15.3   Economic Activities

15.3.1   Gross Domestic Product

1)   Economic Performance

After the start of the open door economic policy in 1974, an economic growth was accelerated to average more than 9% for the second half of the decade. The real growth of gross domestic product (GDP) kept high performance but gradually declined for the 1980's. In the first half-decade of the 1980's, it recorded around 8% on average. In the second half-decade, however, it was less than 5% according to the International Monetary Fund (IMF) recording an annual average of GDP. Performance since the 1990's has been erratic because of the 1990/91 Gulf crisis and structural adjustment. Thus, the real growth slowed down to 2.4% in 1990/91 and 2.0% in 1991/92 with the IMF records.

Egyptian government introduced an economic reform policy to stabilise the macro-economy and accepted the recommendation of IMF and the World Bank, "Economic Reform and Structural Adjustment Program (ERSAP)" from 1990 to mid-1993. The economic reform has proved successful and performed the modest real growth of GDP, i.e., 2.5% in 1992/93 and 3.6% in 1993/94.

GDP in Egypt was LE 225 billion in the fiscal year 1995/96, as shown in Table 15.3.1-1. It is broken down into gross value added (GVA) of economic sectors in the same table. Their percentage distribution is shown in Table 15.3.1-2. They are summarised as follows: LE 110 billion in the commodity sectors or 50% of GDP, LE 74 billion or 33% in the production services sectors and LE 38 billion or 17% in the social services sectors. In the commodity sectors, the agricultural sector performed around LE 39 billion of GVA or 17% of GDP in the same fiscal year. In the same manner, the industrial and mining sector completed LE 40 billion or 18%. The petroleum and its products sector attained LE 16 billion or 7%. Per capita GDP was LE 3,840, equivalent to approximately US$1,130, as shown in Table 15.3.1-1.

Table 15.3.1-3 shows GDP by economic sector at 1991/92 constant prices between 1991/92 and 1995/6. For these five years, GDP increased from LE 131 billion to LE 153 billion in real terms. It grew at the low rate of 2.5% in 1992/93 and at high rate of 4.9% in 1995/96 as shown in Table 15.3.1-4, or an average growth rate of 4.0% per annum between 1991/92 and 1995/96. The commodity sectors grew at 4.0% on average for four years. The major sectors attained the following GVA growth for the four years on average: 3.1% in the agricultural sector; 5.5% in the industrial and mining sector; and 2.5% in the petroleum and its products sector. Per capita GDP grew at the row rate of

0.4% in 1992/93 and at the high rate of 2.8% in 1995/96, or an average growth rate of 1.9% for the four years.

2) New Five-year Plan

In 1997, the government published "The Fourth Five-year Plan of Economic and Social Development (1997/98-2001/02). It proposes the economic prospect for the planning period. The real economic growth is expected to grow at a rate of 6.9% per annum on average. Table 15.7.3-5 shows the economic sectoral distribution as well as GDP. The respective major sectors will grow at the following average annual rate: 7.3% of the commodity sectors; 7.5% of production services sectors; and 4.8% of the social services sectors.

In the report of "Recent Economic Development and Statistics, October 1997, MOE", IMF projects GDP of Egypt as shown in Table 15.3.1-6. The average growth rate at real terms during the same period as the above five-year plan is as follows: 5.4% in the first year of 1997/98 and 6.8% in the final year of 2001/02. It is somewhat conservative as compared with the proposal in the national plan. It is calculated at 6.0% per annum on average.

15.3.2 Agriculture

The agricultural production is the most basic economic activity and plays an effective and tangible role in local development as well as in national development. South Sinai Governorate is considered to have some development potentials for increasing cultivated land, livestock and fish production owing to available natural resources such as land and water resources. In the Sinai Development Plan, South Sinai is expected to bear more agricultural lands by means of development of groundwater and runoff water including the construction of dams and dykes.

1) Crop production

In South Sinai, the total amount of cultivated land area was approximately 14,000 feddan (about 6,000 ha) in 1993. They are distributed in El Qaa Plain, Wadi Feiran, Ras Sudr and Nuweiba. Most of them are under rainfed agriculture under intermittent cultivation. Besides, some small areas are cultivated also under intermittent condition in scattered wadi beds. Sparse rainfall supports about 650,000 trees of date palms in South Sinai Governorate. Moreover, traditional crops are fruit and vegetables such as tomatoes, onions, watermelons, potatoes, squash, cucumbers, melons, green peppers, beans, cauliflower, cabbage, carrots, spinach, lettuce, eggplant, okra, garlic, globe artichokes, cow peas, broad beans, olives and oilseed crops. Their production is not stable due to

sparse rainfall.

According to the latest information regarding crop production through South Sinai Office of WRRI, the major crops cultivated in South Sinai are classified into cereals, fruits, vegetables and palm trees. For production of these crops, they have no cropping calendar because of climate. In other words, they produce these crops under intermittent cultivation. The annual production of these crops is summarised as follows.

(1) Cereal Crops

In the governorate, wheat and barley are cultivated in every season. Wheat production was recorded for the latest five years as shown in the table below. The production was not steady as shown in the table, because of cultivation system and natural conditions. An average yield is calculated at 1.16 tons/feddan. This yield is considerably low, since the national average is around 2.25 tons/feddan. A wholesale price of wheat was reported as LE100 per ardeb (LE720 per ton) in South Sinai in 1998.

Year	Cultivated Area (feddan)	Production (tons)	Yield (tons/feddan)
1993	3,795	4,071	1.07
1994	814	575	0.71
1995	4,427	7,245	1.63
1996	156	242	1.55
1997	251	217	0.86

In 1997 barley production was 277 tons in 423 feddan of cultivated area. The yield of barley is calculated at 0.65 tons/feddan. This yield is also low, because the national average yield is reported as 1.1 tons/feddan. A wholesale price was LE60 per ardeb (LE430 per ton) in 1998.

(2) Fruits

South Sinai Governorate had 5,562 feddan of fruit gardens in 1997. In the gardens, the farmers produced olive, orange, apple, banana, and other fruits. For the latest five years, olive was produced as follows: 2,315 tons in 1993, 869 tons in 1994, 2,472 tons in 1995, 873 tons in 1996 and 2,641 tons in 1997. In 1997, the number of productive olive trees was counted as 67,761. A wholesale price of olive was reported as LE1,500 per ton in 1998.

(3) Vegetables

The governorate recorded 198 feddan of cultivated lands for vegetable production in

1997. The report shows that the following vegetables were produced in the lands: tomato, watermelon, zucchini and cucumber.

(4) Palm Trees

There were 63,249 palm trees in the governorate in 1997. Of the total, however, only 19,010 trees were productive and the rest of 44,239 trees were not productive. As mentioned in the first paragraph in this section, the date palm was reported to be 650,000 trees in 1993. The reasons of this big difference are not clear as far as the report states.

2) Livestock Production

The livestock production is traditionally very important for Sinai. Camel, goat and sheep produce milk, meat, fibre, hide, and in the case of camel, provide means of transportation. In 1981, the livestock population was enumerated at around 79,300 in South Sinai Governorate, broken down as follows: 12,700 heads of sheep; 44,900 heads of goat; 16,300 heads of camel; 5,100 heads of donkey; and 300 heads of horse. In 1993, the livestock population was recorded to remain at almost the same level of 78,000 heads in total. The livestock sector still has considerable potential for improvement in Sinai. Main points for improvement are: meagre ranch resources; overgrazing in the communal lands; low reproduction rate; and several endemic diseases.

3) Fishery Production

In 1993, Egypt landed 51,000 tons of fish from the Red Sea (almost all from the Gulf of Suez). Almost all of this fishing is conducted out of the Port of Suez. According to the Sinai Development Plan, the total fish production in both North and South Sinai areas was approximately 3,600 tons in total, which includes the production from Mediterranean strip and Al Bardawil Lake in North Sinai and from Gulf of Suez and Gulf of Aqaba in South Sinai. In South Sinai Governorate, however, its production was considerably small. This is because appropriate port facilities and vessels are lacking in the coastlines of South Sinai Governorate, despite favourable conditions of a great saving in time fuel for marine fishing in the Red Sea. There are no aquaculture facilities in South Sinai, although they are popular in North Sinai.

15.3.3 Mining

The petroleum sector is the most lucrative in the Sinai Peninsula. Crude oil is produced by Public Petroleum Company and private Petrobel Company. Besides oil, the Sinai Peninsula has numerous areas of known mineral potential. In South Sinai Governorate,

the following important mineral deposits are reported. In the governorate, there are two public mining companies, which are located in El Tur and in Abu Zenima.

(1)   Kaolin, mined at the east of Abu Zenima and Abu Rudeis.

(2)   Manganese, at Umm Bugma (about 200 km north east of Abu Rudeis).

(3)   Copper, mined in several locations in southern parts of South Sinai Governorate.

(4)   Coal, at north east of Abu Zenima and near Umm Bugma

(5)   Albite, at Wadi El Ter (north of Sharm El Sheikh), etc.

(6)   Albantonite, reserved between Ras Sudr and Ayun Musa.

(7)   Turquoise, mined near Umm Bugma.

Following materials are used for building and construction purposes. They are also used as raw materials for masonry.

(1)   Gypsum, along seashore near Ras Malaab between Abu Zenima and Ras Sudr.

(2)   Limestone, in many location in South Sinai.

(3)   Clay, sand and pebble soil, in all over South Sinai.

(4)   Ornamental stones such as granite, marble and alabaster, along south-west of Aqaba Gulf and south-east of Suez Gulf and in St. Catherine.

15.3.4   Industry

The industrial sector in South Sinai is still very limited, although it has a high industrial development potential owing to mineral resources. According to Statistical Data Book of South Sinai Governorate, there were only 60 manufacturing establishments in 1996, as shown in Table 15.3.4-1. Of the total 60 establishments, 23 establishments or 38% were classified into petroleum industry. There was a small oil refinery factory on Wadi Feiran. In 1995, it produced a capacity estimated at 400,000 tons. Following to the petroleum industry, 20 establishments or 33% produced food products. Others were classified in the fields of (1) building material production, (2) mechanical and electrical appliance production and (3) mineral products.

Of the total 60 manufacturing establishments, 36 establishments or 60% are small industries with less than 10 employees, all of which are managed privately, as shown in Table 15.3.4-2. The number of establishments having more than 100 employees is 12 factories or 20% of the total number. Among them, only two establishments or 3% of the total number employ more than 500 workers. The government manages one of them, and the other is in semi-public management.

Table 15.3.4-3 shows the growth of Sinai Manganese Refinery during the latest five years. Its production increased from LE 9.2 million in 1991 to LE 73.5 million in 1995, almost eight times for the five years. Exports of the products grew at the high pace as shown in

the table. They increased from LE 0.3 million in 1991 to LE 39.0 million 1995, 124 time for the five years.

15.3.5   Tourism

South Sinai Governorate has a wide range of tourism resources. They are classified into the following three types:

(1) Recreational tourism, of which the tourist spots extend along the coast of South Sinai Governorate.

Coast of Ras Mohammed National Park

Gulf of Aqaba coasts, such as Sharm El Sheikh, Dahab, Nuweiba, Salah El Din Gulf and Phaoahs Island.

Gulf of Suez coasts, such as Ras Sudr, Ras Matarma and El Tur.

St. Catherine and its surrounding areas for mountain climbing and camping.

Deserts in central Sinai for desert safari tourism.

(2) Cultural and religious tourism, which is developed in archaeological and historical spots. South Sinai Governorate includes areas with scattered monuments dating from pre-historic ages, Pharaonic archaeological sites and religious sites such as St. Catherine monastery, Gebel Musa and the shrines of the prophets.

(3) Scientific tourism, including the studies of flora and fauna in St. Catherine and Ras Mohammed National Park. Tourists can enjoy wild life and marine life with birds, animals, fish, plants and coral reefs in these sites. These tourist resources also attract scientists, researchers and scientific tourists.

Despite the above tourism potentials, the present tourism is limited to the seaside recreational tourism and the religious tourism in St. Catherine. In particular, the seaside recreational tourism along the Gulf of Aqaba coast attracts international tourists interested in water sports during the whole year. In fact, it increases the arrival number of international tourists as well as local people year by year. The number of tourists to South Sinai Governorate reached 1.55 million tourist nights in 1995 and 2.55 million in 1996. Since it was 1.00 million tourist nights in 1993, the number in 1996 increased 1.55 million tourist nights or 155% more than that in 1993 for the two years. In 1995, there were 26 hotels with an accommodation capacity 10,436 rooms. Then, an average hotel occupancy rate was 67% in 1996. The accommodation for tourists was distributed in six cities as

listed in Table 15.3.5-1, although the inventory data of accommodation in 1992/93 were somewhat older than that above in 1996. According to the 1992/93 tourism information, an average period of tourist was 2.8 night per capita in South Sinai Governorate.

15.3.6   Foreign Trade

Exports in Egypt traditionally used to rely heavily on cotton only. After petroleum oil became an export item in the latter half of 1970's, it has been the largest export item in monetary terms in Egypt. The export of petroleum oil is easily influenced by market price. In 1986, a sharp decline of oil price in the world market made the oil export of the country fall down. On the other hand, consumption of oil in domestic market increased in proportion to a growth of industrial production. Thus, dependence on oil export has declined gradually. Instead of oil export, the government has encouraged the exportation of domestic industrial products since 1987. Accordingly, the items of export have diversified year by year, as shown in Table 15.3.6-1.

Since 1974, imports of consumer products have substantially increased due to open market policy of the government. As shown in Table 15.3.6-2, many food items occupied big shares among all import commodities. In 1996, all food products accounted for LE 13.2 billion or 30% of the total import amount. Among food items, wheat had the largest share as shown in the table. Following to foods, the transport products related to motor vehicles listed in items 7, 8 and 9 in the table had the second largest share in import items. Besides, chemical products, construction machinery and metal products are succeeding.

Major trading partners for export in 1995 were Italy, USA, Germany, UK and Rumania in order of monetary terms, as shown in Table 15.3.6-3. Trade with these five countries accounted for LE 2.6 billion or 15% of the total export. Italy has been an important partner for Egypt, which kept the largest share in monetary terms as shown in the table. Italy has imported much crude oil from Egypt.

In terms of import, USA has kept the top position for long time as shown in Table 15.3.6-4, since USA gave high priority to food assistance to Egypt. Germany has kept the second position for the recent few years. Italy, France, Japan and UK followed them, as shown in the table.

15.3.7   Inflation and Prices

Statistics on prices play an important role in the study and for analysis of economic activities. The movements of prices are used to adjust wage rates, taxes and a variety of other transaction flows. Price level changes are closely monitored in an economy because they are used to measure inflation.

Table 15.3.7-1 shows price indices from the year 1985 to 1997 covering not only retail prices but also wholesale prices. The consumer price indices were selected in rural areas and the wholesale price indices were counted on the whole country bases. The consumer price index increased from 74.8 (base: 1986/87=100) in 1985 to 354.6 in November 1997, up by about 474% in the past twelve years. In the same way, the wholesale price index increased from 487.8 (base: 1965/66=100) in 1985 to 365.8 (base: 1986/87=100) in September 1997, up by about 456% in the twelve years.

Table 15.3.7-2 shows the foreign exchange rate of LE per US$ from 1985 to 1997 at the end of each period and the annual average. Up to the year 1991, the government introduced a multiple exchange rate system. It consisted of three rates: (1) the primary rate, a fixed rate of CBE; (2) the secondary rate, a fixed 'special' rate; and (3) the tertiary rate, a free banks' rate for remittances and tourists, which was set daily by a committee composed of representatives from authorised banks dealing in foreign and local currencies. The primary rate was used officially. As seen in the table, the value of LE dropped down from LE 0.70 per US$ in 1985 to LE 3.39 in November 1997. Since the end of 1994, the rate of LE3.39 has kept the same level, as shown in the table.

15.4   Infrastructure

15.4.1   Transportation

Egypt has a well-developed road system following an extensive modernisation and expansion programme in the 1980's. In South Sinai Governorate, there was 1,761 km of paved roads in 1995. This meant 20 inhabitants per km of paved roads, which is the largest density among 26 governorates in the country. The network of paved roads is classified into a national network administered by the Ministry of Transport (Roads and Bridges Authority or RBA), and a local network administered by local authorities.

For the two decades between 1972 and 1992, 2,670 km of paved roads was constructed throughout the Sinai Peninsula, which were administered by RBA. Table 15.4.1-1 shows an inventory of these 11 roads. Of these 11 roads, one road (Mafraq El Tur - St. Catherine - Dahab Nuweiba crossroads) is completely included South Sinai Governorate. Some parts of two roads belong to South Sinai Governorate, which are (1) El Qantara East - Ras Mohammed - El Nakab and (2) Ras Sudr - Baloza.

South Sinai is well endowed with air transport system. There are nine airports in the governorate. They are: El Tur, Ras Sudr, Ras Matarma, Abu Zenima, Abu Rudeis, Mafraq El Tur, Sharm El Sheikh, St. Catherine and Nuweiba. Air system operates frequent services to the tourist resorts in the Gulf of Aqaba.

There were few port facilities in the past in South Sinai. The access from land to sea and sea to land was from the beaches or from small piers. At present, protected harbour facilities with ancillary facilities on shore are installed at El Tur, Abu Zenima, Abu Rudeis and Sharm El Sheikh. In particular, El Tur port is planned to function as an international port for international tourists coming to visit South Sinai tourist spots such as St. Catherine.

15.4.2 Electricity

The electric power loads onto the respective power stations in South Sinai Governorate were 20.1 MW in 1993/94. The loads were distributed as shown in Table 15.4.2-1. The loads in Sharm El Sheikh recorded the largest (12.5 MW) among the existing power plants. The power plants were located in six cities in the same year, as shown in the table. The total maximum capacity of electric generation was 82.4 MW. Thus, it still seems to have power capacity enough to cover the future increasing power demand. However, a durable supply system is needed, since the power loads are distributed among isolated areas separated by long distance. Therefore, each of power plants must be installed with sufficient capacity to meet full loads. It also must have a reserve to face emergency and maintenance.

