C. Demand-oriented industries: those which supply durable and other consumer goods to the regional population.

Of these strategic industries, those whose location in the Project Area is considered appropriate (some of them already exist) are listed on Tables 4-3-1 through 4-3-3.

For successful implementation of industrial projects, the following development patterns are assumed:

(i) In the primary sector, fishery development will precede, then exploitation of some minerals and agricultural development will take place,

(ii) In the initial stage of development, economic infrastructure such as roads and community facilities will be built first, and

(iii) Resource-based industries will be located in rural areas and supporting industries will be established where they are needed, that is, in the regional development center, in the district development centers, in the sub-district development centers, or at the settlement communities as will be defined in Section 4.8 of this chapter. Most of the demand-oriented industries will be located in Aswan City.

With this in mind, a tentative geographical distribution of development has been drawn up and is shown in Figure 4-3-1.

Mining and manufacturing development in the Project Area needs to be an integral part of the well-balanced overall industrial development of Aswan Governorate as a whole and, therefore, resource-based and supporting industries will have to be located also in Edfu, Nasr and Kom Ombo, provided that many of manufacturing industries will, for the time being, locate themselves in Aswan City in consideration of such factors as economy of inter-industrial linkage, market access, manpower availability and infrastructure. Scattered locations of small-scale factories impair investment efficiency, particularly in the early stages of development, and hinder subsequent development speed. It is desirable that mining and manufacturing in Aswan City, the regional development center, be developed to an adequate extent before further developmental efforts are extended to other parts of the Project Area and of the Governorate.

4.3.2 Development Targets

Development targets of the Project Area shown in Table 4-3-4 are based on the development framework already presented in Section 3.2 of Chapter III. The mining and manufacturing sector contribution to the gross regional domestic products (GRDP) of Aswan Governorate is expected to increase from an estimated 21% in 1978 to 32% by the year 2000. The mining and manufacturing share of total employment in the Project Area is projected to rise from an estimated 17% in 1978 to 22% by the year 2000. Industrial labor productivity will be improved remarkably, by an average annual rate of 6.5%, to about 6.5 times in 1979 prices by 2000.

Table 4-3-1 Examples of Resource-based Industries

A-1 Fish Resources	A-2 Agricultural Products	A-3 Minerals	A-4 Water & Electricity
- Fish Processing 31141 Prepared & Tinned Fish 31142 Salted & Dried Fish	- Slaughtering & Meat 31111 Meat Processing & Freezing 31112 Poultry 31113 Preserved Meat - Dairy Products 31121 Butter & Cheese 31122 Processed Milk - Fruits & Vegetables 31131 Preserved Vegetables 31132 Jams & Fruit Jelly 31133 Fruit Juice - Edible Oils 31151 Vegetable Oils - Sugar 31181 Refined Sugar - Animal Feedstuff 31221 Feedstuff - Leather Goods 32331 Shoes & Bags 32332 Other Leather Goods - Perfume 35232 Perfume 35117 Dyestuff	- Metallic Ores 23010 Iron Ore 23020 Copper Ore 23022 Chromium Ore 23025 Gold Ore - Stones 29010 Marbles & Granite 29011 Limestone, Aggregate & Clay - Ceramics & Glass 36101 Potteries & Porcelain 36201 Sheet Glass 36202 Glass Container 36911 Building Brick & Tile - Limestone Processing 36921 Cement 36922 Quicklime 36992 Processing of Marble & Granite - Phosphate Rock Processing 35121 Phosphatic Fertilizers - Ferro-alloys 37101 Ferro-silicon, Manganese & Chromium	- Ammonia Synthesis 35115 Ammonia 35121 Nitrogenous Fertilizers - Electrolysis 37201 Aluminium Metal 37202 Refined Copper 35117 Calcium Carbide

Note: Numerical codes correspond to ISIC codes.

Table 4-3-2 Examples of Supporting Industries

B-1 Fisheries	B-2 Agriculture	B-3 Building & Construction	B-4 Repairs
- Shipbuilding 38411 Steel & Wooden Shipbuilding 38412 Ships Repairs	- Insecticides & Fungicides 35121 Insecticides & Fungicides - Agricultural Machinery & Tools 38221 Harrows & Ploughs 38222 Seeders & Planters 38224 Rakes 38226 Tractors 38111 Hand Tools - Irrigation 37101 Steel Tubes & Pipes 38299 Water Pumps 38311 Small Electric Motors & Transformers 35602 Plastic Tubes & Pipes	- Cement Utilization 36991 Concrete & Cement Products - Iron & Steel 37101 Steel Re-inforcement Bar 37102 Iron Castings - Metal Products 38113 Building Hardware 38131 Steel Water Tanks 38191 Tin Cans - Paints 35211 Paints - Structures 38131 Steel Structures	- Automobile 38433 Parts Manufacturing & Repairs - Electrical Machinery 38311 Parts Manufacturing & Repairs - Tyres 35512 Tyre Retreading

