dealing in the black market. In 1975, controls on food crops were eased somewhat, and the farmgate price of cotton more than doubled. Poverty in rural areas declined appreciably in the 1970s, due not so much to development policies as to remittances, 20 to 40 percent of which are estimated to find their way into the countryside.²⁵

Among the economic reforms announced by the government for 1987 were progressive increases in prices for farmers. This move had been one condition for International Monetary Fund credit, and is being pushed also by AID.²⁶ An additional boost is expected as controls over what farmers may produce are phased out over three years.²⁷

Consistent with the government's industrialization strategy, agriculture's share of public investment remains small. It declined from 24 percent in the mid-1960s to 8 percent in 1978, and most has gone into sometimes questionable and always expensive drainage and land reclamation projects, not to improved management, seed, and fertilizer.²⁸

Contributing also to declining agricultural production is the encroachment of urbanization on productive farmland. The assault remains unchecked, as even the government continues to build on scarce agricultural land.²⁹

Because the population continues to outstrip agricultural production, food imports in 1987 cost the government over \$10 million a day.³⁰ Wheat and flour imports for 1986 have been put at \$1 billion.³¹ Such voluminous food imports, both purchased and donated, along with subsidies to favor the more politically influential urban dweller have continued to keep prices for staples low.

In terms of agricultural output, cotton production must be considered separately from food production, because different policies and different market conditions have variously affected performance. Cotton, Egypt's chief export crop, appears to fare respectably. This crop, in particular, has benefited from pesticide subsidies.³² Preliminary estimates for 1986/87 showed it to be a great year, with Egypt producing only slightly less than Turkey, the biggest producer in the Middle East. Plans called for increased cotton acreage and improved yields.³³ Some industry observers suggested, however, that targets may be somewhat overambitious. They expected exports to decline in 1986–87 to 660,000 bales from 700,000 bales in 1984/85. Sales should have been worth \$400 million.³⁴ But the future is clouded by a depression of the world market price for cotton.

Cultivation in Egypt is highly mechanized by most developing countries' standards. Nonetheless, observers have argued that a relatively slow rate of mechanization has contributed to the stagnation of labor productivity.³⁵ But the data bear reviewing: in 1964–66 there were 5.5 tractors per 1,000 hectares of arable land; by 1981–83 the number of tractors had grown to 16.2.³⁶ Heavily subsidized gasoline prices may encourage tractor use. In one remittance-rich village, the number of tractors increased from one to 200 over the last 20 years.

Yet even with 100 mechanical water pumps, the cultivated area of the village increased by only a little over 10 percent.³⁷

The Egyptian leadership's "consistent neglect of agriculture" has led to what one analyst identifies as "development without qualitative structural change."³⁸ The combination of controlled prices, a misdirected investment policy, and other institutional factors has debilitated the agricultural sector. Remittances have reduced rural poverty, and clearly reinforced social equity, but they have not been invested substantially in agriculture. Major changes in agricultural investment directions and the introduction of technologies that will improve the productivity of very small farms—neither of which is yet apparent—will be required to revitalize this sector.³⁹

In addition to declining productivity, agriculture is plagued by a series of environmental problems—many of them caused, ironically, by "development." These are discussed later in the chapter.

Energy

Energy production and consumption in Egypt has experienced phenomenal growth over the last two decades. Oil, gas, and hydroelectricity are the important sources, with potential, still, for bioenergy, solar energy and conservation efforts.

Oil, and gas which was developed in the 1960s, took off after the embargo in 1973. Led by a significant increase in petroleum production, Egypt multiplied its total energy output four times in less than a decade.⁴⁰ As an international petroleum producer, Egypt ranks fifteenth, with nearly 900,000 barrels a year. The country now produces more crude oil than Algeria or Qatar and more natural gas than Iraq. As the fifth largest non-OPEC free market producer of crude oil (after the United States, Canada, Mexico, and the United Kingdom), Egypt is becoming a player of note in the world oil markets.⁴¹ Indeed, petroleum has become Egypt's most valuable official earner of foreign exchange, amounting to \$1.1 billion in 1986. Oil production has placed Egypt's trade balances in a solidly favorable position and has literally fueled industrial development.

Crude oil accounts for most of the country's growth in production, but natural gas is of increasing importance to select industries and many households.⁴² Further development of natural gas is a major objective of the country's current energy plan and a "gas clause" is included in every foreign contract for exploration and development.

The petroleum sector in Egypt—both extraction and refining—is effective, well managed, and performs strongly. Attractive crude blends and aggressive promotion have developed markets, principally among Western nations, though exports to Japan are increasing. Refinery capacity has been devoted mostly to energy: more than half the product is residual fuel oil, but a small fraction goes to lubricants and asphalt.