In 1996, the total power consumption in South Sinai Governorate was recorded at 17,280 MWh per annum. This means a per capita consumption rate of electric power was around 317 KWh per annum, since the population was estimated at 54,495 in the 1996 census.

The electric power was distributed and transformed through the following electricity networks in South Sinai Governorate:

(1) 22 KV link between Abu Rudeis and Abu Zenima.

(2) Aerial lines and underground cables of 22 KV to serve the distribution boards in the towns of the governorate.

(3) Aerial lines and underground cables of 400 V to serve towns and the step down transformer substation from 22 KV to 400 V.

(4) Internal networks for Bedouin communities in the governorate.

15.4.3 Water Supply and Sewerage

Potable water is a key factor in settlement in the Sinai Peninsula. The Nile River is considered a main source of potable water in the peninsula. At present the water reached to El Tur from Suez via pipeline of 600-mm diameter. It is being extended to Sharm El

Sheikh. Subsidiary pumping stations are installed along the pipeline to ensure that water reaches its destination with the required quantity and pressure.

Table 15.4.3-1 shows the water supply and sewage treatment situation in South Sinai Governorate in 1993/94. The potable water demand was estimated at 5,640 m³/day, as shown in the table. On the other hand, the existing capacity of water supply was 5,500 m³/day. Thus, 140 m³/day of potable water was deficit. This shortage was partly overcome by artesian stations and small portable filtration units using well water. In the same manner, about 500 m³/day of sewage treatment capacity was deficit in total, as shown in the table.

According to the Statistical Data Book of the South Sinai Governorate, the total water demand for all consumers was estimated at 17,400 m³/day in total in 1996, as shown in Table 15.4.3-2. On the other hand, the existing production capacity of water supply was 18,400 m³/day. Thus, around 1,000 m³/day of potable water was surplus. In four cities, however, the supply capacity was insufficient as shown in the table. They were Nuweiba, St. Catherine, Abu Rudeis and Abu Zenima in order of deficit volume.

The total water demand was distributed as 4,700 m³/day for residents in eight cities including communities, 5,900 for tourists coming into six cities and 6,600 m³/day mainly for industrial purposes. Since the number of residents and tourists was estimated at 39,000 and 14,700 in 1996 respectively, the unit consumption rates were calculated as 120 lit/capita/day for residents and 400 lit/capita/day. These rates are the reason of big difference in water demand shown in Table 15.4.3-1 (5,640 m³/day in 1993/94) and Table 15.4.3-2 (17,200 m³/day in 1996).

15.4.4 Telecommunication

The total number of existing post offices was 72 in North and South Sinai Governorates. Of the total, 49 public offices were managed by the national government and 23 offices were managed by private mail agencies. The number of workers engaged in postal services was registered as 353 in 1993. Of these workers, 229 were in North Sinai and 124 were in South Sinai. In 1996, there were 17 post offices in South Sinai Governorate, according to the Internet information.

The telephone service is not adequate for modern business and administrative requirements. Each city is linked to the national telephone networks. The telephone exchange has reformed into automatic system even in South Sinai Governorate. According to "Sinai Development Study, Phase I", a capacity of exchange lines was 3,000 in both cities of Abu Rudeis and Ras Sudr. The telephone exchange system has been

improved abruptly in settlement program in South Sinai. In 1996, then, the telephone exchange lines increased to 14,200 in South Sinai Governorate, according to the Internet information.

15.4.5 Education

An education system in Egypt comprises four stages of school in general. They are: 6 years of primary school; 3 years of preparatory school; 3 years of secondary school; and 4 years of university. A pupil enters into a primary school at 6 years old. All stages of public education system are free of charge for Egyptians in Egypt.

As of school year 1995/96, the number of school classes of pre-university education and their enrolment in South Sinai Governorate was recorded as follows. Hence, the pre-university education includes primary, preparatory and secondary levels:

Item	General	Al-Azhar*1	Total
Number of Classroom	491	93	584
Number of Students	9,032	1,064	10,096

Note: *1 Education system based on Islamic doctrine.

The average number of students per class was 17 in pre-university education, since the number of students was 10,096 and the number of classes was 584 in total. This rate was the smallest in the country. Incidentally, the average of the country was 41 students per class in the same school year.

In terms of high education, there is one institute in South Sinai Governorate in 1995. It had an enrolment of 1,056 students.

15.4.6 Health

In 1996, there were nine hospitals in total in South Sinai Governorate. The hospitals had 104 physicians and 333 beds. The bed capacity rate of hospital was 6.1 beds for 1000 population. In the same year, the national average rate of the bed capacity was 2.0 beds for 1000 population. The level of the bed capacity rate in South Sinai was considerably higher than that of the country. Then, the governorate's average is already over the recommendable level of 5 beds per 1000 people by WHO.

Bilharziasis disease, which is one of the most popular endemic diseases in Egypt, was recorded in South Sinai Governorate in the recent five years, as shown in Table 15.4.6-1. In 1995, 3,931 patients of bilharziasis disease were recorded in the governorate. Among them, 2,139 patients were suffered through urine and the rest was through stool.

The government believes that the current rate of population growth is too high. Thus, the government promotes the family planning policy. In South Sinai Governorate, there are 15 health centre units for family planning, as shown in the table. In 1995, the number of women, who were in the age bracket (20 to 45) of giving birth to baby, was 8,415. Among them, the number of women who accepted the family planning policy was 764 or around 9% of the total.

15.5   Financial Situation

15.5.1   Public Finance

The government has a chronic financial deficit problem for long time. In order to reduce this deficit, the government makes all possible efforts. It conducted an overall review of expenditure items, in particular subsidy cuts to reduce public expenditures. It also conducted tax reform including sales tax and energy tax to increase public revenues. Furthermore, it undertook the fiscal liberalisation, such as removing the nominal ceilings on interest rates and foreign exchange controls for allowing unrestricted international capital mobility. Besides them, it has freed the prices of almost all-industrial products, removed almost all non-tariff barriers for promotion of external trades, and promoted privatisation for leading the government's reform agenda.

In fact the fiscal deficit has been reduced owing to the economic reform. The deficit was LE17.0 billion in 1990/91. It went down to LE 6.2 billion in 1991/92 and to LE2.5 billion in 1994/95 as shown in Table 15.5.1-1, although it showed slightly to go up to LE3.0 billion in 1995/96. In expenditure side, the subsidies decreased from LE7.2 billion in 1991/92 to LE3.3 billion in 1993/94 or down to less than a half for the two years, although afterwards it was reversed gradually to go up to LE4.3 billion in 1995/96. In the revenue side, the tax coverage ratio against the total expenditures has been increased from 51% in 1991/92 to 60% in 1995/96.

The state budget has been set up with an aim of lowering the overall deficit, as seen in the previous section. The fiscal deficit could be verified through its ratio to GDP. As a result, the ratio was reduced from 4.7% in 1991/92 to 1.3% in 1995/96, as shown in the below table. In the same manner, the ratio of expenditure to GDP also decreased from 36% in 1991/92 to 28% in 1995/96.

					(Unit: LE Billion)
Item	1991/92	1992/93	1993/94	1994/95	1995/96
GDP	131.1	146.2	163.0	191.0	225.3
Expenditure	47.6	52.2	56.3	58.3	63.9
Ratio to GDP	36%	36%	35%	30%	28%
Deficit	6.2	5.5	3.7	2.5	3.0
Ratio to GDP	4.7%	3.8%	2.3%	1.3%	1.3%

15.5.2   Balance of Payment

Egypt used to have large deficits on the current account. Since 1990, however, it has recorded its current account surplus, despite the large trade deficit, as shown in Table 15.5.2-1. The main factors of this surplus were large inflows on the export of services and positive net transfers. The large parts of these services mainly consist of tourism as well as Suez Canal earnings. The net public transfer has kept high level traditionally. This is because the high level of gross development assistance from OECD and OPEC member countries, although the level is declining these years. The continuing strength of remittances from expatriate workers, however, has offset the declining public transfer to keep the net transfer high.

The government promotes foreign investment in Egypt and revised the investment law in 1989. In 1992, it announced further promotion policies to attract additional foreign investment. Thus, the direct investment increases gradually as seen in the table. Besides, the total inflows of loans have decreased for these years although Egypt was one of the most heavily indebted countries in the Arab world. Egypt's debt to private creditors remains small. Anyhow, the amortisation is still heavy for the capital balance. As a result, the country has kept the capital-account deficit as shown in the table. Accordingly, Egypt has not been stable in balance of payment.

15.5.3   Foreign Assistance and Debt

Gross receipts of official development assistance (ODA) from OECD, Arab countries and multilateral agencies aggregated to US$ 16.5 billion for the recent four years and averaged US$4.1 billion per year between 1990 and 1994. The receipts fluctuate year by year sharply as shown in Table 15.5.3-1. This fluctuation was caused by USA's bilateral aid in particular.

An average annual receipt of ODA accounted for approximately 26% of an annual expenditure of the governments on average in the same period. It ranged from maximum 36% in 1991 and minimum 14% in 1994 as shown in the below table.

				(Unit: US$ Billion)
Item	1991	1992	1993	1994
Receipt of ODA	5.0	3.6	2.4	2.7
Expenditure of Governments	15.2	15.7	16.8	17.2
Share of ODA (%)	36	32	21	14

In 1994, the total external debt was US$ 33 billion as shown in Table 15.5.3-2, accounting for 59% of GDP (approximately US$56 billion equivalent). In 1995, the outstanding of long-term debt was US$32 billion. The total debt-service was US$2.4 billion, comprising US$1.0 billion of principal repayment and US$1.4 billion of interest payment. Thus, the debt-service ratio decreased to 15% in 1994 from 23% in 1990.

15.6 Outline of Sinai Development Project

15.6.1 Background of Project

In all economic and social development plans, the government have proposed to establish the bases for balanced and stable development in the whole country. The bases should be reasonable from the viewpoint of both international and regional development, as well. In the plans, the development covers the major economic sectors such as agriculture, mining, manufacturing and tourism in the regions where resources are available. It also provides employment opportunities for human resources.

In order to face the problem of population growth in the country, the plans propose to redistribute the growing population throughout the whole Egypt through the creation of new cities in the selected regions. This is considered as an important measure against the problem whereby 98% of the population lives in the narrow strip land of the Nile Valley having less than 5% of the total territory of Egypt.

The plans give the top priority for the development to the Sinai Peninsula. It is placed as the most important region for Egypt due to its historical, current and potential background. In fact, the peninsula is the link between two continents, as well as a link between Egypt and the Arab World. Besides, it has prosperous natural resources allowing the development of tourism, mining, manufacturing and agriculture as leading sectors. The development would attract and support the growing population and labour force.

For the last decade, various international organisations, foreign countries and domestic agencies conducted many kinds of studies and researches in the Sinai Peninsula. "The National Project for the Development of Sinai" was compiled on the basis of the fruits of these studies and researches. The project is a stage by stage plan that begins with the third five-year plan 1992-1997 and continues to the year 2017.

15.6.2   Industrial Development

The goal and objectives of the Sinai Development are to attain self-sufficiency in the region and to bring up export industries by making the most of the Sinai's geographical advantage and natural resources. The spatial industrial strategy is specialised as agriculture in the North, mining and manufacturing in the South-West, and tourism in the South-East.

1)   Agriculture

In 1994, the total cultivated land area in South Sinai Governorate was estimated at approximately 1,500 feddan (630 ha). By the target year 2017, it is expected to increase to 36,000 feddan (15,120 ha) or 24 times of the area in 1994. The water resources for these newly reclaimed lands would rely on groundwater and runoff water by applying dams and dykes.

The project proposes to develop the natural pasturelands for conservation of vegetation and for livestock grazing. By 2017, it will cover an area of 0.3 million feddan (1,260 km^2) in the Sinai Peninsula. Based on livestock and poultry development owing to the developed natural pasturelands, it promotes the projects of meat and dairy products in the peninsula, as well.

Regarding coastal fishery, the project aims at increasing the production along the Gulf of Suez and the Gulf of Aqaba to 15 million tons annually. It includes the development of the fishing ports at El Tur, Ras Sudr, Abu Zenima and Dahab.

2)   Mining

The oil production is one of the most important industries in the Sinai Peninsula. Crude oil in Sinai was exploited at the volume of 1.8 million barrels in 1993/94 from the fields of the Public Petroleum Company and PETROBEL Company. The reserve in the fields is estimated at 237 million barrels of crude oil and gases.

There are rich areas of mineral resources in South Sinai Governorate. These resources would eventually lead to increase the national economy and to create job opportunities in the governorate. The following table shows some of the most important mining ores and their reserves estimated in South Sinai so far.

Mineral Resource	Producing Area	Estimated Reserve
Kaolin	Abu Zenima, Abu Rudeis	100 million tons
Manganese	Umm Bugma	-
Copper	Sarabeit, Abu Suweira, etc.	-
Coal	Abu Zenima, etc.	75 million tons
Albite	Wadi El Ter, etc.	26 million tons
Albantonite	Ras Sudr	100 million tons
Turquoise	Umm Bugma	-
Gypsum	Between Abu Zenima and Ras Sudr	18 million tons
Limestone	Many locations	-
Clay	All over South Sinai	-
Ornamental Stone	Coastal areas of Gulf of Aqaba	-

3) Manufacturing

Several kinds of manufacturing industries are expected to start based on the assured available mineral resources in South Sinai Governorate. In addition of that, the agricultural expansion, local market growth and increasing export of products could make the manufacturing industries to grow in the regional economy. The following major manufacturing groups are expected newly to be established and to grow in the Sinai Peninsula within the planning period.

(1)   Construction material industry

i) Two cement factories with a production capacity of 2 million tons per annum.

ii) A ceramics, china and sanitary equipment factory with a production capacity of 15,000 tons per annum.

iii) A grass pane factory with a production capacity of 100,000 tons per annum.

iv) A group of wood and furniture factories with a production capacity of LE1 billion per annum.

(2)   Chemical industry

i) An oil refinery with an annual production capacity of 100,000 tons of sodium carbonate and caustic soda.

ii) An ethylene production plant with a production capacity of 200,000 tons per annum.

(3)   Food industry

i) Factories for pressing and bottling olive oil with an annual production capacity of

50 tons per each factory.

ii) Medium size factories for packaging and preserving vegetables and fruits.

iii) Tanneries and leather product factories with a production capacity of 1,000 tons per annum in total.

(4) Mineral industry

i) A magnesium ferroxide production factories, including the expansion of the present factory with a production capacity of 500,000 tons per annum in total.

ii) A phosphate fertiliser factory with a production capacity of 500,000 tons per annum.

(5) Small scale industries and crafts

This group is defined as a factory whose investment cost does not exceed LE50,000 and whose employees are 4 to 10 workers. The Plan proposes to establish these factories in four compounds in the Sinai Peninsula. In South Sinai Governorate, one compound will be made in El Tur.

In South Sinai Governorate, moreover, two industrial zones will be established in Ras Sudr and El Tur. Each industrial zone has an area of 50 feddan (21 ha), respectively. Ras Sudr industrial zone is planned to have food, chemical and mining industries. El Tur industrial zone is also planned to have food and chemical industries.

4) Tourism

In 1996, there were 26 hotels and tourist villages with an accommodation capacity 10,436 rooms for tourists, as mentioned in Section 4.5. The new accommodation capacity installed up to the target year is approximately 23,320 rooms. They are distributed as follows: 1,000 rooms in El Tur, 6,220 rooms in Ras Sudr, 500 rooms in St. Catherine, 7,600 rooms in Sharm El Sheikh, 4,000 rooms in Dahab and 4,000 rooms in Nuweiba. Then, the total capacity will reach more than 30,000 rooms by the target year 2017.

15.6.3 Urban and Rural Development

"The National Project for the Development of Sinai" proposes that the population in the Sinai Peninsula will increase approximately 2.9 million by the target year 2017. Since the inhabitants are estimated at 0.29 million in 1994, the total population will reach approximately 3.2 million in 2017. In South Sinai Governorate, the population was

estimated at about 40,000 or 14% of the total population in the Sinai Peninsula in 1994 according to the Project. In the target year 2017, it is expected to grow to 677,000 or 21% of the total population in the peninsula. Thus, its growth rate was calculated at 13.1% per annum on average. Table 15.6.3-1 shows the estimated populations of respective cities and their growth rates. The highest average growth rate is 19.9% per annum in Sharm El Sheikh and the lowest is 1.5% in Abu Rudeis and Abu Zenima.

In the Project, residential areas for settlers are estimated on the basis of the following unit rates, i.e., 100 persons per feddan (238 persons per ha) in urban areas and 80 persons per feddan (190 persons per ha) in rural areas. Applying these rates, the residential areas of 30,000 feddan (12,600 ha) will be developed in the Sinai Peninsula, and those of approximately 6,300 feddan (2,650 ha) will be in South Sinai Governorate. Supposing that an average family size in the future is assumed at 4.0, the total housing units of 730,000 will be required in total by the year 2017. Of the total, those of 160,000 will be built in South Sinai Governorate.

The newly developed residential areas and housing units in the future are proposed for the entire Sinai Peninsula as follows.

(1)   Agriculture and fishery areas: 7,500 feddan (3,150 ha) of residential areas and 150,000 housing units

(2)   Industry, mining and energy areas: 4,000 feddan (1,680 ha) and 100,000 units

(3)   Tourism areas: 4,000 feddan (1,680 ha) and 100,000 units

(4)   Manufacturing services and social development areas: 14,000 feddan (5,880 ha) and 350,000 units

15.6.4   Infrastructure Development

1)   Transportation

In the third Five-year National Development Plan and the Sinai Development Plan, the following transportation schemes are proposed to expand in South Sinai Governorate by the target year 2017.

(1)   Road

i)   Widening the Aqaba Gulf highway connecting Taba, Nuweiba, Dahab and Sharm El Sheikh.

    ii)   Ras Sudr/ Sudr El Heitan/ El Hasana/ Quseima route, 218 km.

    iii) Nuweiba/ Dahab/ Ras Nasrani route, 140 km.

(2)   Railway

A new railway line will be built along the east coast of the Suez Gulf down to Ras Mohammed then head northward along the west coast of the Aqaba Gulf. This route will be 500 km long.