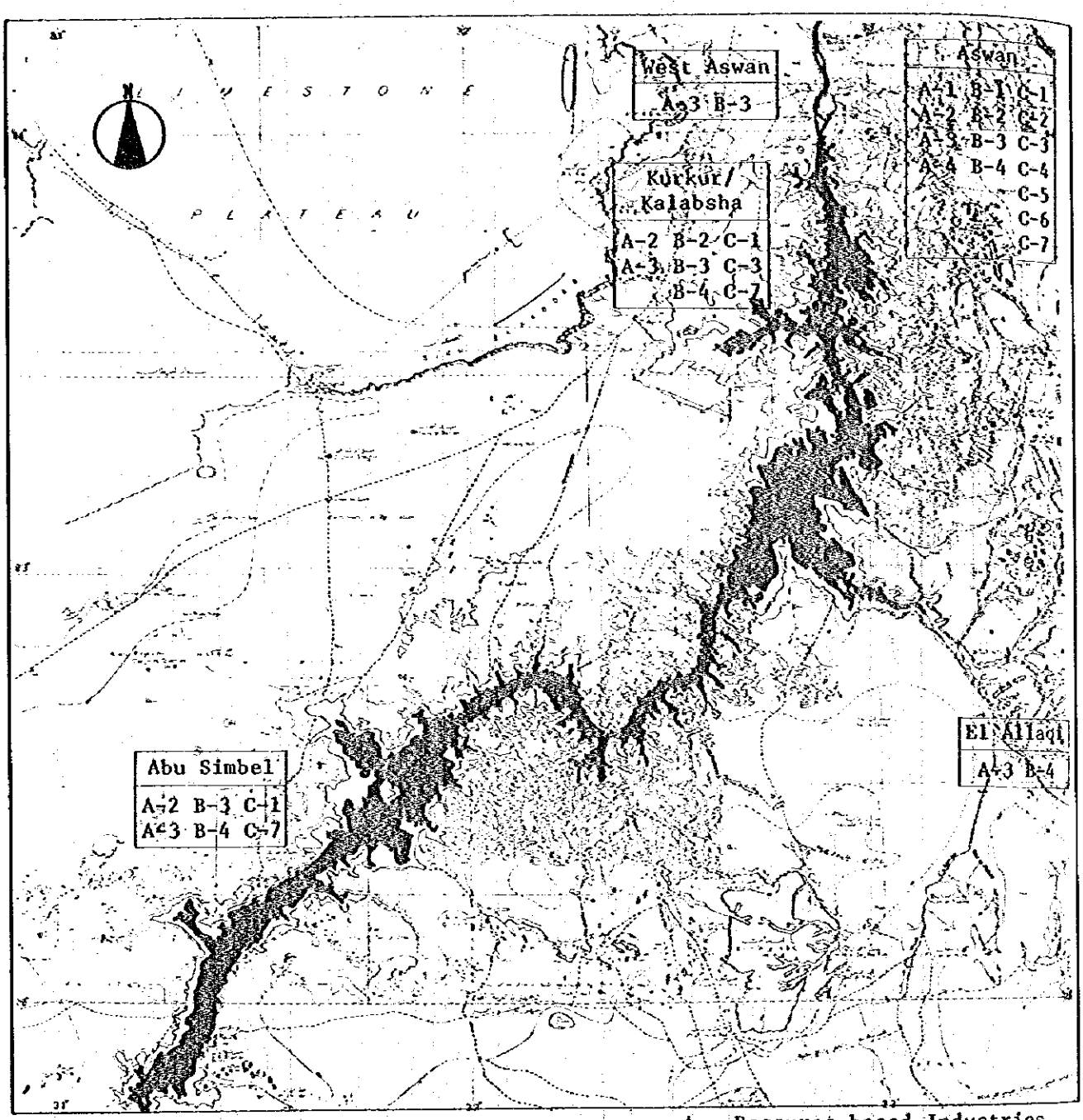
Note: Numerical codes correspond to ISIC codes.

Table 4-3-3 Examples of Demand-oriented Industries

C-1 Food & Beverages	C-2 Textiles	C-3 Wooden Products	C-4 Paper & Printing
31161 Flour Mill	32201 Ready-made Garments	33201 Wooden Furniture	34201 Printing
31171 Bakery	32141 Blankets & Carpets		
31172 Confectionary			
31174 Pasta			
31342 Soft Drinks			
31331 Beer			

C-5 Chemical Products	C-6 Metal Products	C-7 Other Products
35231 Soap & Detergents	38112 Aluminium Wares	39096 Copper Handicrafts
35601 Plastic Wares	38291 Cooking Stoves	39099 Other Handicrafts
35603 Plastic Bags		

Note: Numerical codes correspond to ISIC codes.



INTEGRATED REGIONAL DEVELOPMENT PLAN OF THE HIGH DAM LAKE AREA

Figure 4-3-1

Geographical Distribution of Mining and Manufacturing Activities

0 10 20 30 40 50 60 70 80 90 100(km)

A. Resource-based Industries

- A-1 Fish Resources
- A-2 Agricultural Products
- A-3 Minerals
- A-4 Water and Electricity

B. Supporting Industries

- B-1 Fisheries
- B-2 Agriculture
- B-3 Building and Construction
- B-4 Repairs

C. Demand-oriented Industries

- C-1 Food and Beverages
- C-2 Textiles
- C-3 Wooden Products
- C-4 Paper and Printing
- C-5 Chemical Products
- C-6 Metal Products
- C-7 Other Products

Table 4-3-4 Development Targets of Mining and Manufacturing Sector

	Unit	1982	1987	1992	1997	2000
GRDP of Mining & Manufacturing Sector	£E mil.	13.0	28.3	80.9	194.1	320.1
Employment	1,000	9.4	14.8	28.8	44.4	55.0
Labor Productivity	£E	1,379	1,911	2,808	4,371	5,818
Required Investment		(1983-87)	(1988-92)	(1993-97)	(1983-97)	
	£E mil.	79	129	219	427	

Source: The JICA Study Team.

In order that these targets be reached, development investments in the mining and manufacturing sector to a total amount of £E 495 million will be necessary during the 18 years from 1980 to 1997. Table 4-3-5 presents investment plans for each of the industrial sub-sectors in accordance with the previously discussed strategy.

Table 4-3-5 Estimated Investment Requirements by Sub-sector

(Unit: £E million 1979 prices)

ISIC Code	Sub-sector	1980-87	1988-92	1993-97	Sub-total
23	Metallic Ore	2.5	10.5	32.0	45.0
29	Other Minerals	2.8	3.5	4.2	10.5
31	Food, Beverages and Agro-products	5.2	19.4	26.9	51.5
32	Textile, Clothing and Leather Goods	0.3	0.6	0.8	1.7
33	Wooden Products	0.1	0.5	0.4	1.0
34	Pulp, Paper and Printing	0.2	0.7	0.4	1.3
35	Chemical Products	3.4	13.7	37.5	54.6
36	Non-metallic Mineral Products	60.4	30.9	43.8	135.1
37	Basic Metals	2.8	28.5	52.7	84.0
38	Metal Products and Machinery	7.1	8.2	8.6	23.9
39	Other Manufactured Goods	0.1	0.3	0.5	0.9
-	Industrial Areas	6.0	12.3	11.0	29.3
	Total	90.9	129.1	128.8	438.8

Source: The JICA Study Team.