Hydropower (mostly from Aswan) is the second major source of energy, accounting for 46 percent of electricity production, but this source is expected to be less important in coming years.⁴³ Solar energy has high potential for Egypt. Analysts believe that solar energy may be useful for the development of water resources in remote areas of Egypt. A major experiment is under way in Alexandria, where the largest unlined solar pond is being built.⁴⁴ But this source of energy has received minimal attention from the authorities, and there is no incentive for private development.

Domestic consumption of energy has dramatically increased over the past 10 years, when petroleum use alone rose annually at an average rate of 10 percent.⁴⁵ It paralleled a rapid growth in the economy, confirming the relationship between energy consumption and gross national product in an expanding economy that is experiencing industrialization and urbanization. The Egyptian government, concerned that existing electric power capacity is barely enough to keep ahead of demand, plans the addition of several gas- and oil-fired plants in the next couple of years. Longer term proposals include plans for coal-fired plants at Zaafarana and Ayun Musa, and up to eight 1,000-megawatt nuclear generating stations by 2005. Plans to build the first of these, at Alexandria, were put on hold after the Chernobyl disaster, and have been further dampened by AID and World Bank concerns both about the gross underpricing of electricity and the possibility that the demand has been exaggerated. AID has announced that its future involvement in Egypt's energy programs will be limited to efficiency improvements.⁴⁶

Increased consumption reflects population growth to some extent, but much more important have been the government's domestic subsidized price policies, which have literally induced an upward spiraling of consumption, encouraging waste and inefficiencies in industrial processes and in residential and transportation use and adding to pollution problems. Fuel oil, for example, is sold to the Electrical Authority at \$5.40/ton, and to other public sector users at \$11–23/ton, compared with \$115/ton on the open market.⁴⁷ Energy subsidies cost the government about \$4 billion per year.⁴⁸ Local consumption at rates around one-fifth the world price eat into the amount available for export and reserves for the future, give false signals to other sectors of the economy, and contribute to air pollution in the cities. According to one energy analyst, "Energy is not only cheap in Egypt, but it is getting cheaper."⁴⁹ Indeed, continued growth of domestic consumption remains a significant obstacle to the country's energy performance.

A second constraint on the future is geological: of the four provinces with considerable oil or gas beneath them—the Nile Delta, the Gulf of Suez, the Northern Sinai, and the Western Desert—only the last, and the largest (in geographical span), remains largely unexplored. At current rates, production of known resources can easily be sustained for another 15 years or so. Beyond that time, given existing knowledge about reserves, decline sets in, and production

costs will increase substantially. Geological conditions and the size of unknown reserves will determine Egypt's energy future. Reliance on international oil companies for both capital and technology increases Egypt's dependence on international economic conditions—and on the world price of oil. With declining prices, incentives for exploration are reduced; drilling declines. Egypt does not really know what the Western Desert holds—or does not hold.

The conventional view is that raising domestic prices to their international equivalents will reduce consumption and force a great degree of efficiency in industry and manufacturing. Yet it is worth remembering that technologies in place in select large energy-consuming industries (such as the Helwan steel plant or the Kima fertilizer plant) cannot readily adjust to price changes. Engineers have pointed out that the outdated designs and technological constraints are more responsible than price distortions for Egypt's "energy waste" in the steel plant or the fertilizer plant.

In energy as in agriculture, Egypt appears through its selection of development projects, its subsidies, and its support for the poorer segments of society to be living off its resources in a way that cannot be sustained over the long term.

Environmental Quality

Egypt's environmental concerns fall into three categories, according to their source. Degradation of the land and of water quality are primarily the result of development efforts to expand and improve agriculture. The urban problems of air and water pollution, and the health implications attending both, are manifestations of a generation of rapid urbanization and industrialization. The phenomenal growth of the 1970s and early 1980s in particular have an environmental price that has not yet been paid. A third set of environmental impacts have their cause in practices that are international.

These problems place further constraints on economic growth, or make it more difficult and costly, at the same time that population increases multiply demands for food, water, sanitation, energy, and jobs. The decades ahead will not easily enjoy the kind of phenomenal growth that over the last two decades put Egypt in the World Bank's "middle income" countries. Patterns of environmental degradation, none of which has yet peaked or declined, are not widely recognized in Egypt or the United States as the major components of resource security. They are certainly not thought to be threats in any sense to political security. But the Egyptian government's ability to deal with these problems and the extent to which such issues impede the efficiency with which resources can be converted to meet domestic demand will increasingly shape national security. The question is: at what threshold does public concern with the environmental problems themselves, or with their negative effect on growth, lead to a challenge of the legitimacy of the government?