(3)   Port

An international port will be developed in El Tur for international tourists coming to visit El Tur itself and St. Catherine Mountains.

(4)   Airport

    i)   Construction of a run way for small aircraft in both Dahab and Nuweiba.

    ii)   Developing St. Catherine airport as a local airport.

    iii) Developing Ras Nasrani airport (Sharm El Sheikh) as an international airport.

(5)   Storage

Construction of a grain silo in El Tur.

2) Electricity

The total electricity load in South Sinai Governorate will reach 180 MW in the target year 2017. To meet this load, the following projects are proposed in the Sinai Development Plan.

(1)   Until the end of 1997

    i)   Expansion of Sharm El Sheikh generating station, 40.0 MW.

    ii)   Expansion of Dahab generating station, 21.2 MW.

    iii) Expansion of Nuweiba generating station, 5.0 MW.

    iv) Expansion of Ras Sudr generating station, 7.4 MW.

    v)   During this period, the necessary electricity network is also established.

(2)   Between 1997 and 2005

    i) Establishing two 220/22 KV step-down transformer substations at El Tur and Abu Rudeis.

    ii) Establishing 220 KV aerial lines to link the above two transformer substations, and to link them with Ayun Musa generating station constructed in the period. Its total length is 340 km.

(3)   Beyond 2005 to 2017

No specific projects in South Sinai Governorate.

3) Water Supply

The Plan proposes the following water supply projects in or to South Sinai Governorate up to the target year 2017.

(1)   Connecting pipeline

    i) Horizontal southern axis from Wadi Feiran to the crossing point with Dahab-Nuweiba main road.

    ii) Vertical eastern axis from Rafah to Sharm El Sheikh along the west coast of the Gulf of Aqaba.

    iii) Vertical western axis from El Shat to Sharm El Sheikh along the east coast of the Gulf of Suez.

(2)   Desalination plant

    i) Dahab

    ii) Nuweiba

    iii) Sharm El Sheikh

    iv) El Tur

(3)   Local feeding network

For every 20 residential area; to be undertaken by local authorities

(4)   Sewage network

For every 20 residential area; to be undertaken by local authorities

4) Education

The Plan proposes a target goal of education program in the Sinai Peninsula by the year 2017 as follows.

(1) Primary and preparatory level

  i) Increasing to 1,231 primary schools with 10,119 classes in 2017 from 268 schools with 1,587 classes in 1997.

  ii) Increasing to 768 preparatory schools with 8,490 classes in 2017 from 115 schools with 724 classes in 1997.

(2) Higher level

  i) Increasing to 537 preparatory schools with 7,191 classes in 2017 from 52 schools with 456 classes in 1997

  ii) Establishing Sinai University with a capacity of 2,400 students.

5) Health

The Plan proposes a target goal of medical services program in the Sinai Peninsula by the year 2017 as follows.

(1) Hospital

  i) Establishing 55 hospitals by Ministry of Health with a capacity of 3,300 beds. In 2017, the total number of public hospitals will be 82 with a bed capacity of 3,750.

  ii) Establishing 23 private hospitals with a capacity of 1,400 beds. In 2017, the total number of private hospitals will be 29 with a bed capacity of 1,500.

(2) Medical staff in 2017

  i) Increase in physicians, 3,600.

  ii) Increase in nurses, 4,500.

  iii) Increase in indirect employees, 16,000.

6)   Other Social Services

Besides educational and medical services, the Plan proposes target goals of the following social services in the Sinai Peninsula by the year 2017 as follows.

-   Increasing 300 religious facilities in 2017 in addition to 331 facilities at present.

-   Increasing 15 culture houses and 2 cultural centres in 2017 in addition to 41 establishments of libraries, art exhibitions and broadcast stations at present.

-   Increasing 400 youth and sports centres in 2017 in addition to 79 centres at present.

-   Increasing 20 training centres with professional training program in 2017 in addition to 10 centres at present.

-   Increasing 100 social welfare establishments in 2017 in addition to 102 establishments at present.

-   Increasing 10 security service units in 2017 in addition to 14 units at present.

-   Increasing more judicial courts in 2017 in addition to 2 courts at present.

Table 15.1-1   List of Community in South Sinai Governorate: 1986 Census

Item	El Tur	Abu Zenima	Ras Sudr	Abu Rudeis	St. Catherine	Sharm El Sheikh	Dahab	Nuweiba
City Core	El Tur	Abu Zenima	Ras Sudr	Abu Rudeis	St. Catherine	Sharm El Sheikh	Dahab	Nuweiba
Community 1	Wadi El Tur	Wadi Tal	Abu Swira	Wadi Gebran	Wadi El 40	Namaa Bay	Vir Oghst	Nu-Magena
Community 2	El Gedal	El Nasb	Abu Geada	Mokattab	Abu Sibla	Ras Nasrani	El Admla	El Tarabin
Community 3	Wadi Mebeid	Wadi Gharandal	El Nahayat and El Farsbet	Wadi Sidri	Wadi El Raha	Nabq	El Mashouba	Ras El Saada
Community 4	Wadi Mir	El Ramsa	El Baga	Abu Gharakd	Nabi Saleh	Kharaza	El Masbat	Ain Furtaga
Community 5	Wadi Hibran	El Crashe	Ein Sudr	Seal El Yanes	Sheikh Mohsen	Wadi El Kapsh	El Migirhe	Birzghyo
Community 6	Wadi Isla	El Sahou	Helifia	El Perima	El Rahba	Wadi Mardo	El Seal	Taba and Wasit Sarek
Community 7	Wadi Wegwin	El Hewesh	El Saleha	Nesrein	Air Port	Rawasat El Hsanate		Wadi Mosgha
Community 8	Wadi Abura	Km-9	El Racna	Oam El Qsom	Wadi El Naso			El Thaora
Community 9	Wadi Abu Higab	Sarbut El Khadm	Wadi Sudr	Wadi El Tar	El Esbayia			El Shikh Attia
Community 10	Wadi Thiman	Km-45	Madkhal	El Hesowa	El Tarfa Village			
Community 11	Wadi El Qaa	El Ein	El Matha	Bir Sulfa	Wadi Sahab			
Community 12	Wadi Village	El Bada	El Rena	Kepair	Green Wadi			
Community 13	Ras-Raia	El Habus		Akhbar	Wadi Soala			
Community 14		El Lehian		Sealsiah	Sheikh Awad			
Community 15		El Samra		El-Fouraa	Bir Zaitouna			
Community 16				Wadi Mekatab	Wadi Feiran			
Community 17				Wadi Sahab				
Community 18				Wadi Asiaf				

Source: 1986 Population Census, CAPMAS

Table 15.2.1-1 Population by City in South Sinai Governorate and Egypt:
1986 and 1996

City Governorate Country	1986 (Census)			1996 (Census, Preliminary)		
	Total Population	Urban Population	Rural Population	Total Population	Urban Population	Rural Population
1. El Tur	6,483	4,338	2,145	14,155	12,072	2,083
2. Ras Sudr	5,392	1,329	4,063	6,501	1,419	5,082
3. Abu Zenima	3,023	883	2,140	5,570	2,645	2,925
4. Abu Rudeis	5,129	2,515	2,614	7,438	4,152	3,286
5. St. Catherine	3,363	347	3,016	4,219	754	3,465
6. Sharm El Sheikh	1,556	869	687	7,197	4,799	2,398
7. Dahab	1,584	281	1,303	3,758	1,077	2,681
8. Nuweiba	2,399	861	1,538	5,657	2,405	3,252
South Sinai Governorate	28,929	11,423	17,506	54,495	29,323	25,172
Male	17,622	8,260	9,362	33,666	19,487	14,179
Female	11,307	3,163	8,144	20,829	9,836	10,993
Egypt (in 1000)	48,254	21,216	27,039	59,272	25,471	33,801
Male	24,709	10,909	13,800	30,331	13,059	17,272
Female	23,545	10,307	13,238	28,941	12,412	16,529

Source: Statistical Year Book 1990-1995, July 1996, CAPMAS
        Statistical Year Book 1991-1996, June 1997, CAPMAS
        Data Center of South Sinai Governorate, 1996
Note: The population figures of Egypt exclude Egyptians abroad.

Table 15.2.1-2   Population by City and by Urban/Rural in South Sinai Governorate: 1996

Name of City	Total	Less Than 6 Years Old	6 Years to 10 Years	10 Years to 15 Years	15 Years to 60 Years	More Than 60 Years
I. Total Population						
1. El Tur	14,155	2,167	1,519	1,347	8,917	205
2. Ras Sudr	6,501	1,136	740	813	3,690	122
3. Abu Zenima	5,570	942	615	517	3,351	145
4. Abu Rudeis	7,438	1,373	476	545	4,847	197
5. St. Catherine	4,219	1,055	459	295	2,269	141
6. Sharm El Sheikh	7,197	338	183	321	6,022	333
7. Dahab	3,758	511	278	414	2,502	53
8. Nuweiba	5,657	776	369	502	3,824	186
South Sinai Governorate	54,495	8,298	4,639	4,754	35,422	1,382
II. Urban Population						
1. El Tur	12,072	1,799	1,284	1,060	7,773	156
2. Ras Sudr	1,419	168	160	100	971	20
3. Abu Zenima	2,645	410	268	213	1,722	32
4. Abu Rudeis	4,152	411	203	204	3,216	118
5. St. Catherine	754	81	47	31	578	17
6. Sharm El Sheikh	4,799	231	123	176	4,133	136
7. Dahab	1,077	94	48	21	881	33
8. Nuweiba	2,405	271	100	129	1,847	58
South Sinai Governorate	29,323	3,465	2,233	1,934	21,121	570
III. Rural Population						
1. El Tur	2,083	368	235	287	1,144	49
2. Ras Sudr	5,082	968	580	713	2,719	102
3. Abu Zenima	2,925	532	347	304	1,629	113
4. Abu Rudeis	3,286	962	273	341	1,631	79
5. St. Catherine	3,465	974	412	264	1,691	124
6. Sharm El Sheikh	2,398	107	60	145	1,889	197
7. Dahab	2,681	417	230	393	1,621	20
8. Nuweiba	3,252	505	269	373	1,977	128
South Sinai Governorate	25,172	4,833	2,406	2,820	14,301	812

Source: Number of Population and Housing, 1996 Census, CAPMAS

Table 15.2.1-3   Population Density by City in South Sinai Governorate and Egypt: 1996

Area	Land Area (km²)		Population		Population Density (Persons/km²)	
	Total Area	Inhabited Area			Total Area	Inhabited Area
I. Population and Land Area in South Sinai Governorate (Net)						
1. El Tur	21.3	12.9	12,072	*1	567.7	939.0
2. Ras Sudr	16.8	4.2	1,419	*1	84.4	337.9
3. Abu Zenima	21.1	1.9	2,645	*1	125.5	1,360.2
4. Abu Rudeis	10.2	5.9	4,152	*1	407.5	703.1
5. St. Catherine	3.4	3.1	754	*1	219.2	245.3
6. Sharm El Sheikh	1.8	1.3	4,799	*1	2,701.2	3,808.7
7. Dahab	15.4	10.5	1,077	*1	69.8	102.6
8. Nuweiba	29.5	8.5	2,405	*1	81.7	282.1
Total of 8 Cities	119.4	48.3	29,323	*1	245.5	607.5
II. Population and Land Area (Gross)						
1. South Sinai Gov.	28,438 *2	- *3	54,495	*4	1.9	-
2. Egypt	997,738 *5	35,188 *3	59,272	*4	0.1	1.7

Source: Statistical Year Book 1991-1996, June 1997, CAPMAS
  Statistical Year Book 1991-1996, June 1997, CAPMAS
  Number of Population and Housing, 1996 Census, CAPMAS
Note: *1 Urban population
  *2 The total area of the governorate was given through the internet.
  *3 According to "Statistical Year Book 1990-1995, July 1996, CAPMAS", the inhabited area in the governorate is defined as "an area excluding desert area or uninhabited area".
  *4 The total population of urban and rural ones.
  *5 Excluding the regional water area.

Table 15.2.2-1   Population, Labour Force and Employment in Egypt: 1960, 1976, 1986
and 1993/34

(Unit: 1000)

Item	1960	1976	1986	1993/94
1. Population	25,984	36,626	48,254	57,556
a. Under Production Age (Less Than 15)	11,110	14,629	19,281	22,706
- Male	5,735	7,552	9,955	-
- Female	5,375	7,077	9,326	-
b. Production Age (15-64)	13,971	20,680	27,102	32,747
- Male	6,915	10,453	13,761	-
- Female	7,056	10,226	13,341	-
c. Old Age (Over 65)	903	1,317	1,871	2,103
- Male	418	642	993	-
- Female	485	675	878	-
2. Labour Force and Unemployment				
a. Number of Workers (6 Years and Over)	-	-	38,955	-
1) In Labour Force	-	-	13,400	-
- Male	-	-	11,933	-
- Female	-	-	1,467	-
2) Out of Labour Force	-	-	25,554	-
- Male	-	-	8,028	-
- Female	-	-	17,526	-
b. Labour Force	-	-	13,400	16,013
c. Employment	-	-	-	14,436
d. Unemployment	-	-	-	1,577
e. Unemployment Rate (%)	-	-	-	9.8%

Source: Statistical Year Book 1990-1995, July 1996, CAPMAS
Annual Report 1993/94, Central Bank of Egypt

Table 15.2.2-2   Distribution of Workers (6 Years and Over) by Major Groups of Economic Activity in Egypt: 1960, 1976 and 1986 Census Years

(Unit: 1000)

Economic Activity	1960	1976	1986
I. Total	7,727	10,256	12,237
1. Agricultural Sector	4,407	4,881	4,778
a. Agriculture, Livestock & Fishery	4,407	4,881	4,778
2. Industrial Sector	930	1,890	2,538
a. Mining & Quarrying	21	34	44
b. Manufacturing	713	1,369	1,524
c. Construction	159	425	873
d. Electricity, Gas & Water	37	62	97
3. Services Sector	2,271	3,299	4,419
a. Commerce & Catering	641	861	870
b. Transportation & Communication	260	482	662
c. Finance, Real Estate & Business Services	1	88	238
d. Community, Social & Personal Services	1,369	1,868	2,649
4. Activity Not Described	119	186	502
II. Urban	2,674	4,386	5,731
1. Agricultural Sector	327	455	652
a. Agriculture, Livestock & Fishery	327	455	652
2. Industrial Sector	678	1,415	1,768
a. Mining & Quarrying	16	22	29
b. Manufacturing	526	1,047	1,101
c. Construction	107	302	575
d. Electricity, Gas & Water	29	44	63
3. Services Sector	1,587	2,408	3,032
a. Commerce & Catering	416	616	653
b. Transportation & Communication	200	372	456
c. Finance, Real Estate & Business Services	1	72	197
d. Community, Social & Personal Services	970	1,348	1,726
4. Activity Not Described	82	108	279
III. Rural	5,054	5,870	6,506
1. Agricultural Sector	4,080	4,426	4,126
a. Agriculture, Livestock & Fishery	4,080	4,426	4,126
2. Industrial Sector	252	475	770
a. Mining & Quarrying	5	12	15
b. Manufacturing	187	322	423
c. Construction	52	123	298
d. Electricity, Gas & Water	8	18	34
3. Services Sector	685	891	1,387
a. Commerce & Catering	225	245	217
b. Transportation & Communication	60	110	206
c. Finance, Real Estate & Business Services	1	16	41
d. Community, Social & Personal Services	399	520	923
4. Activity Not Described	37	78	223

Source: Statistical Year Book 1990-1995, July 1996, CAPMAS

Table 15.2.3-1   Average Annual Household Expenditure by Principal Expenditure Item in Egypt: 1991

(Unit: LE per Year)

Item	Family Size (Persons/Household)					Overall Average
	1	2	3	4	5 and More	
I. Samples						
Number of Households	4,733	2,549	775	249	50	8,354
Number of Persons	23,167	13,459	4,682	1,854	452	43,614
II. Average Annual Expenditure (LE)						
1. Food and Beverages	2,530	2,930	3,219	3,714	4,135	2,761
2. Tobacco, Cigarettes and Drugs	202	238	337	495	522	236
3. Apparel, Textiles, Yarn and Foot Wear	395	526	581	713	942	465
4. Housing and Utilities	470	514	485	526	627	488
- Housing Expenditure	324	353	315	345	438	333
- Fuel, Light & Water	146	161	171	181	190	154
5. Furniture, Appliances and House Services	232	308	337	525	319	268
6. Health Care and Medical Services	212	262	297	483	453	245
7. Transport and Communication	272	450	469	459	489	351
8. Education Expenditure	149	192	131	156	140	161
9. Culture, Sport and Entertainment	156	209	168	195	226	175
10. Hotels, Coffees and Restaurants Services	101	135	206	333	437	130
11. Other Consumption	210	271	325	401	526	247
Total of Consumption Expenditure	4,930	6,035	6,555	7,798	8,797	5,526
12. Transfer Payments	130	118	207	234	297	139
13. Premium Payments	12	27	40	14	17	19
Total of Expenditure	5,072	6,180	6,802	8,046	9,111	5,685

Source: Average Annual Household Expenditure on Principal and Sub-Expenditure Groups, 1996, CAPMAS

Table 15.3.1-1 Gross Domestic Product by Economic Sector at Current Prices: 1991/92-1995/96

Economic Sector	1991/92	1992/93	1993/94	1994/95	1995/96*1
Gross Domestic Product (GDP: LE Billion at Factor Cost)					
1. Commodity Sectors	65.4	72.8	80.9	93.8	110.4
1) Agriculture	21.7	24.4	27.5	32.1	38.8
2) Industry & Mining	21.7	24.4	28.0	33.3	39.7
3) Petroleum & Products	13.0	13.9	13.4	15.1	16.4
4) Electricity	2.2	2.9	3.5	3.8	4.1
5) Construction	6.7	7.1	8.5	9.5	11.5
2. Production Services Sectors	43.6	48.1	52.7	62.3	74.3
1) Transportation & Communications	14.8	15.9	17.6	19.7	22.5
2) Trade, Catering and Finance	28.8	32.1	35.2	42.6	51.8
3. Social Services Sectors	22.1	25.3	29.4	35.0	38.3
1) Real Estate Ownership	2.4	2.6	2.9	3.5	4.1
2) Public Utilities	0.4	0.5	0.6	0.7	0.9
3) Social, Personal and Government	19.3	22.3	26.0	30.9	33.3
4. **GDP**	131.1	146.2	163.0	191.0	225.3
GDP per Capita					
1. In Local Currency (LE)	2,425	2,650	2,894	3,323	3,840
2. In US$ Equivalent (US$)	751	794	859	981	1,132

Source: Statistical Year Book 1990-1995, July 1996, CAPMAS
Recent Economic Development and Statistics, October 1997, MOE
Note: *1 Quoted from the source (2), but others are quoted from the source (1).