Conditions for the realization of these investment plans will be:

(i) That development of metallic minerals and non-metallic minerals not be limited to the Project Area but include Southern Red Sea Governorate, e.g., area along the Aswan-Berenice Road,

(ii) That investments for these minerals development include geological exploration costs,

(iii) That the Aswan Iron Mines, now closed, be reopened,

(iv) That investments in agricultural products processing be made primarily when agricultural development in the Project Area has progressed,

(v) That investments in demand-oriented industries (such as garments, wooden products, paper and pulp, and printing) be carried out actively when the population of Aswan City exceeds 300,000,

(vi) That chemical products and basic metals development center around electric power consuming industries (electrolysis, electrothermal melting), and that the timing of investment be when power supply elsewhere in the country has become sufficient to permit increased power consumption in Aswan Governorate, i.e., after 1990,

(vii) That major non-metallic mineral products include cement and other building materials, and that investment in some of these industries be made prior to the start of large-scale construction works in the Project Area,

(viii) That investments in metal products and machinery industries be carried out actively when the implementation of this Master Plan progresses to a certain degree and the market expands (that is, in the latter half of the 1980s), and that some of these industries be relocated to the Project Area from northern Egypt under the decentralization policy,

(ix) That industrial development in the Project Area be accomplished under government leadership, although investments shown on Table 4-3-6 will be made by both the public and private sectors, including joint-venture enterprises, and

(x) That approximately 7% of total investment will be directed toward improvement of the industrial infrastructure, namely, construction of industrial estates in Aswan City and/or its vicinity.

4.3.3 Problems and Recommended Solutions of Mining and Manufacturing Development

The factors which can hinder the accomplishment of industrial development in the Project Area will include problems of market size, technology and manpower, development investment funding, development of other economic sectors, economic development in the neighboring areas, climatic conditions, and infrastructure. In addition, each project has its own specific problems.

Table 4-3-6 Investment Fund Requirements for Mining and Manufacturing Development by Source

(Unit: £E million 1979 prices)

	1980-87	1988-92	1993-97	1980-97
Public[1/]	81	97	164	342
Private[1/]	10	32	55	97
Total	91	129	219	439

Note: 1/ Includes participation in joint ventures.

Source: The JICA Study Team.

(1) Products Market

Markets for products processed or manufactured in the Project Area can be classified into domestic and export markets. Export markets include those in neighboring countries and those in overseas countries. Of the neighboring country markets, the Sudan may be regarded as a semi-domestic market. Also, the Arabian Peninsula, particularly Saudi Arabia, may be treated as a single separate market after completion of the Aswan-Berenice Road and Berenice Port. Domestic markets may be classified into the following four: the Project Area, Aswan Governorate, Region 8, and the northern area of the country including Cairo and the delta.

Because the market size will have a substantial impact on a project's feasibility, it should be estimated for each type of industry as precisely as possible and the projects which will guarantee the minimum feasibility requirement should be implemented first, although projects such as those of supporting industries, which require by definition preceding investment, may be implemented irrespective of market size.

Various markets have been evaluated for each industrial type, as shown in Table 4-3-7. Needless to say, the evaluation may not be appropriate to some projects. Export market evaluation for each product must be based not only on the product's price competitiveness but also on its non-price competitiveness, e.g., quality, delivery time and servicing. As Table 4-3-7 indicates, industries other than those of resource-based type can expect to find no export markets elsewhere other than neighboring countries.

(2) Technology and Manpower

Egypt, whose technological level is fairly high, has sufficient capability to operate mines and factories in almost all aspects of industrial activity, depending on industrialized countries for the supply of specialized machinery and equipment. The implementation of this development plan will inevitably require the importation from

Table 4-3-7 Potential Markets by Type of Industry

	Resource-based Industries	Supporting Industries	Demand-oriented Industries
1. Export Markets			
The Sudan	○	○	○
Arabian Peninsula	○		
Other Overseas Markets	○		
2. Domestic Markets			
Project Area		◎	
Aswan Governorate	△	◎	◎
Region 8	○	○	◎
North Egypt	◎	○	

◎ Promising
○ Possible
△ Partially possible

Source: The JICA Study Team.

advanced nations of the items shown below, which means that approximately 50 to 60% of the required development investment funds will have to be raised in the form of foreign exchange:

- Special purpose heavy duty lorries,
- Mining equipment,
- Some food processing plants,
- Paper and pulp plants and printing machines,
- Chemical plants,
- Some ceramics manufacturing plants,
- Metal smelting and refinery plants,
- Some machine tools,
- Heavy electrical machinery, and
- Electronic equipment and control devices.

One of the most serious obstacles to the accomplishment of mining and manufacturing development in the Project Area will be manpower availability. Table 4-3-8 presents an approximate distribution by qualification category of net increase of 38,000 in the number of employees from the present to the year 2000.

Table 4-3-8 Approximate Additional Manpower Requirement by the Year 2000 in Mining and Manufacturing Sector in the Project Area

(Unit: Person (%))

Designation	Education and Training Level	Mining Sector	Manufacturing Sector
Professionals	Higher Education, University Diploma	257 (5)	2,630 (8)
Sub-professionals (or technicians)	Secondary Technical Education Plus Technician Training	770 (15)	6,574 (20)
Skilled	Preparatory, Plus Two to Three Years' Training	1,539 (30)	9,861 (30)
Semi-skilled	Primary Education, Plus One to Three Years' Training	1,539 (30)	8,546 (26)
Unskilled	Primary Education or Below	1,026 (20)	5,259 (16)

Source: The JICA Study Team.

Technical education and training programs currently being carried out in Aswan Governorate are summarized below.

- Professionals
  - Name : Kima Institute of Technology
  - Level : Equivalent to B.E. courses (5.5 years)
  - Courses : Chemistry, metallurgy, mechanical engineering and electrical engineering
  - Enrollment: 60 persons/year

- Sub-professionals (or technicians)
  - Name : Aswan Technical School
  - Level : Technician training in 5 years
  - Courses : 10 courses in machine working, automobile repairs and electrical works
  - Enrollment: 250 persons/year

- Skilled and Semi-skilled
  - Name : Three Industrial Secondary Schools (Aswan, Edfu and Kom Ombo)
  - Level : Technical Training in 3 years
  - Courses : Courses in masonry, decorative arts, automobile repairs, house building, plumbing, carpentry, mechanical and electrical works and so on
  - Enrollment: Approx. 400 persons/year each in Aswan and Kom Ombo and 300 in Edfu

As shown in Table 4-3-9, the annual manpower supply capacity of the Governorate indicates substantial shortfalls in the categories of professionals and sub-professionals relative to the expected demands through the year 2000. In order to be self-sufficient in qualified manpower required in the mining and manufacturing sector, the following measures will be necessary in the Governorate:

- Establishment of an advanced course (leading to B.Sc.) to educate and train professionals in the fields of geology and mining, architecture, civil engineering and food processing.
- Expansion of sub-professional training in building and construction trades, and
- Strengthening of skilled and semi-skilled training in mechanical and electrical works.