Soil and Water Degradation. From the first years after the 1952 revolution, the government has been aware of the need to expand agricultural production. Wisely or unwisely, the control of the Nile through construction of the Aswan Dam was the primary solution advocated. The results are mixed. Agricultural production increased as water became available year-round for irrigation, but the elimination of the annual flooding over the banks and year-round cultivation have created serious problems. Waterlogging, downstream problems from runoff, and attendant health problems have since been documented by Egyptian and international analysts.⁵⁰ These were not unexpected in the 1950s, but in Egypt as elsewhere round the world they were ignored as big dams were seized upon as the key to agricultural development, assured energy supplies, and increased political independence.

Due to perennial irrigation and inadequate drainage, the water table rose in many areas within a few years after completion of the High Dam in 1969. Estimates of resulting waterlogging and salinization vary from 28 percent of Egypt's productive land to 50 percent more or less affected, and almost all irrigated land has been found to be potentially salt-affected.⁵¹ By one estimate, 10 percent of Egyptian agricultural production is lost every year due to the deterioration of soil fertility. Stretches of once-lush green farmland have a sparkling white salt crust and reddish halophyte vegetation.⁵² Only in Iraq and Pakistan is a higher percentage of irrigated land affected by salinization.⁵³ Corrective drainage systems are very expensive and their implementation further constrained by the small size of Egyptian farms, shortages of materials, and difficulties in coordination. Although AID has made a major commitment to help the government install drainage tiles, the program remains behind schedule.

At the same time nutrient-rich silt—some of it from the mountains of Ethiopia—is piling up behind the dam. Before 1969 it was spread by annual flooding over the fields. This loss of natural fertilization is now compensated for by an annual application of 13,000 tons of calcium nitrates,⁵⁴ which further contributes to salinization of runoff.

Siltation in Lake Nasser behind the dam has also had effects in the Mediterranean off the Delta coast, where it previously augmented the supply of plankton that fed a productive sardine fishery. That fishery, which produced 18,000 tons in 1962, has virtually disappeared—due also to offshore pollution and overfishing. (At the same time, it should be noted, new fishing communities came into being all along the 1,400-kilometer perimeter of Lake Nasser,⁵⁵ and fisheries are not scarce nationwide.) Siltation in Lake Nasser also deprived the delta shorelines of sediment replenishment and contributed to shore erosion.

Perennial irrigation and permanent water supplies, not known in many areas before the High Dam, also provide year-round habitats for water-related diseases. Their control is an environmental as well as a medical problem. Schistosomiasis has greatly increased, migrating south from Cairo, and now 36 percent of the population suffers from the disease. The portion is higher among

rural people, for whom it is an occupational hazard. The disease is extremely debilitating, and it costs Egypt on the order of \$500 million a year. Water sources can be cleaned up, but are very easily reinfected.⁵⁶

Aquatic weeds, especially the notorious water hyacinth, are no longer swept away by annual flooding. Eighty percent of Egypt's waterways are said to be affected. Strong weed growth in Delta canals is a particular problem. Controls—mechanical cutting, herbicides, and introduction of carp—are only partly effective in keeping the waterways clear.

Soils and water are also polluted by pesticides, especially in connection with growing cotton. Egyptian farmers make intensive use of organophosphorus and organochlorine pesticides, supplied by the government, to protect their crops. The average annual use of pesticides in Egypt is almost 30,000 tons, of which 70 percent is directed at controlling cotton pests. No attempts are yet made to control pesticide use or avoid pesticide penetration into food and the soil. Overuse of pesticides leads insects to develop a resistance to them. Farmers then have to shift pesticides frequently. The number of Egyptian insects resistant to pesticides grew from 14 species in 1948 to 364 in 1976.⁵⁷

Egypt spends over \$200 million each year to subsidize pesticides—without rigorous assessment of the benefits returned. In a 1986 World Resources Institute study of pesticide subsidies in nine countries, Egypt's subsidies were extensive and expensive. The government bore 83 percent of the cost of pesticides to farmers through allocation of foreign exchange at preferential rates, exemption from import duties, and consumption taxes.⁵⁸

These figures do not count the health and environmental costs associated with pesticide use. As in other countries, these chemicals are sold to untrained farmers without adequate control or supervision. The subsidy amounts to \$4.70 a year for every man, woman, and child in Egypt, whereas the government spends \$7.34 per annum on health and \$33.06 on education. And as in other countries, the government has no way of knowing whether these subsidies are accomplishing their purposes. The development, environment, and health questions raised have not yet been answered: might this money be better spent on other programs, such as integrated pest management? Or on increased productivity, reclamation, or the draining of water-logged soils?⁵⁹

The problems attendant on irrigation and pesticide use are not without solution. Construction of drainage has been alluded to already, and alternative pest strategies are being employed in other countries. But existing technical knowledge is not always used in Egypt. An AID report said Egyptian policy and international lending agencies are all to blame.⁶⁰

Even if the damage to soil and to human health were much less than reported here, the dimensions of the problems would still be serious. As in many other areas around the world, Egypt's current and future generations are paying for the environmental consequences of past development schemes. In Egypt, the full seriousness is masked by remittances and social equity policies that have

lessened the impact, especially on the rural poor who might otherwise have experienced severe hardship.