Table 15.3.1-2 Percentage Distribution of GDP by Economic Sector: 1991/92-1995/96

(Unit: %)

Economic Sector	1991/92	1992/93	1993/94	1994/95	1995/96
1. Commodity Sectors	49.9	49.8	49.6	49.1	50.0
1) Agriculture	16.5	16.7	16.9	16.8	17.2
2) Industry & Mining	16.6	16.7	17.2	17.4	17.6
3) Petroleum & Products	9.9	9.5	8.2	7.9	7.3
4) Electricity	1.7	2.0	2.1	2.0	1.8
5) Construction	5.1	4.9	5.2	5.0	5.1
2. Production Services Sectors	33.3	32.9	32.3	32.6	33.0
1) Transportation & Communications	11.3	10.9	10.8	10.3	10.0
2) Trade, Catering and Finance	22.0	22.0	21.6	22.3	23.0
3. Social Services Sectors	16.8	17.3	18.0	18.3	17.0
4. Total	100.0	100.0	100.0	100.0	100.0

Table 15.3.1-3   Gross Domestic Product by Economic Sector at 1991/92 Constant Prices: 1991/92-1995/96

Economic Sector	1991/92	1992/93	1993/94	1994/95	1995/96
Gross Domestic Product (LE Billion)					
1. Commodity Sectors	65.4	66.9	70.2	73.2	76.4
1) Agriculture	21.7	22.2	23.1	23.7	24.5
2) Industry & Mining	21.7	22.4	23.3	25.1	27.0
3) Petroleum & Products	13.0	13.2	14.3	14.4	14.4
4) Electricity	2.2	2.3	2.4	2.5	2.7
5) Construction	6.7	6.8	7.1	7.5	7.9
2. Production Services Sectors	43.6	44.5	45.6	47.9	50.7
1) Transportation & Communications	14.8	14.9	15.1	15.4	16.1
2) Trade, Catering and Finance	28.8	29.6	30.5	32.5	34.6
3. Social Services Sectors	22.1	23.0	23.9	25.1	26.3
1) Real Estate Ownership	2.4	2.5	2.6	2.7	2.8
2) Public Utilities	0.4	0.4	0.5	0.5	0.5
3) Social Insurance	19.3	20.1	20.8	21.9	23.0
4. **GDP**	131.1	134.3	139.6	146.1	153.4
GDP per Capita (LE)	2,425	2,435	2,480	2,543	2,614

Source: Annual Report 1993/94, Central Bank of Egypt
   Statistical Year Book 1991-1996, June 1997, CAPMAS

Table 15.3.1-4   Real Growth Rate of GDP by Economic Sector: 1991/92-1995/96

(Unit: %)

Economic Sector	1991/92	1992/93	1993/94	1994/95	1995/96
1. Commodity Sectors	-	2.3	4.9	4.3	4.3
1) Agriculture	-	2.5	3.8	2.9	3.1
2) Industry & Mining	-	2.9	4.2	7.7	7.5
3) Petroleum & Products	-	1.6	8.6	0.1	0.0
4) Electricity	-	3.4	3.7	6.0	5.3
5) Construction	-	1.0	4.1	5.7	5.5
2. Production Services Sectors	-	2.0	2.5	5.0	5.8
1) Transportation & Communications	-	0.2	1.7	2.1	4.5
2) Trade, Catering and Finance	-	3.0	2.9	6.5	6.5
3. Social Services Sectors	-	4.0	3.9	5.1	5.1
4. **GDP**	-	2.5	3.9	4.7	4.9
GDP per Capita	-	0.4	1.8	2.5	2.8

Table 15.3.1-5 Gross Domestic Product Expected in New Five-Year Plan: 1997/98-2001/02

Economic Sector	GDP (LE Billion)		Growth Rate*1 (%)	% Distribution	
	1996/97	2001/02		1996/97	2001/02
I. Commodity Sectors	**118.5**	**168.8**	**7.3**	**49.5**	**50.4**
1) Agriculture	42.3	52.0	4.2	17.7	15.5
2) Industry & Mining	43.4	72.4	10.8	18.1	21.6
3) Petroleum & Products	15.9	16.7	1.1	6.6	5.0
4) Electricity	4.2	6.2	7.9	1.8	1.8
5) Construction	12.8	21.5	11.0	5.3	6.4
2. Production Services Sectors	**77.6**	**111.1**	**7.5**	**32.4**	**33.2**
1) Transportation & Communications	16.2	24.2	8.4	6.8	7.2
2) Suez Canal	6.5	6.7	0.6	2.7	2.0
3) Trade	41.4	59.1	7.4	17.3	17.7
4) Finance	9.4	13.8	7.9	3.9	4.1
5) Insurance	0.2	0.3	10.1	0.1	0.1
6) Hotel & Restaurants	3.8	7.0	12.9	1.6	2.1
3. Social Services Sectors	**43.4**	**55.0**	**4.8**	**18.1**	**16.4**
1) Real Estate Ownership	4.4	6.3	7.4	1.8	1.9
2) Public Utilities	0.9	1.5	10.2	0.4	0.4
3) Social Insurance	0.2	0.2	7.3	0.1	0.1
4) Government Services	18.9	23.7	4.6	7.9	7.1
5) Social & Personal Services	19.1	23.4	4.2	8.0	7.0
4. GDP	**239.5**	**335.0**	**6.9**	**100.0**	**100.0**

Source: The Five-year Plan of Economic and Social Development 1997/98-2001/02, April 1997, GOE
Note: *1 Annual rate on average during the plan period of five years.

Table 15.3.1-6 Macroeconomic Projections by IMF: 1997/98-2001/02

Item	1997/98	1998/99	1999/00	2000/01	2001/02
1. GDP Growth (%)					
1) Real GDP	5.4	5.7	6.2	6.5	6.8
2) Real GDP per Capita	3.3	3.7	4.1	4.4	4.2
2. Inflation (%)	6.0	5.6	5.4	5.0	4.5
3. Nominal Interest Rate (%)	8.5	8.1	7.8	7.3	6.8
4. Real Interest Rate (%)	2.4	2.4	2.3	2.2	2.2
5. Fiscal Accounts (as % of GDP)					
1) Revenues	24.9	24.4	23.8	23.0	22.2
2) Expenditures	25.9	24.9	24.3	23.6	23.1
3) Overall Balance	-0.9	-0.5	-0.4	-0.6	-0.9
6. External Accounts (US$ Billion)					
1) Trade Balance	-11.3	-12.4	-13.2	-13.8	-14.1
2) Current Account Balance	-0.3	-1.3	-2.0	-2.2	-2.0
3) Overall Balance	0.8	0.3	0.1	0.1	0.2
4) External Debt	28.2	27.8	27.3	26.7	26.3

Source: Recent Economic Development and Statistics, October 1997, MOE

Table 15.3.4-1 Number of Manufacturing Establishments by Industrial Type in South Sinai
Governorate: 1996

Industrial Type	Number of Manufacturing Establishment (Nos)
1. Building Materials	9
2. Chemicals & Pharmaceuticals	0
3. Engineering &Electrical Products	3
4. Food Industry	22
5. Mineral Industry	3
6. Petroleum Industry	23
7. Spinning & Weaving	0
Total	60

Source: Statistical Data Book, Jan. 1996, South Sinai Governorate

Table 15.3.4-2 Number of Manufacturing Establishments by Type of Management in South Sinai
Governorate: 1996

Scale of Industry	Type of Management					Total
	Government	Private	Cooperative	Joint Enterprise	Third Sector	
1. More Than 500 Employees	1	0	0	0	1	2
2. More Than 100 Employees	5	3	0	0	2	10
3. More Than 50 Employees	4	3	0	0	0	7
4. More Than 10 Employees	1	4	0	0	0	5
5. Less Than 10 Employees	0	36	0	0	0	36
Total	11	46	0	0	3	60

Source: Statistical Data Book, Jan. 1996, South Sinai Governorate

Table 15.3.4-3 Growth of Sinai Manganese Refinery in South Sinai Governorate: 1991-1995

Item	1991	1992	1993	1994	1995
1. Capital (LE Million)	8,938	11,102	11,102	11,102	11,102
2. Number of Employees (Nos.)	788	893	1,027	1,011	981
3. Salary for Employees (LE1000)	4,656	5,369	5,766	6,566	7,491
4. Production (LE1000)	9,186	13,640	13,991	19,211	73,508
5. Sales (LE1000)	6,953	10,700	10,434	12,491	23,466
6. Export (LE1000)	313	659	2,486	7,017	38,954

Source: Statistical Data Book, Jan. 1996, South Sinai Governorate

Table 15.3.5-1 Inventory of Accommodation for Tourists: 1992/93

City	Number of Rooms*1 (Nos.)		
	Existing	Under Construction	Total
1. El Tur	78	0	78
2. Ras Sudr	331	220	551
3. St. Catherine	227	0	227
4. Sharm El Sheikh	2,113	1,600	3,713
5. Dahab	241	0	241
6. Nuweiba	595	0	595
Total	3,585	1,820	5,405

Source: Sinai Development Plan, 1994, MOP
Note: *1 Including hotels and touristic villages

Table 15.3.6-1 Exports of Major Commodities: 1990-1996

(Unit: LE Million)

Commodity	1990	1991	1992	1993	1994	1995	1996*1
1 Petroleum Oil, Crude	1,290	4,655	3,100	3,623	2,685	2,383	2,773
2 Cotton, Raw	562	196	175	147	791	517	312
3 Cotton Yarn	1,046	987	820	721	1,280	1,039	657
4 Cotton Fabrics	220	309	237	272	409	371	301
5 Clothing, Manufactured	465	554	543	665	780	858	812
6 Petroleum Shale Oils Other Than Crude	496	754	761	808	798	757	1,833
7 Sugar Cane, Refined	1	12	0	5	0	8	4
8 Oranges	148	142	108	56	28	44	59
9 Rice	49	123	191	135	268	193	400
10 Potatoes	68	152	142	108	98	347	271
11 Aluminum Products	534	432	563	406	405	23	23
12 Others	2,074	3,448	3,733	3,651	4,382	5,414	4,831
Total	6,954	11,765	10,374	10,596	11,925	11,954	12,277

Source: Statistical Year Book 1990-1995, July 1996, CAPMAS
Statistical Year Book 1991-1996, June 1997, CAPMAS
Note: *1 Preliminary Estimates

Table 15.3.6-2 Imports of Major Commodities: 1990-1996

(Unit: LE Million)

Commodity	1990	1991	1992	1993	1994	1995	1996*1
1 Wheat	2,129	1,615	2,350	1,131	2,501	2,976	3,738
2 Wheat Flour	621	317	175	470	235	202	43
3 Maize	514	428	593	807	893	1,185	1,478
4 Meat Chilled or Frozen	564	437	400	563	535	600	498
5 Daily Products	554	406	525	503	509	574	614
6 Sugar Refined	654	528	385	204	52	230	121
7 Motor Vehicles for Transport of Goods	80	24	63	63	260	96	209
8 Automobiles	273	336	388	550	746	741	692
9 Parts for Motor Vehicles and Tractors	463	364	472	518	762	760	674
10 Building Iron Bars and Rods	412	220	109	260	91	98	353
11 Construction Machinery	179	178	208	224	323	345	415
12 Organic and Inorganic Chemicals	310	1,102	971	947	1,107	1,525	1,491
13 Cement	35	14	3	4	52	165	309
14 Others	18,036	19,246	21,014	21,307	24,394	30,394	33,582
Total	24,823	25,216	27,656	27,550	32,461	39,891	44,218

Source: Statistical Year Book 1990-1995, July 1996, CAPMAS
Statistical Year Book 1991-1996, June 1997, CAPMAS
Note: *1 Preliminary Estimates

Table 15.3.6-3 Exports by Major Countries: 1990-1995

	Commodity	1990	1991	1992	1993	(Unit: US$ Million)	
						1994	1995*1
1	USA	222	278	286	603	365	595
2	Germany	156	137	127	242	210	363
3	France	104	216	129	268	138	220
4	Italy	316	542	433	832	427	996
5	United Kingdom	77	79	102	258	144	355
6	Japan	70	51	74	93	50	86
7	Korea	28	36	57	86	106	105
8	China, People's Rep.	6	-	-	22	11	12
9	Rumania	28	124	93	79	43	334
10	Russia	-	-	73	131	41	34
11	Israel	168	369	290	15	188	34
12	Saudi Arabia	77	114	202	258	155	215
13	Brazil	-	1	2	15	5	21
14	Other Countries	1,333	1,712	1,182	2,224	1,564	1,984
	Total	2,585	3,659	3,050	5,126	3,447	5,354

Source: Direction of Trade Statistics Yearbook, 1996, IMF
Note: *1 Preliminary Estimates

Table 15.3.6-4 Imports by Major Countries: 1990-1995

	Commodity	1990	1991	1992	1993	(Unit: US$ Million)	
						1994	1995*1
1	USA	1,301	1,265	1,455	3,039	1,617	3,284
2	Germany	1,014	821	861	1,426	914	1,666
3	France	865	544	415	1,132	593	1,298
4	Italy	601	533	544	1,326	614	1,325
5	United Kingdom	368	356	361	556	350	667
6	Japan	343	320	358	821	401	891
7	Korea	111	75	92	277	107	517
8	China, People's Rep.	103	102	184	220	195	484
9	Rumania	95	66	61	111	121	200
10	Russia	-	-	30	187	274	433
11	Israel	41	4	12	10	13	33
12	Saudi Arabia	76	135	104	82	194	217
13	Brazil	134	87	135	193	158	407
14	Other Countries	4,164	3,554	3,679	5,162	3,930	5,973
	Total	9,216	7,862	8,291	14,542	9,481	17,395

Source: Direction of Trade Statistics Yearbook, 1996, IMF
Note: *1 Preliminary Estimates

Table 15.3.7-1   Price Indices in Egypt: 1985-1997

Year	Month	Consumer Price Index in Rural (1986/87=100)			Wholesale Price Index (1965/66 = 100)					
		All Items	Food & Beverages	Trans-portation	All Items	Agricul-tural Crops	Petroleum & Fuel	Wood	Transport Equipment Products	Construc-tion Materials
1985		74.8	75.5	66.7	487.8	657.7	352.2	560.9	399.7	690.1
1986		91.8	22.2	100.0	572.1	829.4	414.1	606.1	486.6	744.6
1987		106.1	102.8	100.0	650.2	876.1	524.6	886.7	338.7	570.5
1988		125.6	126.4	116.9	820.9	1,023.3	706.3	1,044.2	669.8	907.5
1989		155.3	163.0	149.9	1,044.9	1,421.9	800.9	1,444.0	849.4	1,081.4
1990		181.5	191.5	190.1	1,220.3	1,581.7	947.1	1,650.3	975.0	1,247.1
1991		211.3	218.2	227.5	1,581.7	1,844.4	1,325.4	1,827.7	1,325.3	1,615.4
1992		235.5	231.2	259.3	1,612.4	1,983.1	2,079.9	1,957.8	1,694.2	1,889.5
1993		260.2	247.3	335.0	1,751.3	2,086.0	2,445.2	2,012.2	1,834.2	2,042.8

Year	Month	Consumer Price Index in Rural (1986/87=100)			Wholesale Price Index*1 (1986/87 = 100)					
		All Items	Food & Beverages	Trans-portation	All Items	Farm Products	Fuel & Its Products	Wood & Its Products	Trans-portation Equipment	Metals
1992		235.5	231.2	259.3	268.0	203.4	511.8	274.1	319.1	268.0
1993		260.2	247.3	335.0	287.9	208.3	591.8	279.4	340.3	275.5
1994		281.7	271.7	263.3	305.3	226.4	619.9	286.0	345.6	292.5
1995		303.0	296.1	380.6	324.5	242.2	626.3	309.8	383.1	326.1
1996		340.2	320.8	357.6	351.6	265.7	632.6	313.7	393.6	341.0
	January	332.6	-	-	338.6	244.6	632.2	313.6	334.2	-
	March	333.4	-	-	342.9	256.0	632.3	313.6	334.2	-
	May	340.1	-	-	352.1	276.6	632.7	313.6	338.0	-
	July	343.2	324.1	360.1	352.7	262.4	632.7	313.6	393.6	344.6
	September	344.5	325.4	360.1	354.2	266.1	632.7	313.6	393.6	344.6
	November	347.3	328.2	360.1	365.7	287.8	632.7	314.1	393.6	347.2
1997 *2										
	January	348.1	328.2	361.6	360.0	271.7	632.7	314.3	393.6	350.3
	March	349.8	330.8	361.6	366.6	289.2	632.7	314.3	393.6	350.3
	May	351.4	332.5	361.6	371.7	302.8	632.7	314.8	393.6	352.7
	July	352.6	333.0	361.6	363.0	279.5	632.7	314.8	393.6	352.7
	September	354.0	334.7	361.6	365.8	287.5	632.7	314.8	393.6	352.7
	November	354.6	335.3	361.6	-	-	-	-	-	-

Source: Statistical Year Book 1952-1993, June 1994, CAPMAS
 Statistical Year Book 1991-1996, June 1997, CAPMAS
 Monthly Bulletin, Consumer Price Index, November 1997, CAPMAS
 Wholesale Price Index, September 1997, CAPMAS
Note: *1 The base year and groups changed in January 1994.
 *2 Applied consumer price index of "Rural Population"

Table 15.3.7-2   Foreign Exchange Rate of LE per US Dollar at the End of Period: 1985-1997

Month	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
January	0.7000	0.7000	0.7000	0.7000	0.7000	1.1000	2.0000	3.3254	3.3387	3.3760	3.3910	3.3900	3.3900
February	0.7000	0.7000	0.7000	0.7000	0.7000	1.1000	3.0620	3.3181	3.3411	3.3760	3.3920	3.3890	3.3890
March	0.7000	0.7000	0.7000	0.7000	0.7000	1.1000	3.1335	3.3192	3.3422	3.3800	3.3890	3.3890	3.3890
April	0.7000	0.7000	0.7000	0.7000	0.7000	1.1000	3.1716	3.3206	3.3417	3.3840	3.3920	3.3890	3.3890
May	0.7000	0.7000	0.7000	0.7000	0.7000	1.1000	3.2222	3.3212	3.3455	3.3860	3.3930	3.3890	3.3890
June	0.7000	0.7000	0.7000	0.7000	0.7000	1.1000	3.2675	3.3216	3.3465	3.3870	3.3950	3.3890	3.3890
July	0.7000	0.7000	0.7000	0.7000	0.7000	2.0000	3.2813	3.3220	3.3555	3.3890	3.3920	3.3920	3.3890
August	0.7000	0.7000	0.7000	0.7000	1.1000	2.0000	3.2855	3.3211	3.3581	3.3860	3.3930	3.3880	3.3890
September	0.7000	0.7000	0.7000	0.7000	1.1000	2.0000	3.2914	3.3177	3.3592	3.3850	3.3900	3.3941	3.3890
October	0.7000	0.7000	0.7000	0.7000	1.1000	2.0000	3.2914	3.3182	3.3643	3.3880	3.3930	3.3942	3.3890
November	0.7000	0.7000	0.7000	0.7000	1.1000	2.0000	3.3197	3.3255	3.3670	3.3940	3.3900	3.3880	3.3880
December	0.7000	0.7000	0.7000	0.7000	1.1000	2.0000	3.3300	3.3303	3.3704	3.3920	3.3900	3.3880	.
Average													
- Primary	0.7000	0.7000	0.7000	0.7000	0.8667	1.5500	3.1380	3.3217	3.3525	3.3853	3.3917	3.3899	3.3889
- Secondary	1.3172	1.3500	1.5408	2.2372	2.5242	1.5500	.	.	.	.	.	.	.
- Tertiary	1.6136	1.8843	2.1469	2.2532	2.6808	2.7188	.	.	.	.	.	.	.