Table 4-3-9 Demand and Supply of Manpower in the Year 2000 in Mining and Manufacturing Sector

(Unit: person)

Designation	Demand by 2000	Current Level of Supply 1/	Balance
Professionals	2,887	1,200	Minus 1,687
Sub-professionals	7,344	5,000	Minus 2,344
Skilled	11,400		
Semi-skilled	10,085	22,000	Plus 515
Unskilled	6,285		

Note: 1/ Annual outputs from the existing institutions multiplied by 20 years (1980 - 1999).

Source: The JICA Study Team.

The most important of manpower problems in mining and manufacturing development will be to successfully bring experienced managers (executives and plant managers) and engineers from the industrialized northern part of the country and have them resettle in the Governorate. As incentives for resettlement, they not only should be given attractive remunerations and be offered comfortable housing, but also the levels of social and cultural infrastructure of Aswan City should be further developed.

(3) Development Investment Funds

Total development investment funds required under the Master Plan are discussed elsewhere. As far as the mining and manufacturing sector is concerned, the government development funds and foreign investments will have great significance.

As for the government's (public) investment funds, a total of about £E 350 million will be necessary during the period 1980 to 1997. In order that this magnitude of investment be effectively made, resource-based industries and some of the supporting industries are encouraged to be located in the Project Area from the standpoint of industrial decentralization for whole Egypt.

Little may be expected of foreign investments in the immediate future because they are likely to prefer a location close to the markets for economic reasons and generally avoid long distance export routes in order to keep transportation costs down. Therefore, the level of foreign capital inflow will rise only when the national "open door" policy is well established, government measures under such a policy framework are well understood by prospective foreign investors, and some incentives (tax incentive, the discovery of important resources, etc.) are made available.

(4) Development of Other Economic Sectors

It is essential that manufacturing development be well coordinated with the development of other economic sectors, as there will be:

(i) Cases wherein development of other sectors must precede:
- The development of frozen fish, canned fish, and fish meal industries must be preceded by fishery development to the extent that an adequate supply of fish can be guaranteed on a stable and continuous basis,
- The development of vegetable and fruit processing and canning and vegetable oil industries must be preceded by agricultural development to the extent that crops are harvested on a stable basis,
- The development of meat processing and leather products industries must be preceded by the successful implementation of a cattle fattening project,
- The development of metal smelting and ferro-alloy industries must be preceded by exploration and discovery of promising deposits of metal ores and the development of mines,
- The development of ceramics, glass, and cement industries must be preceded by successful mining, with economy, of most of the needed non-metallic minerals, and
- The development of ammonia synthesis, nitrogenous fertilizer, aluminium smelting, and calcium carbide industries must be preceded by development of a surplus electric power supply capacity in the Project Area, namely the High Dam and Old Dam hydroelectric power generation.

(ii) Cases wherein development of manufacturing and other sectors should proceed in parallel:
- Increase in the number of fishing boats = ship building and repairs,

- Extensive use of machinery and equipment of farms = agricultural equipment industry,
- Increased application of fertilizer and agricultural chemicals = nitrogenous and phosphatic fertilizers and agricultural chemicals industries,
- Increased use of motor vehicles = the development of automobile repair, spare parts manufacturing, and tyre retreading, and
- Urban and rural electrification = electrical machinery and appliances repair.

(iii) Cases wherein industrial development should precede somewhat the development of other sectors:
- The development of cement, concrete pipe, plastic pipe and water pump manufacturing must precede irrigation, urban water supply, and sewage system projects, and
- The development of cement, concrete products or secondary cement products, paint, mortar, sanitary ware, brick, tile, and steel reinforcement bar industries must precede the progress of housing and other structural construction projects.

(iv) Cases wherein industrial development depends on overall development (population and income increases):
- Flour mills, bakeries, confectioneries, and beverage bottlers depend on increases in local demand,
- Kitchenwares, tablewares, plastic containers including buckets, soap and detergents, and cooking stoves depend on increased demand for household appliances, and
- Ready-to-wear garments and knitted underclothing depend on clothing demand expansion.

In Cases (ii) and (iii) above, developmental projects should be implemented under a well coordinated plan. Priority should be placed particularly on the industries of Case (ii), delayed development of which could retard development in other sectors.

(5) Economic Development in the Neighboring Areas

Aswan City can also function as the industrial development center for the adjacent regions, including other governorates of Region 8 and the northern part of the Sudan. Industries to process resources available in Region 8 can be located close to the area of resource production. The market will be too small, however, for some of the supporting and demand-oriented industries to be scattered over the regions and these should, therefore, be located in Aswan City to take advantage of industrial clustering therein. Examples include;
- Secondary concrete and cement products
- Steel reinforcement bars
- Steel water tanks
- Tin cans

- Agricultural machinery and tools
- Plastic wares
- Wooden and steel furniture

Industrial integration should also be promoted to the extent possible within Region 8.

(6) Climatic Conditions

Climate in the Project Area is of high temperature and low humidity, conditions difficult for developing spinning and weaving industries. Also, the high temperature in summer discourages any hope for high technology machinery assembly industries, unless whole factories are air-conditioned. Under the intensive summer heat, mining and manufacturing productivity in the Project Area is expected to be lower than in the northern area.

(7) Infrastructure

The elements of the infrastructure which are feared to become bottlenecks in mining and manufacturing development are:

- Mine access roads and other feeder roads,
- Industrial water (in the case of industries located far away from the Nile Valley and the High Dam),
- Communication facilities (intra-regional telephone communication, and telephone and telex communication with Cairo and foreign countries), and
- Housing and other community facilities.

These facilities are not yet adequately developed even in Aswan City. Industrial estates should be first developed in or near Aswan City as a solution to the problems, thereby minimizing the amount of infrastructural investment and facilitating the efficient use of infrastructure.

Additionally important is "invisible infrastructure" such as government and bank services, which are relatively well developed in Aswan City. Also indispensable to mining and manufacturing development will be warehouses with adequate stocks of, and the adequate supply capacity for, the following materials, and with a somewhat more commercialized function than that of the Ministry of Supply:

- Steels,
- Non-ferrous metals,
- Common machine parts, and
- Common electrical parts and tools.