The Urban Environment. As of 1987, 48 percent of Egypt's people lived in cities. Urbanization was growing at an average of 3.7 percent from 1980 to 1987. Cairo, one of the 10 largest cities in the world and still growing, is a bustling, sophisticated capital where a person can find anything and everything. And as in other metropolises, air and water pollution problems are obvious even to the untrained eye. Enteric diseases and dysenteries are still the major causes of death among young children.⁶¹

Water pollution problems are exacerbated by strains on aging sanitary facilities. In particular, the sewage systems of Cairo and Alexandria are heavily overloaded. In greater Cairo about 75 percent of the effluent, partly treated or untreated, is released into open drains.⁶² In 1982, sewers in the Giza section broke, flooding the city. Most of Cairo's sewers were built in 1914, for a capacity of 48,000 cubic meters/day; by 1974 the system carried 1,250,000 cubic meters/day.⁶³ The sewage system in Alexandria, Egypt's second largest city, is similarly overtaxed. Lake Maryut is presently used as a holding tank for the wastes from the western and eastern districts of Alexandria. Central Alexandria's raw sewage is released directly into the Mediterranean Sea, and some of it has been washed back on the beaches, causing a public outcry. Alexandria's wastes include organic municipal wastes as well as 579 kilograms per day of heavy metals from industrial waste.⁶⁴

When wastes find their way into waterways, agricultural productivity and livestock health suffer as well. Because much Egyptian water use comes from the Nile, the effects of water pollution are sometimes multiplied for all subsequent users downstream.

AID, with assistance from the U.S. Environmental Protection Agency, has a major program to help Egypt rebuild its sanitation systems. The largest AID infrastructure projects in recent years have been in water and wastewater systems, which are also the highest priority in the government of Egypt's last two Five Year Plans. Since 1978 AID has committed over \$1 billion to rehabilitate and expand the water and waste water systems of Cairo and Alexandria; of the Canal cities of Ismailia, Suez, and Port Said; and of three provincial cities, Minia, Fayoum, and Beni Suef. The government of Egypt has also dramatically increased its investments in this area. Recent agreements have made U.S. assistance for the project conditional on institutional and financial reforms that will make the system financially viable. Parts of the project are complete and others continue. (AID has also funded some 2,000 drinking water projects and 311 sewage projects in rural areas.)⁶⁵

Air pollution has not received the same attention as waste water. Though regulatory legislation was introduced in 1971, it has not been enforced. Insufficient paving, heavy automobile traffic, a very dry climate, dust from the Mokattam Hills, and combustion products combine to produce high particulate

and chemical concentrations in urban areas.⁶⁶ The clouds of pollutants from the Helwan cement plant south of Cairo are legend. An October 1982 report on the plant found that pollution was the result of dust coming from old, inefficient furnaces that lacked appropriate filtering systems. Even those with electric filters broke frequently. Particulates in the air reduce solar radiation and contribute to a high rate of respiratory illnesses. The heavy daily coating of dust kills trees and plants downwind.⁶⁷

International Dimensions. A third class of environmental problems is international in source. The Mediterranean coast is polluted by releases from Egypt's neighbors, by passing tankers that flush their tanks (deballasting) in the Eastern Mediterranean, as well as by Egyptian coastal activities. The Mediterranean coast is polluted by Egyptian refineries and from transferring petroleum and oil from pipelines to tankers at Mars al Hamra and Sidi Kerir. However, most coastal pollution comes from the operational cleaning of tankers' holds in two areas approved by the International Maritime Organization (IMO) in the Eastern Mediterranean. Although banned by the new entered-into-force 1979 amendments to the 1973 IMO Dumping Convention, the practice continues because few ports have yet installed the costly reception facilities necessary for cleaning tanker holds. Coastal pollution threatens tourism, fishing, and the health of swimmers.