Source: International Financial Statistics, 1985-1997, IMF

Note: Since 1979, ARE introduced a multiple exchange rate system. It comprised (1) Primary rate, which was a fixed rate of the Central Bank; (2) Secondary rate, which was a fixed 'special' rate, or called an incentive exchange rate; and (3) Tertiary rate, which was a free banks' rate to remittances and tourists, which was set daily by a committee composed of representatives from authorized banks dealing in foreign and local currencies.

Table 15.4.1-1　National Road Network Constructed for 20 Years: 1972-1992

No.	Road Title	Number of Road Links	Total Length (km)	Indication of South Sinai*1
1	Magraq El Tur - St. Katherine - Dahab Nuweiba crossroads	3	178	O
2	El Qantara East - Ras Mohamed - El Nakab (Route 66)	20	873	Δ
3	Ras Sudr - Baloza	4	190	Δ
4	Ismailia - El Auga (Route 3)	-	203	
5	El Shat - Nakhl - Taba (Route 33)	9	285	
6	El Bahirat crossroads - El Meliz - El Kuntella	2	81	
7	Sudr El Hitan - Al Auga	4	176	
8	Bir El Abd - El Maghara	7	202	
9	El Arish - 161 Ismailia crossroads (Route 55)	7	146	
10	Ismailia crossroads - El Hassana - Nakhl	2	91	
11	Rafah - El Auga - El Nakab (Route 10)	3	245	
	Total	-	2,670	

Source: The National Project for the Development of Sinai, September 1994, MOP

Note: *1 "O" means that the entire road is included in South Sinai Governorate and "Δ" means that some parts of the road are included in South Sinai Governorate.

Table 15.4.2-1　Current Electric Power Load and Generation Capacity: 1993/94

City Having Power Plant	Load*1 (MW)	Electric Power Generation*2		
		Type	Number	Capacity(MW)
1. El Tur	2.30	Diesel	3	6.60
2. Ras Sudr	1.30	Diesel	6	4.20
3. Abu Rudeis	-	Diesel	4	2.50
4. Sharm El Sheikh	12.50	Gas & Diesel	5	60.00
5. Dahab	1.70	Diesel	3	2.50
6. Nuweiba	2.30	Diesel	3	6.60
Total	20.10		24	82.40

Source: (1) The National Project for the Development of Sinai, Sept. 1994, Ministry of Planning
　　　　(2) Executive Apparatus for Sinai Construction, Ministry of Construction and New Communities

Note: *1 Quoted from the source (1).
　　　 *2 Quoted form the source (2).

Table 15.4.3-1   Overall Situation of Water Supply and Sewage Treatment Capacity: 1993/94

Area	Estimated Population	Unit Rate (lit/capita/day)	Required Quantity (m³/day)	Station Capacity Existing (m³/day)	Under Construction (m³/day)	Deficit (m³/day)
I. Water Supply System						
1. Urban	14,000	240	3,360	-	-	-
2. Rural	19,000	120	2,280	-	-	-
South Sinai Gov	33,000	-	5,640	5,500	0	-140
II. Sewage Treatment System						
1. Urban	14,000	192	2,688	-	-	-
2. Rural	19,000	96	1,824	-	-	-
South Sinai Gov	33,000	-	4,512	2,000	2,000	-512

Source: The National Project for the Development of Sinai, Sept. 1994, Ministry of Planning

Table 15.4.3-2   Current Situation of Water Supply and Sewage Treatment Capacity: 1996

City	Consumer Resident	Tourist	Consumption Volume (m³/day) Resident	Tourist	Others *1	Loss	Total	Production Capacity (m³/day)	Surplus/ Deficit (m³/day)
1. El Tur	8,442	256	1,013	102	1,910	40	3,065	3,960	895
2. Ras Sudr	7,466	1,593	896	637	685	60	2,278	2,940	662
3. Abu Zenima	3,908	0	469	0	365	20	854	580	-274
4. Abu Rudeis	7,372	0	885	0	635	30	1,550	970	-580
5. St. Catherine	4,349	1,088	522	435	151	5	1,113	385	-728
6. Sharm El Sheikh	2,321	7,045	279	2,818	2,210	50	5,357	6,910	1,553
7. Dahab	2,048	1,160	246	464	650	10	1,370	1,990	620
8. Nuweiba	3,103	3,548	372	1,419	*2	20	1,811	680	-1,131
South Sinai Governorate	39,009	14,690	4,682	5,875	6,606	235	17,398	18,415	1,017

Source: Statistical Data Book, Jan. 1996, South Sinai Governorate
Note: *1 Mainly for industrial water
  *2 Brackish water

Table 15.4.6-1   Record of Health Care Activity: 1991-1995

Item	1991	1992	1993	1994	1995
1. Morbidity of Bilharziasis Disease*1					
1) Number of Patients	120	155	274	4,948	3,931
2) Infectious Type					
a. Urine	90	100	210	4,211	2,139
b. Stool	30	55	64	737	1,792
2. Family Planning Centre					
1) Number of Health Units	10	10	13	13	15
2) Number of Women Between 20-45 Years	6,029	6,190	6,355	6,525	8,415
3) Number of Women Visited Center	349	386	437	283	201
4) Number of Women Accepted Family Planning Policy	311	344	390	804	764

Source: Statistical Data Book, Jan. 1996, South Sinai Governorate
Note: *1 A kind of endemic diseases

Table 15.5.1-1　Financial Statement of Entire Governments: 1991/92-1995/96

(Unit: LE Billion)

Item	1991/92	1992/93	1993/94	1994/95	1995/96*1
I. Revenue	**41.4**	**46.7**	**52.6**	**55.7**	**60.9**
1. Current Revenue	37.8	43.7	49.4	52.9	57.7
1) Central Government	35.7	41.0	46.4	49.9	54.5
a. Taxation Revenue	24.3	27.3	31.4	34.3	38.2
- Taxes from Income & Business Profits	10.0	11.1	12.0	12.1	13.7
- Tax-Commodities & Services	6.3	7.2	8.1	9.3	10.5
- Customs Duties	4.6	5.0	6.1	7.0	7.9
- Others	3.4	4.0	5.2	5.8	6.2
b. Non-taxation Revenue	11.4	13.7	15.0	15.6	16.2
2) Local Government	1.4	1.8	2.0	2.0	2.1
3) Service Authorities	0.7	0.9	1.1	1.1	1.1
2. Capital Revenue	3.6	3.0	3.1	2.8	3.2
II. Expenditure	**47.6**	**52.2**	**56.3**	**58.3**	**63.9**
1. Current Expenditure	36.2	41.3	46.1	47.6	52.0
1) Wages	8.0	9.8	11.1	12.5	14.0
2) Other Current Expenditure	28.2	31.5	35.0	35.1	37.9
a. Pensions	2.8	3.5	3.9	4.1	4.3
b. Commodity & Service Requirements	1.8	2.4	2.9	3.0	3.2
c. Defence	4.9	5.6	5.9	6.4	7.0
d. Interests of Public Debts	9.5	13.3	16.5	14.8	16.0
- Local	6.4	9.3	11.8	11.2	12.2
- Foreign	3.2	4.0	4.7	3.6	3.8
e. Subsidies	7.2	4.0	3.3	3.8	4.3
f. Financing of Economic Institutions	0.4	0.3	-	-	-
g. Social Fund	-	0.2	0.3	0.5	0.5
h. Others	1.7	2.1	2.3	2.4	2.6
2. Capital Expenditure	11.4	10.9	10.2	10.6	11.9
1) Investment	12.3	11.1	10.7	11.3	12.6
2) Transfer & National Bank of Investment	-1.0	-0.2	-0.5	-0.7	-0.7
III Balance	**-6.2**	**-5.5**	**-3.7**	**-2.5**	**-3.0**

Source: Statistical Year Book 1991-1996, June 1997, CAPMAS
　　　　Annual Report 1993/94, Central Bank of Egypt
Note: *1 Preliminary estimates

Table 15.5.2-1   Balance of Payment: 1991-1996

(Unit: US$ Billion)

Item	1991	1992	1993	1994	1995	1996
Current-account Balance						
- Merchandise Exports (FOB)	4.16	3.67	3.55	4.04	4.67	4.78
- Merchandise Imports (FOB)	9.83	8.90	9.92	10.00	12.27	13.17
Trade Balance	-5.67	-5.23	-6.38	-5.95	-7.60	-8.39
- Export of Services	6.78	7.72	7.90	8.07	8.59	9.27
- Import of Services	3.36	4.87	5.37	5.65	4.87	5.08
Balance of Goods, and Services	-2.25	-2.38	-3.85	-3.53	-3.88	-4.20
- Inflow of IPD*1	0.86	0.92	1.11	1.33	1.58	1.90
- Outflow of IPD*1	2.14	2.80	1.97	2.11	1.98	1.56
Balance of Goods, Services and IPD	-3.53	-4.26	-4.71	-4.31	-4.29	-3.86
- Net Transfer	5.43	7.08	7.01	4.34	4.03	3.67
Current-account Balance	1.90	2.81	2.30	0.03	-0.25	-0.19
Capital-account Balance						
- Direct Investment	0.19	0.46	0.49	1.21	0.51	0.63
- Portfolio Investment	0.02	0.01	0.00	0.00	0.02	0.55
- Other Investment	-4.92	-0.63	-1.26	-2.67	-2.37	-2.64
Capital-account Balance	-4.71	-0.17	-0.76	-1.45	-1.85	-1.46
Error & Omissions	0.73	0.72	-1.52	0.26	0.27	-0.07
Overall Balance	-2.07	3.36	0.02	-1.16	-1.83	-1.73

Source: International Financial Statistics, December 1997, IMF
Note: Income as interest, profit and dividends

Table 15.5.3-1 Official Development Assistance[*1]: 1990-1994

(Unit: US$ Million)

Item	1990	1991	1992	1993	1994
Bilateral	3,172	4,157	2,996	1,824	2,311
USA	2,346	2,963	1,662	939	685
Italy	87	81	139	145	617
France	140	164	267	261	410
Germany	347	185	715	111	292
Japan	99	620	111	275	189
Canada	32	36	35	31	27
Denmark	20	21	23	26	25
Netherlands	44	0	26	15	20
Austria	-13	9	-31	-16	19
United Kingdom	14	24	17	10	7
Others	57	56	33	27	21
Multilateral	81	358	197	198	290
EC	48	290	72	57	137
IDA	1	-8	-3	8	38
Others	32	76	128	132	116
Arab Countries	2,186	510	409	380	94
Total	5,439	5,025	3,602	2,401	2,695

Source: Geographical Distribution of Financial Flows to Aid Recipients, Disbursements Commitments
      Country Indicators 1990-1994, OECD Development Assistance Committee
Note: *1 Official development assistance is defined as grants and loans, with at least a 25% grant element,
      administered with the aim of promoting economic of social development. Figures indicate
      net amounts.

Table 15.5.3-2   External Debt: 1990-1995

Item	1990	1991	1992	1993	1994	1995
Total External Debt	**32.6**	**33.0**	**31.6**	**31.1**	**33.0**	**34.1**
1. Long Term Debt	28.0	29.8	28.9	28.9	30.9	31.6
2. Use of IMF Credit	0.1	0.1	0.2	0.2	0.2	0.1
3. Short Term Debt	4.5	3.1	2.5	2.0	1.9	2.4
Debt Outstanding of Long Term Deb	**28.0**	**29.8**	**28.9**	**28.9**	**30.9**	**31.6**
1. Public and Publicly Guaranteed	27.0	29.0	28.3	28.4	30.5	31.3
a. Official Creditors	20.8	25.0	25.2	26.0	28.4	29.6
- Multilateral	3.5	3.4	3.4	3.8	4.2	4.2
- Bilateral	17.2	21.6	21.8	22.3	24.3	25.4
b. Private Creditors	6.2	4.0	3.1	2.4	2.1	1.7
- Bonds	0.0	0.0	0.0	0.0	0.0	0.0
- Commercial Banks	0.6	0.9	0.7	0.6	0.6	0.5
- Others	5.6	3.1	2.4	1.8	1.6	1.2
2. Private Non-guaranteed	1.0	0.9	0.6	0.5	0.4	0.3
Total Debt Service	**3.1**	**2.6**	**2.7**	**2.2**	**2.3**	**2.4**
1. Principal Repayment	1.7	1.7	1.5	1.0	0.9	1.0
a. Long Term Debt	1.7	1.6	1.4	1.0	0.9	0.9
b. IMF Repurchases	0.0	0.1	0.0	0.0	0.0	0.1
2. Interest Payments	1.3	0.9	1.2	1.2	1.3	1.4
a. Long Term Debt	1.0	0.7	1.0	1.1	1.2	1.3
b. IMF Charges	0.0	0.0	0.0	0.0	0.0	0.0
c. Short Term Debt	0.3	0.2	0.2	0.2	0.2	0.1
Ratios (%)						
1. Total External Debt/GNP	94.8	102.2	89.4	79.4	78.1	73.3
2. Debt Service Ratio *1	22.5	17.1	15.3	13.6	14.4	14.6

Source: Global Development Finance 1997, March 1997, World Bank
Note: Long term debt is defined as having original maturity of more than one year.
    *1 Debt service as a percentage of earnings from exports of goods and service (including
      workers' remittances).

Table 15.6.3-1   Population Projected in Sinai Development Project: 1994 and 2017

	City Governorate	1994	2017	Average Annual Growth Rate (%)
1.	El Tur	8,919	110,023	11.5%
2.	Ras Sudr	7,480	219,778	15.8%
3.	Abu Zenima	4,316	6,026	1.5%
4.	Abu Rudeis	7,193	10,043	1.5%
5.	St. Catherine	4,603	17,378	5.9%
6.	Sharm El Sheikh	2,014	131,847	19.9%
7.	Dahab	2,302	90,143	17.3%
8.	Nuweiba	3,165	91,348	15.7%
	South Sinai Governorate	39,992	676,586	13.1%
	Sinai Peninsula	286,835	3,209,677	11.1%

Source: The National Project for the Development of Sinai, September 1994, Ministry of Planning

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CHAPTER XVI   PROJECT EVALUATION

16.1   Methodology of Project Evaluation

16.1.1   Procedure of Project Evaluation

The projects proposed in this study are evaluated on the basis of two quantitative analyses: (1) economic evaluation, and (2) financial evaluation. Besides, the projects are evaluated from the viewpoint of social impacts. The economic evaluation is to examine the proposed projects from the economic point of view, that is, viability of social investment in the national economy. The financial evaluation is to inspect the proposed projects from the financial point of view, that is, tests of earning capacity and financial efficiency. The procedure of the project evaluation is illustrated in Fig.16.1.1-1.

The project evaluation is conducted in accordance with the conventional methodology that is commonly applied for evaluation of development in Egypt under finance of the World Bank and other international agencies concerning to technical and economic corporation. The methodology suggests that the project evaluation have two steps for quantifying evaluation factors in general. At first, the project cost and benefit are identified and quantified in monetary terms, which arise from implementation of the proposed projects. Then, they are compared and condensed into evaluation factors. The factors are Internal Rate of Return (IRR) for a main indicator, and Net Present Value (NPV) and Benefit-Cost Ratio (B/C) for supplementary indices.

The IRR is defined as a special rate of discount that settles the following conditions to the satisfaction:

    (i)   The present value of cost is obtained through discounting the all costs incurred during the economic life of the proposed project at the special rate.

    (ii)   The present value of benefit is obtained through discounting the all benefit accruing from the project during the same lifetime at the special rate.

    (iii)   As a result, the present value of cost is equal to the present value of benefit.

In the case that this IRR exceeds the opportunity cost of capital in Egypt, the proposed project could be judged to be viable economically or financially. The NPV shows the magnitude of project incremental benefit. The B/C indicates the gap between the project efficiency and the opportunity cost of capital.