4.3.4 Development Projects for Mining and Manufacturing

(1) Overall Program

Based on the foregoing discussion on development strategies for the mining and manufacturing sector, a tentative schedule of major project implementation is summarized in Table 4-3-10. Care should be taken, however, when interpreting this table because of the following reasons:

(i) Projects shown are only representative of many conceivable ones.

Table 4-3-10 Investment Schedule for Mining and Manufacturing Sector

Code[1]	Project	Proposed Site	Project Cost (£E mil.)	Employment	Possible Implementation Period[2] 1980 82 87 92 97 2000	Premises
A-1	-Fish Processing	High Dam	2.00	215		
A-2	-Slaughtering and Meat Processing	Aswan/ Kalabsha	3.00	400		Cattle Breeding
	-Cold Storage	Aswan/ Kalabsha	0.70	60		
	-Poultry Meat	Aswan/ Kalabsha/ Abu Simbel	0.30	75		
	-Dairy Products	Aswan	0.80	100		Cattle Breeding
	-Preserved Fruits (Fruit Canning)	Aswan/ Kurkur/ Kalabsha	0.50	100		Fruit Growing
	-Fruit Juice (Canning)	Aswan/ Kurkur/ Kalabsha	1.10	180		Fruit Growing
	-Tomato Ketchup and Puree	Aswan/ Kurkur/ Kalabsha	1.20	150		Tomato Growing
	-Vegetable Oils	Aswan/ Kurkur/ Kalabsha	1.20	150		Oil Seed Growing
	-Cane Sugar	North Aswan	10.50	300		
	-Animal Feedstuff	Aswan	3.00	90		Flour Milling and Fish Processing

Notes: 1/ See Tables 4-3-1 - 4-3-3. 2/ A time span during which the project can possibly be implemented.

Code 1/	Project	Proposed Site	Project Cost (£E mil.)	Employ-ment	Possible Implementation Period 2/ 1980 82 87 92 97 2000	Premises
A-2	-Natural Dyestuff	Aswan	0.10	30		Plant Growing
	-Perfume Oil	Aswan	0.10	40		Plant Growing
	-Leather Shoes	Aswan	0.40	90		Tanning
A-3	-Iron Ore Upgrading	Aswan	7.50	900		
	-Copper Ore	South-west El Allaqi	35.00	700		Copper Ore Discovery
	-Chromium Ore	South-west El Allaqi	15.00	400		Chromite Discovery
	-Gold Ore	South-west El Allaqi	3.00	200		
	-Marble Quarries	El Allaqi	0.50	250		
	-Granite Quarries	Aswan	0.30	200		
	-Aggregate Quarries	Aswan/ Kalabsha/ Abu Simbel	1.00	150		
	-Clay Quarries	West Aswan/ Kalabsha	0.15	60		
	-Ceramic Tiles	West Aswan	2.60	200		
	-Ceramic Tableware	Aswan/ West Aswan	3.80	400		
	-Ceramic Sanitary Ware	Aswan/ West Aswan	2.30	200		

Notes: 1/ See Tables 4-3-1 - 4-3-3. 2/ A time span during which the project can possibly be implemented.

(continued on the next page)

Table 4-3-10 (continued)

Code[1]	Project	Proposed Site	Project Cost (£E mil.)	Employ-ment	Possible Implementation Period[2] 1980 82 87 92 97 2000	Premises
A-3	-Porcelain Insulators	Aswan/ West Aswan	2.50	200		
	-Glass Containers	Aswan	4.00	400		
	-Glass Tableware	Aswan	1.50	150		
	-Clay Bricks	West Aswan	1.00	150		
	-Sandstone Bricks and Blocks	Abu Simbel	0.20	80		
	-Cement	West Aswan	50.00	400		
	-Quicklime	West Aswan	3.00	80		
	-Calcium Carbonate	Aswan	1.20	40		
	-Ferro-alloys	Aswan	18.00	700		
A-4	-Nitrogeneous Fertilizers	Aswan	60.00	1,800		Electricity Surplus
	-Aluminium Metal	Aswan	120.00	2,200		Electricity Surplus
	-Copper Metals	Aswan	35.00	500		Copper Mining
B-1	-Shipbuilding and Repairs	High Dam	4.00	110		
B-2	-Insecticides	Aswan	6.50	80		
	-Agricultural Implements	Aswan/ Kalabsha	0.80	70		
	-Agricultural Machinery (Small Tractors)	Aswan	4.80	220		

Notes: 1/ See Tables 4-3-1 - 4-3-3. 2/ A time span during which the project can possibly be implemented.

Code[1/]	Project	Proposed Site	Project Cost (£E mil.)	Employ-ment	Possible Implementation Period[2/] 1980 82 87 92 97 2000	Premises
B-2	-Water Pumps (Assembly)	Aswan	0.80	60		
	-Electric Motors and Transformer (Assembly)	Aswan	0.60	60		
	-Plastic Pipes and Tubes	Aswan	0.60	50		
	-Refractories	West Aswan	4.50	250		
B-3	-Asbestos-Cement Pipes	West Aswan	7.00	100		Cement Prod.
	-Concrete Blocks	West Aswan/ Kalabsha	0.60	80		Cement Prod.
	-Precast Concrete Products	West Aswan	1.00	100		Cement Prod.
	-Prefabricated Housing	West Aswan	4.00	120		Cement Prod.
	-Steel Reinforcement Bars	Aswan	27.00	500		
	-Steel Wire Products	Aswan	1.50	100		
	-Iron Foundry	Aswan	1.30	80		
	-Water Tanks (Steel or Plastic)	Aswan	0.80	50		
	-Tin Cans	Aswan	2.30	90		Canning Industries
	-Paints	Aswan	0.80	60		
	-Steel Structures	Aswan/ Kalabsha/ Abu Simbel	0.45	120		

Notes: 1/ See Tables 4-3-1 - 4-3-3. 2/ A time span during which the project can possibly be implemented.