The Red Sea coastal tourist facilities, coral reefs, and fisheries are also potentially threatened by oil pollution in the open seas, and by sewage and waste disposal from neighboring countries. Oil pollution comes from tanker deballasting, the Egyptian oil fields at the Gulf of Suez (which, at 35 million metric tons in 1982, accounted for 1.3 percent of the world market), the Saudi Arabian oil processing and loading terminal at Yanbu al-Sinaiyah, and offshore exploration.⁶⁸

Pollution in the Mediterranean is covered by the 1976 Convention for the Protection of the Mediterranean Sea Against Pollution, the 1976 Protocol for the Prevention of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft, the 1976 Protocol Concerning Cooperation in Combating Pollution of the Mediterranean Sea by Oil and Other Harmful Substances in Cases of Emergency, and the 1980 Protocol for the Protection of the Mediterranean Sea Against Pollution from Land-Based Sources. Egypt has ratified all these treaties. Although not all the necessary central facilities in Mediterranean countries are yet completed, scientists think that the Mediterranean's quality has not declined significantly since 1977.

At the downstream end of the Nile, Egypt is heavily dependent upon Nile waters for irrigation, yet can only receive sufficient volumes if upstream states agree not to withdraw excessive amounts. Dependence on this lifeline complicates Egypt's relations not only with Sudan, but also with Ethiopia (source of the Blue Nile) and with Kenya and other nations surrounding Lake Victoria, from which the White Nile originates. Egypt shares the Nile with eight

other countries—all upstream. (See Figure 1.) In the past, Egyptian needs have dominated diversion of the waters—always with British help. Nile water is so important to Egypt that it has always been an essential part of her foreign policy to have a friendly government in Khartoum. The first Egypt-Sudan agreement was signed in 1929 when an Egyptian-British consortium ruled Sudan. With support from the United Kingdom, Egypt completed a highly favorable agreement with Sudan in 1959, after sending troops to the border. Egypt is guaranteed 55.5 billion cubic meters of water annually, and the Sudan is allowed to extract 18.5 billion.⁶⁹ A professionally staffed Permanent Joint Technical Commission set up under the 1959 treaty performs limited research, data gathering, planning, and coordinating functions. And it has facilitated cooperative efforts to finance and build the Jonglei Canal in southern Sudan—a project meant to increase water available to northern Sudan and Egypt.⁷⁰

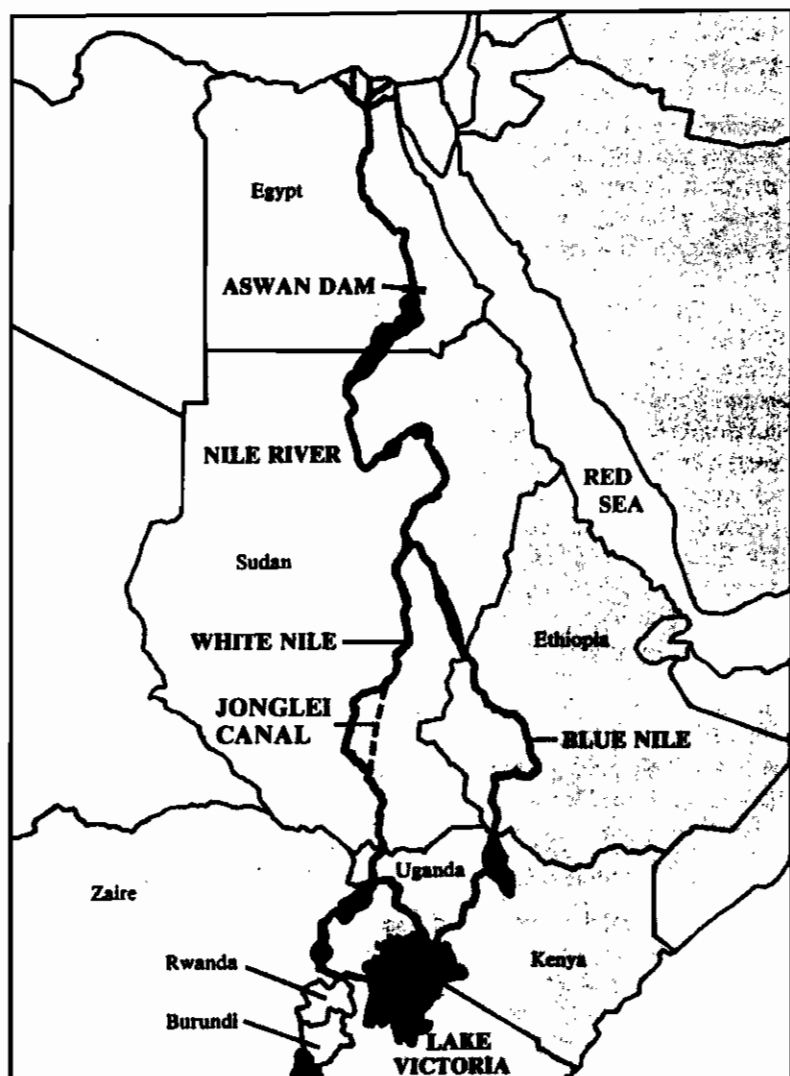
So far the bilateral arrangements seem to work well, though as Sudanese needs increase, competition for Nile water could create tension. There is already evidence of water deficits in the Sudan, although the 1988 floods have created other problems for the time being. So far the other upstream nations have not been taken into account in discussion of distribution of Nile water. At least 86 percent of the Blue Nile waters flow from Ethiopia—a point not lost on Ethiopia, which might one day want to divert some of that water for its own development purposes, though no projects are currently planned.⁷¹