16.1.2   Formulation of Proposed Projects

The projects are formulated into the six schemes as discussed in Chapter XIII. They are composed of three schemes of water supply development plans and three schemes of irrigation development plans. The respective plans are outlined in their schematic

specifications with the following beneficiaries.

Plan No.	Name of Projects	Supply Capacity	Beneficiaries
1	West Coast Side	57,500 m³/day	Populace and facilities for industrial, tourism and municipal activities in Ras Sudr, Abu Zenima and Abu Rudeis Cities
2	East Coast Side	37,000 m³/day	Populace and facilities for tourism and municipal activities in Nuweiba and Taba Cities
3	El Tur City	5,300 m³/day	Populace and facilities for industrial, tourism and municipal activities in El Tur City
4A	Sudr El Heitan	11,700 m³/day	Irrigation facilities in Sudr El Heitan Scheme (714 ha of irrigated field)
4B	Malha	13,700 m³/day	Irrigation facilities in Malha Scheme (840 ha of irrigated field)
4C	Themed	11,700 m³/day	Irrigation facilities in Themed Scheme (714 ha of irrigated field)

The plan of the projects proposes the groundwater development and conveyance systems in the project areas. It does not include the distribution system for end users such as piping networks for individual consumers and distributing water canals for irrigation system. On the other hand, the benefits accruing from beneficiaries are estimated under the conditions that the water supply systems are completely installed to the end users. Thus, the full benefits are not completely gratified with the proposed project schemes. In order to correspond to the proposed schemes, the benefits would be justified on the following assumptions.

(1)   Water supply schemes: the benefits are reduced in proportion to the ratio of the construction cost of the proposed schemes against the total construction costs of the complete water supply system for the end users. As discussed later, this reduction procedure is applied in the financial analysis in particular.

(2)   Irrigation schemes: in the same manner as the above, the benefits from irrigation schemes are reduced in proportion to the ratio of the construction cost of the proposed schemes against the costs of the entire drip irrigation including branch canals, distributaries and field network.

16.1.3   Justification of Projects for Economic Evaluation

Benefit of projects is estimated as a difference of outcomes under "with-project" conditions and under "without-project" conditions. In general, once a water supply project is identified in a certain area, beneficiaries such as residents and social facilities in the area can enjoy the fruits of the projects. On the other hand, if the proposed project

were not implemented, the identified beneficiaries should find other water sources. In the latter case, for instance, they have to rely on desalination system, Nile River water, etc., which should be the same quality and quantity of water as the proposed water source. Needless to say, the water sources in the latter case should be provided by the minimum cost system. Hence, the former is identified as a "with-project" case and the latter is identified as a "without-project" case.

In this situation, benefits of water supply projects are estimated as the total cost of the optimum system under "without-project" conditions. The economic value of water under "with-project" conditions is evaluated by the total costs which would be spent for procurement of the same quantity and quality water expected in the future as the "with-project" case. The total costs of "without-project" case will be eliminated under the "with-project" case. The benefits of the proposed projects of Plans 1 to 3 are justified as follows taking into account of water supply plans in the NPDS.

Under "with-project" conditions, the water consumers, i.e., beneficiaries, will get potable water through the proposed projects. These system outlines are shown in the column of "with-project" case in the table below. On the other hand, they would procure the water through the following water systems provided in minimum cost, unless the proposed projects are introduced in the project site. These systems could be unnecessary under the "with-project" case, so these costs can be benefits for the "with-project" cases.

	"With-Project" Case	"Without-Project" Case
Plan 1	• Water source: intake wells and collection tanks. • Conveyance facilities: conveyance pipeline to the existing aqueduct from Suez to Abu Rudeis with distribution water reservoir. • Existing pipelines and distribution network for individual consumers are not included in the project. • Distribution network for coming water demands: These piping networks have to be constructed in accordance with the water demand increase. However, these works are out of scope of the project.	• Water source: Nile River water[1] • Conveyance facilities: conveyance pipeline between Suez and Abu Rudeis. It is already an existing pipeline of 600~350 mm in diameter. In the future, a new pipeline along the old one will be installed as supplementary purpose.[1]
Plan 2	• Water source: intake wells and collection tanks. • Conveyance facilities: conveyance pipeline to Nuweiba and Dahab Cities. • Distribution networks: existing piping networks for consumers are utilised as they are. For increasing future	• Water source: freshwater source made with a reverse osmosis desalination system, which is the minimum cost system for this system scale. • Conveyance facilities: few facilities are necessary, because the plants could be set up in the project sites.

	demands, new piping networks will be constructed in the respective cities, although they are out of scope of the project.	
Plan 3	• Water source: intake wells and collection tanks in northern area of El Tur City • Conveyance facilities: conveyance pipeline to El Tur City • Distribution networks: existing piping networks for consumers are utilised as they are. For increasing future demands, a new network will be constructed in the city, although it is out of scope of the project.	• Water source: Nile River water[*2] • Conveyance facilities: conveyance pipeline between Abu Rudeis and El Tur through the pipeline between Suez and Abu Rudeis. This new pipeline has already been installed. This is also used to convey the water to Sharm El Shaikh.
Plan 4	• Water source: intake wells closer to the irrigation fields • Conveyance facilities: conveyance pipeline to a distribution water reservoir in the near irrigation fields • Irrigation system: land reform and drip irrigation system will be installed for crop production in the fields, although the system is out of scope of the project. • Crop intensity in the projects is assumed to be 180%, referring to the North Sinai Agricultural Integrated Rural Development Project. • The allotment of crop production in the project fields is set up as follows[*3]: □ One-third of the fields is for cereal crops, represented by wheat and barley. □ One-third is for fruits, olive and orange. □ One-third is for vegetables, tomato and watermelon.	• Agricultural production in rainfed fields is proposed in the NPDS, although the areas for the production are not identified in the plan.[*4]

Note: *1 These pipelines are utilised for conveyance of the water from the proposed wells. However, the costs of these pipelines are considered as sunk cost, because they are already existing when the proposed project is implemented in the future.

*2 The water sources will be utilised in project sites along the Nile River water pipelines between an intake of Nile River and Suez, once the proposed project is implemented and the water source for the project sites need not to be conveyed to the project sites.

*3 These assumptions are discussed in Section 15.3.2.

*4 It is considered that there is no production in the project sites under the "without-project" conditions.

16.1.4   Criteria of Evaluation

For both economic and financial evaluations, the following criteria and assumptions are applied to calculate evaluation indicators in this study.

1) Schedule and Evaluation Period

(1) Base Year | Beginning of 1999

(2) Construction Period | The first year of 1999 is for detailed design, and after the second year construction period is different from one project to another

(3) Disbursement Schedule | Disbursed in corresponding to construction schedule

(4) Economic Life | 25 years after the completion of the project

(5) Evaluation Period | 25 years after the completion of the major works

(6) Timing of Benefits Accruing | After the completion of the first stage of the project. In agricultural projects, the matured benefit is attained in five years later regarding cereals and vegetables and nine years regarding fruits after the completion.

2) Growth till Target Year 2017

(1) Population in South Sinai

| 1996 (census year): | 54,500 |
| 2017: | 299,200 |

(2) Economy

| GDP growth rate: | 6.9% (1998-2017) |
| GDP per capita growth rate | 4.8% (1998-2017) |

The growth rate is quoted from "The Fourth Five-year Plan (1997/98-2001/02)"

3) Other Criteria

(1) Price Level | Cost and benefits of the project were set at the beginning of March 1998.

(2) Prevailing Exchange Rate | LE3.39 per US$1.00 at the official rate

(3) Opportunity Cost of Capital | 10% per annum

16.2 Economic Evaluation

16.2.1 Procedure and Basic Conditions

1) Procedure of Evaluation

The economic evaluation is conducted in accordance with the conventional methodology. At the first stage of the evaluation, the two major components, that is, cost and benefit, have to be identified for quantification. The costs for the proposed projects are estimated regarding initial construction cost, operation and maintenance (O/M) cost, and replacement cost on the basis of market prices. They are converted to economic value applying conversion factors.

The procedures of benefit estimation are classified into two ways, i.e., water supply schemes of "Plan 1 to 3" and agricultural schemes in "Plan 4". Fig.16.1.1-1 shows this procedure in an allow diagram. In water supply schemes, the benefits of water are estimated through the "least cost alternative system" method. If the proposed project is not implemented in the project site, the alternative system should be introduced to fulfil the water demand in the target areas. This system must be any other minimum cost scheme than the proposed system from the economic point of view. For the proposed project, the water cost based on the alternative system is regarded as benefit for the proposed project. This was discussed in Section 16.1.3. The alternative systems for Plan 1 to 3 were justified in consideration of regional characteristics. Hence, it must be considered carefully that the proposed water resources projects are only the portions of the total supply schemes, and do not include water distribution networks.

In the irrigation schemes, the benefits of water accrue from crop production. The full benefits of irrigation schemes are estimated as net income of crop production, that is, gross income applying farm gate price minus production cost. However, the proposed projects do not include land consolidation and irrigation system. Thus, the net benefits of the projects are made by deduction of the irrigation system portions from the full benefits.

2) Basic Conditions

In estimating the economic benefit, the following criteria and assumptions are applied to transfer the financial values of the project benefits to the economic ones.

(1) Transfer Payments

Market values are usually distorted by transfer payments such as taxes and subsidies. These payments are transferred to the government, which acts on behalf of the society. Then, they should not be treated as economic cost. These have to be eliminated from the market values of cost and benefit as a whole. In Egypt, the taxes concerning to the construction works are enumerated as follows: the value-added tax, income tax, customs duties, local taxes, etc.

(2) Shadow Wage

Prevailing wages of skilled workers are considered to reflect an opportunity cost of labour, because the workers are usually shortage in the labour markets. Therefore, the shadow wage rate of skilled workers is set up as 1.0. On the other hand, unskilled workers are in excess in the labour markets, since the project areas has excess workers in condition of unemployment and underemployment. Thus, the shadow wage rate of unskilled workers is assumed at 0.6 of legislated wage rate, referring to the project reports concerned.

(3) Conversion Factor

All the costs involved in every project have to be measured as economic costs, i.e., the real costs or "opportunity costs" incurred from the viewpoint of the national economy. It is clearly impracticable to trace procurement sources for all the project inputs, particularly in the pre-master plan stage. Thus, taking this situation into consideration and referring to Table 16.2.1-1, the economic costs are assumed to be approximately 90% of the financial costs for local portions. This rate is called as standard conversion factor (SCF).

(4) Land Value

Land areas expropriated for stem piping route and pumping stations are free of charge financially. In economic evaluation, however, land should generally be evaluated on the basis of productivity of the land for productive plots such as crop cultivation and balance of supply and demand for non-productive land such as residential plots. Yet, in South Sinai, most lands expropriated for the projects are not utilised for productive activity. In economic evaluation as well, accordingly, the value of these lands will be evaluated as nothing even in the future.

16.2.2 Benefit Estimation

1) Benefit of Water Supply Projects

Under without project condition, the water supply system of the minimum cost is planned to estimate a marginal cost for the project areas in this study, as mentioned before. Taking into account of the water resources availability, the following systems could be the most applicable and realistic in the project areas.

(1) Plan 1

In the target areas, the Nile River Water Piping System is already laid along the West

Coast. In the future, the new lines will be constructed along the existing pipeline to cope with increasing water demand in the west cost areas down to Sharm El Sheikh.

Sinai Development Authority (SDA) supplies the Nile River Water to the individual water supply undertakers such as city governments, i.e., Ras Sudr, Abu Zenima and Abu Rudeis. The SDA provides water free of charge financially, but the unit water cost is estimated at LE3.07/m³ in 1997 on the basis of the data presented by SSDA as shown in Table 16.2.2-1. The unit cost is re-estimated at LE3.34/m³ on average for coming 25 years in consideration of the future increasing water requirement as shown in the table.

Applying the conversion factors, the above financial unit water value of LE3.34/m³ is converted to LE2.69/m³ in economic terms as shown in Table 16.2.2-1. The annual benefit of Plan 1 is estimated as a product of this economic unit water value and the total water demand. According to the implementation schedule, the project benefit is expected to start in 2004. Since the water demand of the three cities is estimated at 1.67 million m³/year in 2004, the total benefit is expected to be LE4.50 million. In the same manner, the total benefit in 2017 of the target year is estimated at LE56.19 million per annum.

The Nile River Water Pipeline system provides water sources as wholesale for the three cities, and it does not include the distribution of the water for the individual consumers, which is managed by the respective city governments. The proposed system of Plan 1 also provides water sources for the three cities. Thus, the function of Plan 1 as water resources system is the same as the Nile River Water Pipeline system. Accordingly, the above estimation is regarded as the total economic benefit of the Plan1. Hence, the main pipeline system is utilised as a portion of conveyance system of Plan 1, because the end of the pipeline in Plan 1 is connected to the Nile River Water Pipeline as discussed in Chapter X. The costs of the Nile Pipeline, however, are considered as sunk cost in the economic evaluation, because all these facilities are already implemented before the proposed projects install in the future.

(2)   Plan 2

As the existing town facilities and hotels get domestic and municipal water through seawater or brackish water, the desalination system is the most realistic and applicable in urban areas along the East Coast. There are no other water resources except seawater and brackish water. Thus, the new water demands are covered by water supply systems of which water sources are provided with desalination system.

The water cost is calculated through a model study. The flat rate of fresh water is

estimated at LE3.94/m³ in economic terms, as shown in Table 16.2.2-2. It is segregated into LE1.48/m³ of capital portion and LE2.46/m³ of O/M portion.

Incidentally, the existing desalination plants are managed at the following generating costs: LE18/m³ by old evaporation system and LE6~7/m³ by new reverse osmosis system in Sharm El Sheikh; LE7~8/m³ by reverse osmosis system in Dahab; LE22/m³ by evaporation system in Nuweiba. The details of these existing systems are described in Chapter IX.

(3) Plan 3

As mentioned in the description of Plan 1, the new Nile River Water Pipeline is constructed through Sharm El Sheikh in the future. El Tur City is located on the way of this pipeline. In Plan 3, the water resource for the water supply in El Tur City will be provided by other than the proposed project after 2007. The pipeline is one of the convincing water sources for the city. Then, the benefit for Plan 3 is also estimated on the basis of the pipeline water, in the same manner as analysed in Plan 1. Table 16.2.2-3 shows the unit water benefit for Plan 3. It is calculated at LE2.97/m³ in economic terms.

2) Benefit of Irrigation Projects

(1) Component of Agricultural Water Benefit

Agricultural development is important to attain self-sufficiency in the South Sinai Governorate. In the plan, 36,000 feddan (15,120 ha) of cropping fields is cultivated in total by the target year 2017. The detail plan, however, is not reported, so it is not clear at present to identify development areas and cropping system. In this current study, to estimate the agricultural benefit for the development projects, the following crops are selected as typical products in South Sinai. These crops referred to the past records of performance in South Sinai in 1997, as discussed in Section 15.3.2.

(a) Wheat and barley for cereal crops
(b) Olive and orange for fruits
(c) Tomato and watermelon for vegetables

(2) Economic Value of Crops

For valuing economic farm-gate prices, the crops are classified into tradable and non-tradable products in general. Among the above crops, the tradable crops are wheat, orange and tomato, and the non-tradable crops are barley, olive and watermelon.

In terms of tradable crops, the economic prices are estimated applying international prices. To estimate farm-gate prices of crops, the international prices have to be modified in consideration of distribution activities between international market and farm-gate in the project areas. Table 16.2.2-4 shows economic prices of tradable crops. The economic prices of non-tradable crops are converted from market prices to economic prices by means of the SCF of 0.90. The table below shows the financial and economic prices of crops in the proposed project sites.

Farm-gate Prices		(Unit: LE/ton)
Crop	Financial Price	Economic Price
Wheat *	690	690
Barley	410	370
Tomato *	450	570
Watermelon	570	510
Olive	1,430	1,280
Orange *	480	1,260

Note: * Tradable crops

Future cropping patterns under with-project condition were made for most-likely grown crops. For the high cropping intensity, the agricultural mechanisation and soil fertility improvement are prerequisite in the project sites. Thus, the cropping intensity is expected to be around 180%. This plan is set up referring to "The Feasibility Plan on The North Sinai Integrated Rural Development Project (Phase II), JICA".

Crop yield of the selected crops has increased year by year through improved farming practices in irrigation schemes. The yield of the crops under with-project condition is assumed as follows: 2.5 tons/feddan of wheat, 1.5 tons/feddan of barley, 40 tons/feddan of tomato, 10 tons/feddan of watermelon, 7.0 tons/feddan of olive and 7.4 tons/feddan of orange. These are the target yields at the matured final stage.

Production costs of the crops are estimated on the basis of the present farming practices. For economic evaluation, these costs are based on the economic prices, as matter of course. The production costs of the crops are estimated as follows. The details of the production costs are shown in Table 16.2.2-5.

Production Cost		(Unit: LE/feddan)
Crop	Financial Price	Economic Price
Wheat	965	1,262
Barley	336	378
Tomato	8,600	8,989
Watermelon	3,645	3,669
Olive *	1,639	1,659
Orange *	1,107	1,148

Note: * At matured stage

(3) Unit Benefit of Irrigation Project

On the basis of these assumptions and conditions mentioned above, the net returns from crop cultivation are estimated in the table below. Hence, a crop budget is calculated as a difference between gross income and production cost. The details of the budgets are tabulated in Table 16.2.2-6.

Net Return   (Unit: LE/feddan)

	Financial Value	Economic Value
Wheat	760	463
Barley	279	177
Tomato	9,400	13,811
Watermelon	2,055	1,431
Olive *	8,371	7,301
Orange *	2,445	8,176

Note: * At matured stage

In the project areas, the cropping system is assumed as shown in Table 16.2.2-7. On the basis of these assumptions, the economic unit benefit is calculated at LE4,000 per feddan per annum in economic terms at the matured stage.