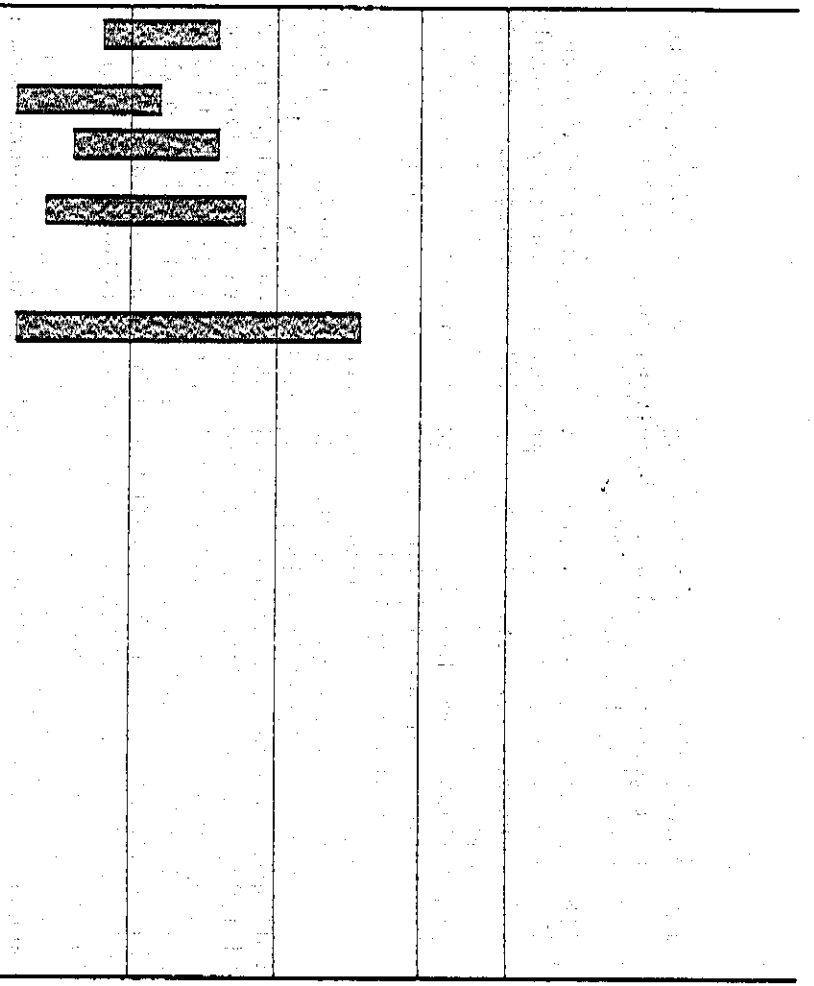
(continued on the next page)

Table 4-3-10 (continued)

Code[1]	Project	Proposed Site	Project Cost (£E mil.)	Employment	Possible Implementation Period[2] 1980 82 87 92 97 2000	Premises
B-4	-Automobile Repairing	Aswan/ Kalabsha/ El Allaqi/ Abu Simbel	1.20	160		
	-Electrical Machinery Repairing	Aswan/ Abu Simbel	0.40	60		
	-Tyre Retreading	Aswan/ Kalabsha/ Abu Simbel	0.30	60		
C-1	-Flour Mill	Aswan	3.50	100		
	-Bakery	Aswan/ Kalabsha/ Abu Simbel	0.90	90		
	-Confectionaries	Aswan	0.45	40		
	-Pastas	Aswan	0.30	80		Flour Mill
	-Soft Drinks	Aswan	1.40	60		
C-2	-Ready-Made Garments	Aswan	0.20	120		
C-3	-Wooden Furniture	Aswan/ Kalabsha	0.20	50		
C-4	-Printing	Aswan	0.70	90		
C-5	-Soap	Aswan	0.30	40		
	-Detergents	Aswan	0.50	70		
	-Plastic Containers	Aswan	1.50	70		

Notes: 1/ See Tables 4-3-1 - 4-3-3. 2/ A time span during which the project can possibly be implemented.

Code[1/]	Project	Proposed Site	Project Cost (£E mil.)	Employ-ment	Possible Implementation Period[2/] 1980 82 87 92 97 2000	Premises
C-5	-Plastic Bags	Aswan	0.50	40		
C-6	-Aluminium Cooking Ware	Aswan	1.30	250		
	-Cooking Stoves	Aswan	0.80	80		
C-7	-Handicrafts	Aswan/ Kalabsha/ Abu Simbel	0.30	100		
Aux.	-Industrial Estates	Aswan/ West Aswan	29.30	-		



Notes: 1/ See Tables 4-3-1 - 4-3-3. 2/ A time span during which the project can possibly be implemented.

(ii) Investment and employment figures are inaccurate due to lack of information and are, therefore, subject to change in the course of further study.

(iii) "Possible Implementation Period" of a project indicates a time span during which the project can possibly be implemented. Estimation of this periods is based on such factors as:
- linkage with other economic sectors
- intra-industrial linkage
- growth of market size
- availability of natural resources, and
- possible future decentralization of Egyptian industries.

As indicated before, great importance is attached to setting up resource-based industries which will include fish processing, agro-products processing, mining and mineral processing, and industrial utilization of electric power, provided that a surplus is realized due to the power development elsewhere in the country. Also emphasized are possibilities of industrial estates, which are expected to accelerate industrial siting in and around Aswan City.

Industrial estates in the Aswan area will include four candidate sites, as shown in Table 4-3-11, and they should be constructed well in advance in order to lessen disorderly industrialization as well as to minimize environmental pollution.

Table 4-3-11 Possible Industrial Estates in the Aswan Area

	Candidate Site	Size (ha)	Type of Industry
1.	Existing Industrial Area in Aswan City 1/	10-20	Repairing, Metal Working Metal Products, Small Machinery
2.	South of Kima Factory 2/	150	Chemical Products, Basic Metals, Food Processing
3.	Aswan-West Bank	150-200	Food Processing, Other Agro-industries, Glass and Porcelain, Agricultural Machinery, Electrical Machinery, Metal Products, Wood Working
4.	West Aswan - between Airport and Kurkur	70-100	Cement, Bricks, Concrete Products, Ceramics and Porcelain

Notes: 1/ Renovation 2/ Excluding large-scale factories

Source: The JICA Study Team.

(2) Processing of Non-metallic Minerals for Building Materials

The Project Area is rich with various non-metallic minerals, and offers possibilities of developing building material industries. Stable supply of inexpensive building materials is essential for the implementation of the integrated development plan. Major markets for building materials will include housing, office and factory buildings, roads and bridges, ports and airports, construction in the agricultural sector, among which housing will be the most important sector in terms of building materials consumption.