The White Nile, which supplies the other 14 percent of Nile water, flows from Uganda, Kenya, Tanzania, Rwanda, Burundi, and Zaire. Today Egypt still oversees the outflow of water from Lake Victoria, more than 1,400 miles away from its own southern border. All these countries will one day lay claim to the Nile waters for their own hydropower and irrigation needs. The United Nations Environment Programme took an essential step in 1985 to bring these nations together for the first time to discuss joint needs. But sovereignty remains strong: none was willing to commit to any cooperative agreement that would limit its rights to control the Nile water in its territory.⁷²

Institutional Responses to Resource Security Issues

Although official Egyptian recognition of the need for population policy came as early as 1962, and the "plan", or National Population and Family Planning Policy, was developed for 1973–82, the 1978–82 Five Year Plan was the first to propose action programs. Earlier efforts relied on industrialization, reduction of infant mortality, improved social security and communications, and modest provision of family planning services, whereas the 1978–82 Plan boldly set a goal of reducing annual population growth from 2.31 percent in 1977 to 2.02 percent by 1987. Emphasis was now placed on establishing family planning centers throughout the country, especially in Upper Egypt (the south), where family size is highest, and on longer-term efforts to change basic socioeconomic

Figure 1. The Nile River



Source: From *World Resources 1987*, by the International Institute for Environment and Development and the World Resources Institute. Copyright © 1987 by the International Institute for Environment and Development and the World Resources Institute. Reprinted by permission of Basic Books, Inc., Publishers.

conditions in education, female employment, agricultural mechanization, etc. The plan also sought to move people to underutilized areas, to distribute the growing urban numbers to cities other than Cairo and Alexandria (largely through investment in housing), and to encourage international migration.⁷³

A new strategy was put forth by the Supreme Council for Population and Family Planning (SCPFP). It called for integrating family planning with basic health and welfare services and improved managerial capacity to deliver services at the local level. By October 1980, 70 percent of the rural population had such services. The program was supported by the United Nations Fund for Population Activities (UNFPA) from 1977, with AID joining in 1980. Beginning in fiscal year 1981/82 the Egyptian government also allocated \$4.3 million to the program.⁷⁴

In the Socio-Economic Development Five Year Plan 1980–84, the salience of the population problem was again underlined and a strategy developed to tackle it indirectly through increasing job opportunities, and by giving priority to food security, desert development, and housing. Five percent of the public investment budget was allotted to building population centers outside the narrow crowded strip along the Nile. While experts agree that both family planning services and improving the quality of life and expanding economic opportunities are essential to reducing fertility, in Egypt the health-based approach of the SCPFP and the Planning Ministry's concept of redistributing limited resources often seem competitive rather than collaborative.⁷⁵ The Five Year Plan 1987–88 to 1991–92 continues this dual approach, but heightens the importance of population, making "population and regional dimensions of development" one of three key "principles" of the Plan period, and once again the government set goals to reduce the natural increase from 2.8 percent in 1986–87 to 2.6 percent by 1991–92, and to 2.1 percent by 2001–02.⁷⁶

The SCPFP, chaired by the Minister of Health, oversees implementation of population policy, but the Ministries of Education, Social Affairs and Security, Agriculture Planning, Labour Force and Training, Culture and Information, and Youth and the census bureau all share some responsibility. Delivery of services is carried out by 3,942 units (in 1982) attached to the Ministry of Health and by 670 clinics of the Egyptian Family Planning Association and other voluntary organizations, largely funded by foreign donor agencies. These organizations use modern advertising and marketing techniques (including television, which is widely watched in urban areas) to promote birth control and sell subsidized contraceptives. Government agencies are often criticized as lagging behind private organizations, though it should be noted that the private agency activity is concentrated in urban areas that traditionally display greater receptivity to change.⁷⁷

The government has clearly succeeded in reducing the crude death rate, and has made some slight progress in fertility decline—from 6.56 births per woman during 1960–65 to 5.23 or even 4.8 during 1980–85, depending on which United

Nations estimates are used.⁷⁸ Contraceptives are used by about 30 percent of married women.⁷⁹ And the quality of life of Egyptians has markedly increased since the revolution thanks to post-revolutionary governments' commitment to equity, employment, education and health services, and, since 1973, thanks also to the large annual remittances returned by 3 million overseas Egyptian workers. Indeed, Egypt has a Physical Quality of Life Index that places her squarely in the middle of the range of Arab countries, despite a substantially lower per capita income.⁸⁰

But the population growth rate continues to hover somewhere above 2.5 percent per year, and the government's assumptions are that the population, estimated at 50.6 million in 1986/87, will reach nearly 70 million by 2000 (5 million more than the United Nations projects).⁸¹ Egypt simply does not have the luxury or the time to deal with growth at this pace without facing serious stress on the resource base and/or distinct deterioration of the quality of life. The lowering of fertility rates remains too slow to allow the government to keep ahead of the numbers.