3) Benefit of Proposed Projects

The total benefits of the respective projects are estimated as a product of unit benefit and total volume for water supply schemes or total crop areas for irrigation schemes. The projects are implemented stepwise toward the target year 2017. The economic benefits of water supply projects are calculated for the respective stages as follows:

Water Supply Projects

	Plan 1	Plan 2	Plan 3
First Stage			
Year of Benefit Accruing	2004	2006	2001
Benefit (LE 1000)	4,502	10,890	1,435
Second Stage			
Year of Benefit Accruing	2009	2009	2004
Benefit (LE 1000)	15,764	16,766	3,208
Third Stage			-
Year of Benefit Accruing	2014	2015	-
Benefit (LE 1000)	35,313	49,574	-

The irrigation projects are also divided into three stages. The economic benefits of irrigation schemes are calculated for the respective stages as follows. The full benefit of irrigation project is expected in the fifth year after crop production starts for cereal and vegetable crops and in the ninth year for fruits. The benefit in the table below shows the compound figures of these stepwise cultivated production. Furthermore, the benefit figures are reduces to 80% of the total benefit, because the proposed projects include the

water resource development schemes and exclude the distribution system.

Irrigation Projects

	Plan 4A	Plan 4B	Plan 4C
First Stage			
Year of Benefit Accruing	2001	2002	2001
Benefit (LE 1000)	219	267	219
Second Stage			
Year of Benefit Accruing	2006	2007	2006
Benefit (LE 1000)	2,651	3,233	2,651
Third Stage			
Year of Benefit Accruing	2011	2012	2011
Benefit (LE 1000)	4,383	5,288	4,383

16.2.3   Economic Cost

1) Conversion of Financial Cost to Economic Cost

The estimates of the proposed projects are described in Chapter XIII. Table 16.2.3-1 shows the summary of the estimates. The estimates, however, are enumerated in market prices, what is called "financial value". In economic evaluation, the financial value is converted into economic value. The procedure of this conversion was already discussed in Section 16.2.1. The economic costs are calculated in Table 16.2.3-1. The costs are summarised in the table below.

Water Supply Projects

	Plan 1	Plan 2	Plan 3
Financial Terms			
Construction Cost (LE Million)	461.5	535.8	17.0
O/M Cost (LE1000/Year)	11,600	15,060	412
Economic Terms			
Construction Cost (LE Million)	397.8	456.5	14.5
O/M Cost (LE1000/Year)	10,434	13,485	369
Ratio of Economic Construction Cost to Financial One (%)	86	85	85

Irrigation Projects

	Plan 4A	Plan 4B	Plan 4C
Financial Terms			
Construction Cost (LE Million)	74.5	86.3	74.5
O/M Cost (LE1000/Year)	2,139	2,529	2,139
Economic Terms			
Construction Cost (LE Million)	64.4	74.6	64.4
O/M Cost (LE1000/Year)	1,923	2,275	1,923
Ratio of Economic Construction Cost to Financial One (%)	86	86	86

2) Disbursement Schedule

The disbursement schedule of the capital investment corresponds with the construction

phase plan that is described in Chapter XIII. The O/M cost also corresponds to the phase plan of main construction work. The annual disbursement of the respective plans is enumerated in the cost streams in Table 16.2.4-1 to 16.2.4-6.

3) Replacement and Residual Values

The pipeline facilities of the respective projects are considered to last 25 years long. Then, the evaluation period is set up as 25 years after the completion. On the other hand, the machinery such as submersible pump and booster pump is considered to last 15 years. These machines have to be replaced during the system's life. In the disbursement schedule, then, the replacement costs of these machines are appropriated every 15 years after the completion of the project.

After the evaluation period of 25 years, the replaced machines will still be able to work well, because they are in their durable period after the replacement. In the evaluation procedure, these machines are evaluated as residual value, and their values are added up into benefit in the final year of the evaluation period.

16.2.4 Economic Efficiency and Prospect

1) Economic Efficiency and Viability

Economic costs and benefits during the economic evaluation period are shown in Table 16.2.4-1 to 16.2.4-6 for Plan 1 to 4C, respectively. Tables also show EIRR, NPV and B/C for the respective projects. The following table summarises all evaluation indices of the projects.

Project	EIRR (%)	NPV (LE Million)*	B/C*
Water Supply Projects			
Plan 1	5.2	-124	0.57
Plan 2	3.3	-181	0.45
Plan 3	24.0	19	2.41
Irrigation Projects			
Plan 4A	0.5	-32	0.44
Plan 4B	0.6	-36	0.43
Plan 4C	0.5	-32	0.44

Note: * Discounted at 10%.

As shown in the table above, the EIRR of Plan 3 is 24.0%, exceeding the opportunity cost of capital, 10%. Although the EIRR of Plan 1 is 5.2% which is less than 10%, this rate proves that the proposed project is more economically efficient than the Nile River Water Pipeline System. Taking difficulty of water supply in South Sinai into consideration, the rate would not be low in the least as compared with other cases in the developing countries. In the report of "Investing in Development, Lessons of World Bank

Experience" in 1985, the water supply project is mentioned as follows: "Water supply and sanitation agencies serving poorer consumers and providing a basic need have rarely been permitted to earn returns higher than 6 to 8 percent". Thus, the rate of 5.2% might be not so low as the general water supply projects in the developing countries. Incidentally, if the estimated costs decreased to 45% of the original estimation, the EIRR would be more than 10%.

The EIRR of Plan 2 is 3.3%. This rate also proves that the proposed project is more economically efficient than the reverse osmosis desalination system. In other words, it is to be desired economically that the implementing agency should promote not the reverse osmosis desalination system but the proposed project. Incidentally, if the estimated costs decreased to 55% of the original estimation, the EIRR would be more than 10%.

The EIRRs of irrigation projects are much less than 10%. From the economic point of view, accordingly, the viable project is Plan 3 only. In consideration of the speciality in Sinai, Plans 2 and 3 might be viable, as well.

2) Prospects of Nile River Water

The Nile River Water Pipelines provide potable water for the areas along Gulf of Suez. The pipelines have been considered as the only measure for water resources for Sinai Peninsula. Thus, the NPSD proposes the water resources for the South Sinai on the basis of these pipelines.

Yet, now that the groundwater resources in the peninsula come to light in this current study, the prospects of water circumstance are bright especially for development of the peninsula. On the other hand, the Nile River Water for the peninsula could be diverted to other areas in main land in Egypt, because the water is naturally scarce in the country. Thus, this phenomenon is quite important for the country not only in political purposes but in economic purposes.

16.2.5   Economic Issues of Water Cost

1) Water Cost of Domestic Water

(1) Component of Domestic Water Benefit

People can not live without water. They constantly strive for water from their livelihood. Unless they can get water good for drinking in their lives, some of them would suffer from water borne diseases. These phenomena are losses for their society from the economic point of view. Water supply system is a prerequisite facility for

keeping away from these phenomena. These phenomena are considered as benefits of domestic water system. They are itemised as follows in general.

(i) Saving of time and tools for procurement of potable water

(ii) Reduction of medical expenses for water borne diseases

(iii) Reduction of working opportunity losses, caused by the situation that sufferers from water borne diseases have to leave from their work.

(iv) Reduction of death caused by water borne diseases

In order to simplify the estimation of these benefits, the World Bank recommends to estimate them through the beneficiaries' expenses for the above losses. It roughly estimates that the ratio of the total benefit to beneficiary's household income is 3 to 5%. Thus, the befit of domestic water is assumed at maximum 5% of beneficiary's household income.

(2) Survey of Household Economy

CAPMAS conducted "Expenditure and Consumption Survey 1995/96". The survey covered the whole country. The household expenditure is analysed for the respective governorates. In spite of that, however, it does not include South Sinai Governorate. Since it includes North Sinai Governorate, the information of household expenditure in North Sinai could be applied to South Sinai.

Table 16.2.5-1 shows the household expenditure by principal expenditure items in North Sinai Governorate. The household expenditure for consumption items was estimated at LE5,748 per annum on average in 1995/96. The total expenditure was also estimated at LE5,852 per annum, including transfer items.

Of the total household expenditure of LE5,852, a housing expense accounted for LE854 or 15%. It includes both housing itself and utilities such as electricity, gas and water. According to the 1991 survey in Table 15.2.3-1, utility expenses occupied LE154 to the housing expenses of LE488, or about 32%. Applying this rate, the utility expenses in Sinai is calculated at approximately LE270. Of the utility expenses, about one-third or a quarter is said to be used for water. Accordingly, the amount of LE90 to LE68 is expended for water consumption in Sinai in 1995/96. These amounts account for 1.6% to 1.2% of the total expenditure, or 1.4% as a mean.

In the same manner, the household economy in urban and rural areas is segregated as follows. The detailed figures are shown in Table 16.2.5-1.

Area	Total Expenditure	Housing Expense	Utility Expense	Water Expense *)
Urban	6,169	906	290	86
Rural	5,535	802	257	77
Total	5,852	854	270	82

Note: *1 Assumed as 1.4% of the total expenditure

The survey does not include any monetary questions of household income. It reports only income sources of sample families. In 60 sample families in North Sinai Governorate, the number of income earners is reported as 93 persons, or the average number of income sources is calculated at 1.6 persons. In urban areas, the number of income earners is 43 persons against 30 households, or 1.4 persons per household. In rural areas, that is 50 persons against 30 households, or 1.7 persons per household. Their income sources are reported as follows:

Area	Wage & Salaries	Agricultural Activities	Nonagricultural Activities	Real Estate Assets	Financial Assets	Other Regular Returns	Total	Number of Samples
Urban	22	11	8	20	0	4	65	30
Rural	22	23	7	23	0	4	79	30
Total	44	34	15	43	0	5	144	60

In urban areas, the number of income sources is reported as 65 for 43 earners, so an income earner has 1.5 sources on average. In rural areas, the number of sources is 79 for 50 earners, so an earner has 1.6 sources.

As discussed in Section 15.2.3, CBE reported that an average salary per worker was about LE3,245 per annum in 1993/94. This income is converted to LE4,250 per annum in 1997, applying the CPI between 1993/94 average and November 1997 shown in Table 15.3.7-1. This amount, however, is not a household income but the average salary per worker. In any case, the average income is lower than the above household expenditure.

In South Sinai Governorate, it is said that an average household income is estimated at LE300 to LE350 per month per family in the beginning of 1998, according to the information from South Sinai Office of WRRI. This value is converted to an annual income as LE3,600 to LE4,200 per family. This range of annual income seems to be smaller than the national average discussed above.

Most households must have more than one income earner as discussed above, although their household income is not clear. Their income should mostly exceed their expenditure in general. Thus, the following two assumptions are set to estimate a

household income in the study area: (a) a household income equals to the total of the household expenditure and savings; and (b) average propensity to save is 5%. Incidentally, Japanese average savings propensity is about 20%, which is said as extremely high in the world. Anyhow, based on the assumptions, the household income is estimated at around LE6,500 in urban areas which comes from LE6,169 over (1-0.05), and LE5,800 in rural areas coming from LE5,355 over (1-0.05).

On the basis of the above household incomes, the ratio of water charge to the income was calculated as follows: 1.3%, viz. LE86 over LE6,500 in urban areas, and also 1.3%, viz. LE77 over LE5,800 in rural areas. These ratios seem to be considerably smaller than the benefit ratio of 5% assumed in Section 16.2.5-1)-(1). This is because the tariff of water supplied by the municipal governments is set up lower than the benefits that the beneficiaries receive from the water supply system. In general, most of water tariffs are said not to reflect the benefits of beneficiaries because of political reasons.

(3) Unit Benefit of Domestic Water

The survey was conducted in the fiscal year 1995/96. Since the evaluation time is set as March 1998, the above household incomes must be converted to the present values. Hence, the CPI is applied to convert the prices. The CPI is projected 361.0 (1986/87 = 100) in March 1998 through regression analysis. Thus, the price went up approximately 9% during this period. Accordingly, the household income is calculated as LE7,100 in urban areas and LE6,300 in rural areas.

On the basis of the above discussion, the unit benefit of domestic water supply system is estimated as the product of the household income and the benefit ratio. Hence, the SCF is applied to household incomes to convert financial value into economic value. The economic household income is calculated at LE6,400 in urban areas and LE5,700 in rural areas. Finally, the economic unit benefit is calculated LE320 per annum per household in urban areas and LE280 per annum per household in rural areas, as shown in the table below.

Area	Household Income (LE/Annum/Household)	Benefit Ratio (% per Household Income)	Unit Benefit (LE/Annum/Household)
Urban	6,400	5	320
Rural	5,700	5	280

In rural areas, a family size was estimated at 4.5 on average in South Sinai Governorate in the 1996 census. Since an average water consumption rate was set up as 120 litres per capita per day, the water consumption volume of the family is calculated at 540 litres per day or 197 m^3 per annum. Thus, the unit benefit of domestic water in rural

areas is calculated at LE1.42 per m³ (or approximate LE1.40 per m³), that is, LE280 per annum per household over 197 m³ per annum per household.

In urban areas, an average water consumption rate was set up as 240 litres per capita per day. This rate, however, includes both water uses of domestic and municipal water. Then, the ratio of domestic and municipal is assumed to be 5:5, referring to the references concerned. The domestic and municipal water rates are approximately 120 litres per capita per day and 120 litres per capita per day.

A family size in urban areas was estimated at 4.1 on average in South Sinai Governorate in the 1996 census. Since an average rate of water consumption was also 120 litres per capita per day, the water consumption volume of the family is calculated at 490 litres per day or 179 m³ per annum. Thus, the unit benefit of domestic water in rural areas is calculated at LE1.79 per m³ (or approximate LE1.80 per m³), that is, LE320 per annum per household over 179 m³ per annum per household.

(4)   Acceptability of Water Cost

In South Sinai, it is quite difficult for people to get potable water under natural conditions without artificial ways. Therefore, the benefit ratio of domestic water, discussed in the previous section, does not always correspond to South Sinai case. In fact, the water values of Plan 1 to 3 are much higher than the acceptable maximum water values calculated in the previous section, as shown in the table below.

Comparison of Water Value   (Unit: LE/m³)

Item	Water Value (LE/m³)	Conditions for making Project viable	
		Cost Reduction (%)	Water Value (LE/m³)
Acceptable Maximum Water Value			
Urban	1.80	-	-
Rural	1.40	-	-
Average Unit Water Cost of Proposed Project			
Plan 1	2.69	-45	5.00
Plan 2	3.94	-55	9.10
Plan 3	2.97	+130	1.25

What percentage of the cost reduction from the original could make the proposed project viable? The answers are calculated in the table above. In Plan 1, 45% reduction from the original estimate would make the proposed project more than 10% of EIRR. In Plan 2, 55% of reduction would make the project viable from the economic point of view. In Plan 3, on the contrary, the proposed project would be viable even if the estimate increased 30% more than the original.

On the other hand, the possibility of water value increase could make the project viable

economically. If the unit water rate has to be more than LE5.00/m³ the EIRR of Plan 1 exceed 10%. This rate is about 1.9 times of the calculated unit water benefit, which is not realistic from the economic viewpoint.

In the case of Plan 2, the unit water rate of the proposed project is calculated at LE3.97/m³. This rate extremely high as compared the acceptable water values in the table above. Furthermore, the rate has to be raised to LE9.10/m³ to make the proposed project viable, which is not realistic either.

2) Water Cost Expected by Urban Economic Sectors

In this section, the net benefits and water consumption volumes of the major economic sectors in South Sinai are considered to investigate the water costs against production or value added of the sectors. This analysis could be useful to consider the selection of development schemes from the economic point of view. In other words, the planner can get the information of the most beneficial schemes for development. This is also to shorten the difference of water cost developed in this project and water costs expected by economic sectors introduced as consumers.

(1) Unit Cost of Industrial Water

(i) Component of Industrial Water Benefit

For industrial development, several types of mining and manufacturing industries are proposed in the NPDS. The outline of the industrial development is mentioned in Section 15.6.2. The mining industries extract kaolin, manganese, copper, coal, albite, albantonite, turquoise, gypsum, limestone, clay and ornamental stone. The manufacturing industries are classified into four types: construction material, chemical product, food product, and mineral product. Besides, the NPDS proposes to introduce small-scale factories in industrial compounds.

In South Sinai Governorate, two zones of industrial compounds are established in El Tur and Ras Sudr, respectively. The each zone has 50 feddans. The above manufacturing industries are allocated in these zones. However, the detailed information is not identified such as production, site, schedule, finance, etc.

The water benefit of industrial development project is estimated as a product of water consumption volume by established type of industry and a marginal cost of supplied water. However, any concrete plans regarding industrial types are not proposed at present so far.

The present water cost of industrial water is estimated on the basis of the actual water charge disbursed by factories in Egypt. However, the water cost information of existing factories is not available, so the information of water use by industrial sector is excerpted from "Average Unit Rates for Industrial Location in Japan" by Japan Industrial Location Centre.

(ii) Allowance for Unit Cost of Industrial Water

Since there are no specific plans regarding industrial development so far, the specific conditions expected in the project were deployed by standard units. Hence, this current study uses what were complied in Japanese units mentioned above, because of data availability. The industrial types are selected to correspond to the NPDS. The standard units are shown in Table 16.2.5-2.

The overall standard units of industrial production and water consumption rate are assumed at US$3.7 million/annum per hector of factory site and 107 m^3/day per ha. These figures are a half of the Japanese standard units as recognised from the table, which was assumed that the factories in Egypt would have more spacious sites than those in Japan have. The reason why the figures of "per factory site" are applied as unit is that the NPDS shows the industrial areas are 50 feddans in both Ras Sudr and El Tur Cities respectively. Accordingly, the standard units are recalculated as LE30 million per annum per feddan and 250 m^3/day per feddan.

The water cost of the selected industrial types is derived from the input-output table, as shown in Table 16.2.5-3 that is also excerpted from Japanese input-output table because of data availability. The rate of water cost against the total production output is estimated at 0.23%, as shown in the table. Thus, the water cost was calculated as LE69,000 per annum per feddan. Water consumption is estimated at 250 m^3/day per feddan or 91,250 m^3/year per feddan. Thus, the average unit cost of industrial water is calculated at LE0.76/m^3. This cost is converted to LE0.68/m^3 (or roughly LE0.70/m^3) in economic terms applying SCF.