New housing construction in the Project Area is estimated to be about 60,000 units in urban areas and 24,000 units in rural areas by the year 2000. In addition, at least 10,000 units of outdated houses will have to be rebuilt by the end of this century. Materials to be used for rural houses will, however, largely consist of such locally available materials as mud, sand, stones, date-palm leaves and so forth. Some processed building materials including cement and mortar will also be utilized for local housing development if they become available at reasonable prices.

Urban housing, particularly those in Aswan, will have to be entirely dependent on processed building materials, which will include concrete, clay bricks and others. These traditional processed building materials can be substituted by other building materials which are indicated in Figure 4-3-2.

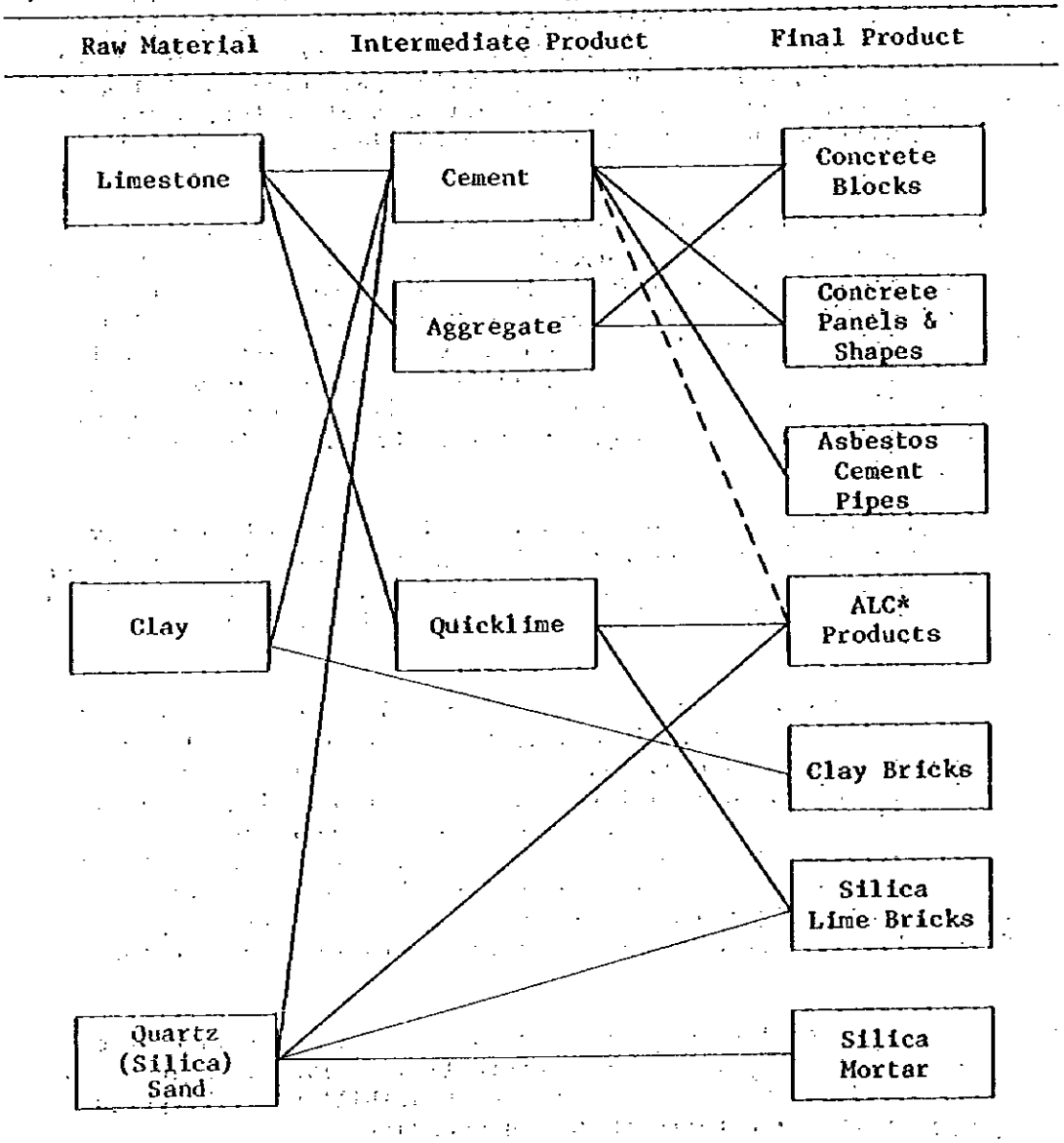
Among many building materials made from non-metallic minerals, cement is by far most important since it can nucleate many other building materials industries. Construction of a cement factory in Aswan is important in view of large demand increases expected during the implementation of this integrated development plan for the Project Area. The proposed Aswan cement factory is, therefore, designed to meet the local demand and also the demand generated in the area south of Qena, thus reducing transportation costs of cement which are currently supplied from further north and guaranteeing a stable supply to the Project Area.

The following is an outline of the proposed cement factory identified on the basis of the Study Team's pre-feasibility analysis. A detailed study is recommended however to confirm the feasibility of the project and to modify essential details if deemed necessary.

(i) Raw Materials:
- Limestone from the east of the Kurkur oasis

Average chemical composition	
L.O.I.	42.6%
SiO_2	1.7
Al_2O_3	0.6
Fe_2O_3	0.5
CaO	53.1
MgO	0.6

Figure 4-3-2 Utilization of Non-metallic Minerals for Building Material Production



Note: Abbreviation for autoclaved lightweight concrete products, which are mainly used for prefabricated buildings.

Source: The JICA Study Team.

Na_2O	0.08%
K_2O	0.18
SO_3	0.06
Cl	0.012

- Clay from the Kurkur - Kalabsha area
- Siliceous materials and iron ores from the Aswan area
- Gypsum from the Marsa Alam - Berenice area

(ii) Location: West of Aswan Airport near the brick factory

(iii) Utilities:
- Water piped from High Dam Lake or from underground wells
- Electricity from the hydroelectric power stations at the Dams
- Bunker C fuel oil transported from the Cairo area

(iv) Demand forecasts:

(Unit: 1,000 tons/year)

	1980	1985	1990	1995	2000
Aswan Governorate	61	116	177	230	266
Qena Governorate	168	250	336	405	459
Others	46	72	146	195	283
Total	275	438	659	830	1,008

(v) Estimated production capacity in the first stage of development:
Clinker production 330,000 tons/year
Cement production 343,200 tons/year
(Operation rate: 330 days/year)

(vi) Recommended production process: Of the two possible dry processes, i.e., one with Suspention Preheater (Dry - SP process) and the other with New Suspention Preheater (Dry - NSP process), the first Dry - SP process is recommendable.