Compared with his predecessors, President Mubarak is the most earnest supporter of population programs. He has spoken on occasion of the adverse effects of population expansion, including famine, unemployment, and terrorism. He has proclaimed population control a national priority. Nor does the connection between population growth and economics go unnoticed. President Mubarak put it bluntly: "We increase by about one million and a half each year....It threatens to choke all our efforts in all fields and quashes all hope of growth, production and development."⁸² He formed and chairs a new National Family Planning Council, supports the initiative of private organizations, but continues to live with a national program whose effectiveness is hampered by bureaucratic limitations. One senses in Egypt a continuing national concern about family planning that is also not fully organized to be entirely effective. And, on political grounds, the opposition includes family planning efforts high on their list of many issues on which they regularly attack the government.

Regarding environmental problems, in the last seven years Egypt has begun to respond with financial assistance from AID, the U.S. Environmental Protection Agency, and other donors. In 1981 a Ministerial Committee for Environmental Affairs was created by President Sadat. At the Committee's request, in 1982 the People's Assembly adopted Law Number 48 for Protecting the River Nile and Other Bodies of Water Against Pollution. This updated an unenforceable 1962 statute regulating pollution of the Nile. A license from the Ministry of Irrigation, after consulting the Ministry of Health, is required for disposal of wastes into the Nile and its tributaries from houses, shops and tourist centers, industrial and trade establishments, and sanitary drainage plants. A precise specification of wastes, tolerable limits, and recommended technologies remains to be drawn up. Further studies of the discharge of effluents through the

sewer system, of marine pollution by oil, and of radiation pollution are still under preparation.

In 1982 Directives were issued by the Minister of Industry and Mineral Wealth (Decree 385) and the Minister of Electricity and Energy (Decree 595) requiring both ministerial review of the availability of pollution control technology before construction and the retrofitting of all factories, power plants, and mines with pollution control equipment. The Prime Minister issued a directive stating that Environmental Impact Statements should be drawn up and reviewed before new industrial plants are built. The Minister of Agriculture and the Governors issued decrees on the protection of wildlife and the creation of national reserves. In 1983 the Ministry of Health issued a Directive (Decree 89) requiring the pharmaceutical industry to install pollution control filters in all factories. Evidence is not available on enforcement of these measures, or on follow-up efforts.

Decree Number 631 of 1982 created a new environmental agency within the Prime Minister's office. With a staff of 10, the agency is responsible for preparing draft environmental legislation, specifying environmental standards, and studying and analyzing environmental proposals submitted by other agencies. Its 1982-83 budget was \$8 million.⁸³

In January 1983 President Hosni Mubarak announced that water quality and sewage treatment was the number one national priority for the next five years. Egypt has committed itself to constructing sewage treatment facilities for Cairo and Alexandria. For the 1982-83 to 1986-87 Plan, Cairo sewage projects alone were estimated to cost in excess of two billion Egyptian pounds.⁸⁴ In addition to the AID contribution, the U.K. Overseas Development Administration has committed 50 million pounds, with another 100 million pounds on the way from private lenders. The Ministry of Industry's Environmental Project, a subsidiary of the AID-funded Industrial Production Project, has committed \$24.6 million for pollution control.⁸⁵

In the 1970s, following the rapid industrial and irrigation expansion of the Nasser years, Egyptian scientists became concerned about and documented the environmental effects of certain economic development programs. Their pressure led the government to develop institutions, policies, and laws to deal with the problems. Important changes have taken place in the last three years. Authority rests in the cabinet. Several ministers are knowledgeable about the issues and determined to figure out what needs to be done. A Cabinet commission chaired by the respected Mohamed Kassas led to the creation of the modest Department of Environment.

But looking at the record, and at budget allocations, it is clear that environmental concerns are not yet a priority commensurate with the mounting difficulties.⁸⁶ Concern is with conventional pollution issues, and the government wants AID to give more hardware and technical assistance—to help with monitoring and control technologies. Agricultural practices are not really

included as a priority concern, nor are the environmental consequences of energy use, and the connections are not being made among drinking water, pollution, irrigation, and health problems. In addition, the responsible agencies are understaffed and underfunded.