Hence, the break-even point from the viewpoint of water consumption allowance is defined as the water cost makes an industrial management have no operation surplus. The rate of operation surplus is reported as around 8.46% of total output of the industrial establishment, as shown in Table 16.2.5-3. Thus, the break-even point is calculated at LE27.40/m^3, that is, LE2.5 million (=LE30 million x 8.46%) of operation surplus over 91,250 m^3. This cost is converted to LE28.10/m^3

($=$LE0.70/m^3 + LE27.40/m^3) in economic terms.

For the industrial establishments, the economic values of water in Plan 1 to 3 are higher than the water costs for which they actually pay in their activities. However, they have much allowance for water costs, because they can stand up to LE28.10/m^3 from the economic viewpoint.

(2) Unit Cost of Tourism Water

(i) Component of Tourism Water Benefit

The water benefit of tourism development project is also estimated as a product of water consumption volume by established facilities and a marginal cost of supplied water. Since the NPDS proposes the number of tourists and accommodations expected by the target years, the water demand could be estimated on the basis of this information. The unit water benefit of tourism is estimated applying the actual water cost disbursed by hotel and restaurant service sectors.

(ii) Allowance for Unit Cost of Tourism Water

The number of foreign tourists to Egypt was 3.9 million in 1996, as shown in Table 16.2.5-4. They stayed 23.8 million nights in total in Egypt. Thus, a foreign tourist stayed 6.1 nights on average. This rate of tourist nights ranged from 4.4 nights in 1995 to 6.1 nights in 1996 during these three years. That is calculated at 5.5 nights on average for the three years.

The total tourists spent LE10.2 million in 1996, according to the balance of payment in Egypt. This means that one tourist spent LE2,600 per one trip and LE430 per night, as shown in the table. The average for these three years was calculated as LE2,500 per trip and LE460 per night. The lodging expense of tourist is assumed to be two-thirds of the total expenses for tour. The average lodging expense is calculated at approximately LE310 per tourist night.

The water cost of the hotel and restaurant sub-sectors is derived from the input-output table, as shown in Table 16.2.5-5 that is also excerpted from Japanese input-output table because of data availability. The rate of water cost against the total production output is estimated at 0.89%, as shown in the table. Thus, the water cost was calculated as LE2.76 per tourist night.

Water consumption is set up as 400 litres per tourist. Thus, the average unit cost

of tourism water is calculated at LE6.90 per m³, that is, LE2.76 per tourist over 0.4 m³ per tourist. This cost is converted to LE6.20 per m³ in economic terms applying the SCF.

As discussed in the industrial water, the break-even point is as follows. The rate of operation surplus is reported as around 9.77% of total output of the tourism services. Thus, the break-even point is calculated at LE75.70 per m³, that is, LE30.29 of operation surplus per tourist night over 0.4m³ per tourist. This cost is converted to LE68 per m³ in economic terms.

For the tourism facilities, the economic values of water in Plan 1 to 3 are lower than the water costs for which they actually pay in their activities. Thus, they could afford to accept the water costs used for the benefit estimation.

3)   Water Cost Expected by Irrigation Projects

Unit benefit of irrigation schemes was described in Section 16.2.2-2)-(iii). The economic benefit was calculated at LE4,000/feddan per annum at the matured stage. Water volume for irrigation scheme is planned to be 2,500 m³/feddan per year, as mentioned in Chapter 10. At the matured stage, thus, the economic net return is calculated at LE1.60 per m³, that is, LE4,000 of unit benefit over 2,500 m³ of water volume. The water cost should be at most LE1.60 per m³ at the matured stage in order that the proposed irrigation projects are viable from the economic point of view. In other words, the value of LE1.60 per m³ is a break-even point in economic terms.

Yet, the crop budget shows a benefit accruing from an entire scheme of agricultural development. In this study, the proposed plan presents only the water source supply portion. Then, the benefit of the proposed water development plan is assumed to be down in proportion to the water source supplying cost against the total project cost of irrigation system. The water costs expected to water source supply system are estimated at about 80% of the total costs. Accordingly, the value of LE1.30/m³, i.e., LE1.60/m³ multiplied by 80%, is a break-even point.

On the other hand, the water costs provided by the proposed projects are estimated at LE2.11/m³ for Plan 4A, LE2.10/m³ for Plan 4B and LE2.10/m³ for Plan 4C, as shown in the table below. These costs clearly exceed the break-even point of irrigation water. Accordingly, the proposed projects are not viable from the economic point of view.

Item	Plan 4A	Plan 4B	Plan 4C
1. Unit Cost of Capital Investment			
- Investment Cost (LE Million)	64.4	74.6	64.4
- Capital Recovery Factor	0.110	0.110	0.110
- Capital Cost Annualised (LE1000/year)	7,084	8,206	7,084
2. O/M Cost (LE1000/year)	1,923	2,275	1,923
3. Total Annual Production Cost (LE1000/year)	9,007	10,481	9,007
3. Water Volume			
- Daily Capacity (m³/day)	11,700	13,700	11,700
- Annual Capacity (1000 m³/year)	4,270	5,000	4,270
4. Unit Production Cost (LE/m³)	2.11	2.10	2.11

Note: Costs are broken down in Table 16.2.3-1.

16.2.6   Conclusion

The proposed projects regarding water supply and irrigation would not be viable except Plan 3 from the economic point of view. The reason is that the total costs are too high as compared with the expected benefit even though the projects are considered to be located in the special areas in South Sinai. Only Plan 3 can be expected to have 24.0% of EIRR, so it could be promoted from the economic viewpoint.

Nile River Water is utilised in the whole areas of the country. It is regarded as only one precious and ample resource of water for the country. However, the Nile River Water can not completely cover plenty of increasing water demand these years. Considering this trend, the benefit of Plan 1 and 3 might increase in the future, because the water value of Nile Water goes up due to its scarcity value. In fact, the economic value of water increases in recent development projects in the main land of Egypt. From the economic viewpoint, the new water resources from the groundwater are important for South Sinai in the future.

As mentioned in the previous analysis, the proposed project of Plan 2 is more economically efficient than the reverse osmosis desalination system. Thus, it is to be desired economically that the implementing agency should promote not the reverse osmosis desalination system but the proposed project.

Regarding irrigation project, the investment and O/M costs of water resources are also too high to realise the proposed projects from the economic viewpoint. Although it is important to promote agricultural projects to raise self-sufficiency rate of food in South Sinai, the crop production under with-project conditions is not realistic economically. The production costs exceed the economic food values imported from other inland areas or from foreign markets. Thus, the crops would rather be cultivated under rainfed fields with farm rain ponds, as far as considered from the economic point of view.

16.3   Financial Evaluation

16.3.1   Procedure and Basic Conditions

The financial evaluation is also conducted in accordance with the conventional method. The component for project evaluation comprises cost and revenue. The costs for the proposed projects are estimated applying the market prices in South Sinai. They are composed of initial construction cost, O/M cost and replacement cost.

The revenue of the proposed projects accrues from expenses of the water consumers. The consumers pay for water charges in accordance with their water volume consumed and water tariff. The city governments concerned lay down the water tariffs on water consumers in their territories. At present, the city governments cover their city proper by a piped system and the surrounding communities by conveying water by tank lorries in principle.

16.3.2   Revenue for Financial Evaluation

1)   Water Supply Projects

(1)   Present Water Tariff

The water tariffs laid by the respective city governments are shown in Table 16.3.2-1. The water rates in El Tur, Ras Sudr and Sharm El Sheikh are identical completely. In particular, the water rate for domestic use is common in the five cities introducing the metered rate. Furthermore, the rate (LE6.00/m³) for hotel is completely identical among the eight cities. The rates for industrial and commercial uses are different among the cities. In this study, then, these rates are set up applying the weighted average of the rates in eight cities concerned to the respective plans. Consequently, the unit charge of the respective consumer types is calculated as follows.

(Unit: LE/m³)

Type of Consumer	Plan 1 Ras Sudr, Abu Zenima, Abu Rudeis	Plan 2 Nuweiba, Taba	Plan 3 El Tur
Domestic			
Urban	0.183	0.030	0.183
Rural	0.178	0.067	0.178
Industrial	1.00	-	1.00
Hotel	6.00	6.00	6.00

(2)   Unit Revenue from Water Consumers

The revenue from water supply services is calculated as a product of water volume consumed and unit prices settled in the water tariffs. As discussed in the previous

section, the average unit volume of water consumption is set up and calculated as monthly and annual volumes as follows. The details of water demand are explained in Chapter X.

Type of Consumer	Unit	Annual Volume	Monthly Volume
Domestic			
Urban	m³/household	179	14.7
Rural	m³/household	197	16.2
Industrial	m³/feddan	90,000	7,500
Hotel	m³/tourist [*1]	102	8.4

Note: *1 Occupation rate (70%) of hotel room is taken into account.

The unit revenue is calculated as a product of unit rate (LE/m^3) and unit water consumption volume for consumer types. The table below shows the annual unit revenue of the respective consumers.

Type of Consumer	Unit	Plan 1	Plan 2	Plan 3
Domestic				
Urban	LE/household/year	32.76	5.37	32.76
Rural	LE/household/year	35.07	13.20	35.07
Industrial	LE1000/feddan/year	540	-	540
Hotel	LE/tourist/year	102	102	102

2) Irrigation Projects

The revenue of the proposed irrigation projects is estimated applying the same procedure done in the economic evaluation. However, the values of all items are evaluated in market prices. The net returns of selected crops are already estimated in Section 16.2.2-2)-(iii). The net returns in financial terms are shown in Table 16.3.2-2. They are as follows: LE760/feddan for wheat; LE279/feddan for barley; LE9,400/feddan for tomato; LE2,055/feddan for watermelon; LE8,371/feddan for olive; and LE2,445/feddan for orange.

3) Revenue from Proposed Projects

The total revenues of the respective projects are estimated as a product of unit price on the water tariff and total volume for water supply schemes or total cropping areas for irrigation schemes. However, the total revenue are reduces in proportion to the ratio of the construction cost of the proposed schemes against the total construction cost of the complete water supply system for the end users. These ratios are shown in the table below. Furthermore, the projects are implemented stepwise toward the target year 2017. The total revenue of water supply projects are calculated for the respective stages as follows:

Water Supply Projects

	Plan 1	Plan 2	Plan 3
Ratio of Project to Entire Scheme	70%	80%	20%
First Stage			
Year	2004	2006	2001
Revenue (LE 1000/Year)	2,226	7,874	59
Second Stage			
Year	2009	2009	2004
Revenue (LE 1000/Year)	4,302	9,592	109
Third Stage			-
Year	2014	2015	-
Revenue (LE 1000/Year)	6,728	12,772	-

The irrigation projects are also divided into three stages. The financial revenue of irrigation schemes is calculated for the respective stages as follows. The matured revenue of irrigation project is expected in the fifth year after crop production starts for cereal and vegetable crops and in the ninth year for fruits. The revenue in the table below shows the compound figures of this stepwise cultivated production. Furthermore, the benefit figures are reduced to 80% of the total benefit, because the proposed projects include the water resource development schemes and exclude the distribution system.

Irrigation Projects

	Plan 4A	Plan 4B	Plan 4C
First Stage			
Year	2001	2002	2001
Net Income (LE 1000/Year)	131	159	131
Second Stage			
Year	2006	2007	2006
Net Income (LE 1000/Year)	2,082	2,538	2,082
Third Stage			
Year	2011	2012	2011
Net Income (LE 1000/Year)	3,391	4,092	3,391

16.3.3 Investment and Management Cost

1) Construction Cost

The estimates of the proposed projects are described in Chapter XIII. Their summary is compiled in Table 16.2.3-1. The total costs of the respective Plans in market prices are summed up as follows:

Water Supply Projects

Item	Plan 1	Plan 2	Plan 3
Financial Terms			
Construction Cost (LE Million)	461.5	535.8	17.0
O/M Cost (LE1000/Year)	11,600	15,060	412

Irrigation Projects

Item	Plan 4A	Plan 4B	Plan 4C
Financial Terms			
Construction Cost (LE Million)	74.5	86.3	74.5
O/M Cost (LE1000/Year)	2,139	2,529	2,319

2) Disbursement Schedule

The disbursement schedule of the capital investment corresponds with the construction phase plan that is also described in Chapter XIII. The O/M cost corresponds to the phase plan of main construction work. The annual disbursement of the respective plans is enumerated in cost stream form in Table 16.3.4-1 to 16.3.4-6.

3) Replacement and Residual Values

As discussed in the economic evaluation, the machinery is replaced during the evaluation period of 25 years after the completion. Thus, the replacement costs of the machinery are appropriated every 15 years after the completion of the project. After the evaluation period of 25 years, however, the replaced machines will still be able to function, because they are in their durable period after the replacement. In the evaluation procedure, these machines are evaluated as residual value, and their values are added up into revenue in the final year of the evaluation period.

16.3.4 Financial Efficiency and Prospect

1) Financial Efficiency and Viability

Financial costs and revenues during the evaluation period are shown in Table 16.3.4-1 to 16.3.4-6 for Plan 1 to 4C, respectively. Tables also show FIRR, NPV and B/C for the respective projects. The following table summarises all evaluation indices of the projects.

Project	FIRR (%)	NPV (LE Million)	B/C
Water Supply Projects			
Plan 1	-	-299	0.10
Plan 2	-	-327	0.15
Plan 3	-	-15	0.10
Irrigation Projects			
Plan 4A	-	-38	0.34
Plan 4B	-	-42	0.33
Plan 4C	-	-38	0.34

Note: * Discounted at 10%.

As shown in the table above, the FIRRs of the all projects are negative. From the financial point of view, accordingly, no projects are viable.

2)   Prospects of Proposed Projects

The reason why all the projects are not viable is too small revenue as compared with the project costs. If it is wished by means of only revenue increase that the water supply projects were made to have the FIRR of more than 10%, the water prices for all consumers would be increased ten times more than the present tariff. On the other hand, it would be possible to make the projects viable by means of only subsidy for the costs. The analysis says that would be made by the covering almost 90% of the costs not only of construction but also of O/M and replacement.

In the case that the government covers the whole capital cost, what percentage has to be covered by the government to exceed 10% of FIRR? According to the analysis, the answer is that approximately 50% of the O/M costs have to be covered by the government as grant. In fact, the revenue of Plan 1 covers less than 40% of the O/M cost in the year 2004 as shown in Table 16.3.4-1. Even in the target year, the revenue covers around three quarters of the O/M costs.

Regarding the irrigation projects, the following conditions have to be satisfied for the proposed irrigation projects to be viable from the financial point of view. If the net returns of crops exceed three times more than the present ones, the projects might be viable. If nearly 70% of the respective costs of construction, O/M and replacement are covered by the government as subsidy, the projects could become viable from the financial viewpoint.

16.3.5   Conclusion

The proposed projects regarding water supply and irrigation would not be viable from the financial viewpoint, if the projects are based on the "cost-recovery" policy under the present tariff and financial situation. The total costs are greatly in excess of the revenues from the management of the proposed projects. Thus, the projects can not be managed without any financial supports by the government.

In the water supply projects, it might be difficult to raise the rates of water tariff because of the NPDS policy. If so, the following financial way would be necessary, that is, the capital costs of the projects are covered by the government and the O/M costs are covered by 50% of the government. The rest 50% of the O/M costs is covered by the revenue from the water charges on beneficiaries under present tariffs. In that case, the FIRR could exceed 10%. Although this is a heavy burden for the government, there is no way to bring the proposed projects into fruition.

In the irrigation projects, it might be impossible for the beneficiaries to get the net returns

of three times more than the present ones. For making the projects having more than 10% of FIRR, thus, 70% and more subsidies than the all costs have to be committed by the government.

16.4   Socio-Economic Impacts

16.4.1   Improvement of Living Standard and Public Hygiene

Scarcities of water resources have been experienced for the populace in South Sinai for long time. They cower in fear whenever the lack of water recall their experience, and they have been exposed to unhygienic conditions during the water-lacking period.

Implementation of the groundwater development projects will relieve the populace from the scarcities of pure potable water. This will result in a pervasive and positive mental climate among inhabitants in the peninsula. They can enjoy life and indulge in industrial activities with little worries of water scarcities.

16.4.2   Retrenchment of Nile River Water Consumption in South Sinai

The Nile River Water is utilised in the whole areas of the country. It is regarded as only one precious and ample resource of water for the country. However, the Nile River Water can not completely cover plenty of increasing water demand these years. Considering this trend, the groundwater in the Sinai Peninsula might be considered as worthwhile property for the country in the future, because the water value of Nile River Water goes up due to its scarcity value. In fact, the economic value of water seems to increase in recent development projects in the every territory of Egypt. Thus, water will be hard to come to hand to country sides far from the Nile River. From the socio-economic viewpoint, the new water resources from the groundwater become more important for South Sinai in the near future.

16.4.3   Promotion for Bedouin People to Settle Down

The water resources development projects of Plan 5 aim at supplying potable water for rural ethnic people, particularly for Bedouins. It is said that the majority of inhabitants in South Sinai Governorate are Bedouins and their descent. Some of them have already changed to settle down in urban and/or rural areas, but others are still moving around among the Sinai Peninsula and the surrounding countries. The government promotes them to settle down in their community areas in the NPDS. The water development projects would be a key issue to push the government policy of this settlement promotion.

16.4.4   Promotion of Rural Industry

There are many potential areas for industrial development along the coast areas of Suez and Aqaba. The NPDS presents to settle infrastructures for industrial promotion in South Sinai. Installation of water resources is one of the key issues for industrial development in the peninsula. In the NPDS the water resources rely on the Nile River Water Pipelines, because of no alternatives in the most areas in South Sinai. However, the ascertainment of the groundwater existence gives the NPDS the new alternatives regarding water resources.

It would be difficult that this invisible benefit is quantified. The existence of the new water resources might be beneficial not only for South Sinai but for the country, because the water resources are lacking everywhere in the country. Anyhow, the new resources confirm the coming industrial establishments such as tourism and manufacturing to mitigate the scarcity of water in the peninsula. Setting aside the question of financial issues, the proposed projects might alleviate economic imbalance between the peninsula and the main land of Egypt.

16.4.5   Increase in Job Opportunity

The implementation of the proposed projects will create opportunities for temporary jobs during the construction period. Temporary workers and some construction materials will be procured not only from the local labour market but also from the main land's markets.