Conclusions

The hard irony of Egypt's plight is that the interests that pose a political challenge to the Mubarak regime—that is, dissatisfaction within the military and domestic instability—in dealing with the nation's growing population pressures on limited natural resources. The military's concerns lie in continued large military assistance from the United States, the development of a lucrative arms export business outside the control of the national budget, and forgiveness of military debt by the United States. Various political factions, including the fundamentalists, do not support birth control, and their economic and social agenda demonstrates no support for the policy, price, and technological changes the government will have to make to achieve sustainable development.

The government needs to deal with the severe environmental degradation and population growth threatening resource security, and to devote more resources to address other problems. And popular concern about resource security considerations—cushioned thus far by policies of social equity, a vigorous informal sector of the economy, and remittances worth several times the value of export earnings—has not yet developed a countervailing support for the necessary measures.

Resource degradation, population pressures, and pollution are accelerating and converging in Egypt. The question is, of course, whether the nation can count in the future on the outlets that have up till now reduced the resulting strains. Can the Mubarak and subsequent governments provide jobs for more than 400,000 entering the work force each year, and provide housing and health care for another 20 million who will be added to the population by the end of the century? Can the government meet the expectations of a greatly expanded population for continued subsidies—which are already estimated at \$7 billion a year? Can the Arab oil-producing states absorb twice again as many Egyptian workers, especially if they may not be as well educated as in the past? Will adequate supplies of oil be discovered in the Western deserts? Can the private sector, including the informal sector, expand and assume a greater economic role?

Some of the answers to these problems are internal, and some answers lie outside Egypt. What happens with respect to overseas employment, oil prices and foreign assistance will affect Egypt's ability to respond to resource security demands. Increased reliance on foreign sources of supply, although improving the immediate political security pressures on the government, makes the government vulnerable to longer-term uncertainties of market and political

influences. This vulnerability may at times even threaten the government's own conception of sovereignty.

Other answers lie at home. More-efficient pricing policies by the Egyptian government might stimulate domestic agricultural and energy production, although at the risk of triggering urban political resentment and further challenges to political security.

In short, threats to resource security may be resolved through a number of policy responses, at some political cost. But focusing exclusively on the political security exposes Egypt to much more severe long term resource security crises.

The future of Egypt's overall national security rests upon the careful balancing of these different challenges. It depends also on giving more attention to the sustainability of its underlying resource base.

U.S. Policy Toward Egypt

The United States should recognize its political interests for what they are—important to all U.S. relations with the Middle East—and think of the Economic Support Funds and development assistance given to Egypt not as a typical collection of AID projects, but as a political insurance payment. Egypt has thousands of underemployed educators, scientists, and engineers and does not require U.S. technical assistance except in a few rare areas of expertise. Washington should therefore give Egypt the money outright, as it does to Israel, and dismantle Cairo's large AID mission.⁴⁷ This would reduce U.S. visibility and blunt the anti-American accusations raised against the Mubarak regime.

Then the United States should, as far as possible, leverage its generous contributions to the Egyptian treasury and urge Egypt on to a more sustainable road to development. Recognizing the importance of resource security to military and political security, the United States should use its access to top Egyptian leaders to affect macro-economic and development decisions—to step up the restoration and conservation of soil, to improve the productivity of small farms, to rationally control the use of pesticides, to tackle urban pollution, to lower the subsidies of energy and water. Egypt is beginning to make some progress along all these lines. It deserves support, encouragement, even pressure to do more. Such policy efforts must, of course, be coordinated with those of the International Monetary Fund and the World Bank. But there, too, the United States—being more conscious than those institutions of the importance of resource security—should use its influence to heighten the importance of the policies that affect resource management.

The United States cannot, of course, tell the Mubarak or any other Egyptian government what to do. But it should continue in all its relations with Egypt to emphasize mutual interests in respect for the resource base and the population/resources balances. A high profile posture is invariably dangerous and can potentially backfire, as we have seen elsewhere in the Middle East and

in other parts of the world. Supporting Egyptian development means, in the last analysis, adopting policies and postures that would reinforce (or buttress) rather than threaten (or undermine) the country's overall security—in all its interconnected dimensions. The goal of U.S. policy should be to use persuasion and leverage, to be supportive with a low profile, to help shape Egyptian development policies in ways that ensure all three components of national security.

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86. President Mubarak's national priorities are thought to be the maintenance of internal security, domestic political stability (including restraint of the political opposition), protection of important new institutions (the Parliament and Shura, the new supreme court), and energy production.
87. This recommendation remains controversial, given the fact that USAID activities in Egypt have been central to public policy measures in the environmental area and have sensitized the Egyptian government to respond appropriately.