(vii) Product: Ordinary Portland cement (ASTM Type 1 or equivalent)

(viii) Expected employment: 400 persons

(ix) Financial analysis (a plant with a daily output of 1,000 tons):
- Capital Investment

	£E million (1979)
Mining Equipment	2.633
Machinery	23.002
Construction	19.893
Interest during Construction	3.698
Working Capital	0.531
Total	49.757

- Production Costs

	£E (1979)/ton of cement
Direct	4.399
Minerals	1.542
Fuel	0.615
Refractories	0.404
Grinding Balls	0.296
Lubricant	0.012
Electricity	0.684
Repairing	0.846
Fixed	15.714
Labor	0.524
Depreciation	7.320
Interest	7.249
Plant Fixed Expenditure	0.177
Administration	0.444
Others	2.070
Paper Bags	2.070
Grand Total	22.184

- Some premises of production cost calculation:
  - Average wage: 37.5 £E/man-month
  - Interest: 5% p.a. (100% loan for 25 years with 7 year grace period)
  - Depreciation: Salvage value--10%
    Buildings--4% p.a.
    Plant excluding mining machinery--5% p.a.
    Others--20% p.a.
  - No company tax

(x) Discounted cash flow analysis:

Final Operation Rate (%)	Cement Sales Price (£E/t)	IRR (%)	Pay-out (Year)
90	25	8.2	9.7
90	35	15.2	6.3
90	46	21.9	4.6
100	25	9.4	9.0
100	35	16.5	5.9
100	46	23.4	4.4

4.4 TOURISM

4.4.1 Introduction

Taking into account the resource potentials and the features of demand and supply factors of tourism in the Project Area and the country as a whole, which are discussed in Chapter II, the present section attempts to provide the tourism development plan of the High Dam Lake Area up to the year 1997.

The purposes of the tourism development planning in the Project Area are: (i) to formulate development strategies and to select appropriate policy measures of the tourism sector which will meet the national goals and regional objectives; and (ii) to identify projects needed for the period up to the year 1997 and to provide the implementation schedule of those projects. These subjects are discussed in turn in the subsequent sections as well as the discussions on possible impacts to the Area through the implementation of those projects and on institutional aspects.

For the planning of tourism development in the Project Area, it is necessary to take into account the following two studies which have been undertaken prior to the present study; namely, National Plan for Tourism by German Agency for Technical Cooperation published in April 1978 (hereafter referred as "GTZ Study") and Lake Nubia Tourism Development Plan by SWECO, Ayoub & Omar Salim published in January 1979 (hereafter referred as "SWECO Study"). The former is a master plan of the tourism sector covering the entire country up to the year 1990, while the latter a regional plan up to the year 1990 for the Lake Nubia - High Dam Lake area extending over the Sudano-Egyptian border.

The SWECO Study covered the same area on the Egyptian side as the present study, but its orientation is significantly different. To follow the wording of its report, the SWECO Study was initiated "within the framework of the Coordination and Integration Agreement between the Governments of the Arab Republic of Egypt and the Democratic Republic of the Sudan," and aimed to identify steps for (i) greater integration of tourism in the Egyptian part with that in the Sudanese part of the region, (ii) increase of the total length of stay of tourists already coming to Egypt by extending the trip into the Sudan, and (iii) increase of the total duration of stay of the tourists already coming to the Sudan by extending their trip into Egypt. As a consequence, the study emphasizes, among other things, the earliest possible introduction of lake cruisers, or floating hotels, which ply the entire expanse of the lake.

The Study Team agrees with the SWECO Study concerning the importance of lake cruisers for closer integration of tourism activities between the two countries, but differs in the timing of their introduction. The major reason is the absence of attractions on the lakeshore along the cruizing route of over 300 km. In contrast to the endearing landscape of rural Egypt along the Nile downstream of Aswan, as the

GTZ Study points out, "the scenic attraction of the Nile Valley between Aswan and Wadi Halfa has been submerged in the waters of the gigantic dam, and the present banks of the artifitial lake are bleak and devoid of charm." The Study Team is more conservative in the matter of lake cruisers, and believes that their introduction would be more suitable after the development on the lakeshore progresses, especially the settlement of foreshore communities. The timing of introduction would therefore come much later than 1981 which the SWECO Study suggests. Other than the question of lake cruisers, the Study Team is at no variance with the SWECO and GTZ Studies in the evaluation of respective tourism resources and the general orientation to develop Aswan and the lake as integral part of the Nile Valley tourism.

4.4.2 Tourism Development Strategy

There are three sub-areas for the development of tourism in the Project Area; namely (1) Aswan City and its vicinity, (2) Abu Simbel, and (3) the Lake Area. Although these three sub-areas are separated from each other geographically, their basic characters as tourist destinations are based on the historical and cultural assets and complement each other. For this reason the development of whole sub-areas must be guided under common strategies.

Taking into consideration the regional development objectives, which are discussed in Chapter III, resource potentials in the Project Area and the trends of demand and supply factors of tourism in the country and the Project Area, the Study Team has identified the following strategies as relevant to the tourism development in the Project Area.

(i) Fastest possible growth, on condition that it be coordinated with the development plans in other tourist areas in the country;

(ii) Increase in foreign currency earnings;

(iii) Better presentation of tourism resources;

(iv) Efficient utilization of tourist facilities

(v) Integrated development of the tourism sector with other sectoral development in the Project Area, particularly those of agriculture, fishery, transportation, urban and community development; and

(vi) Preferencial development of evident market prospects rather than an entirely new type of tourism.

Among the above-mentioned strategies, the strategies from (i) through (v) are self-evident. The strategy (vi) is adopted due to the following reasoning. For the future development of tourism in the Project Area, it must be kept in mind that no tourism resource has equal attraction to various groups of tourists such as Europeans, Arabs, and Egyptian nationals. Furthermore, all potential resources cannot be developed at once, given financial and other constraints. Therefore, priorities must be primarily evaluated in terms of the preferences shown in past tourist behaviors, or of evident market prospects. Investment in new types of tourism like development of various recreational and resort

facilities will have to be considered if it is reasonably expected to open up already latent facets in the tourist market. The integrated development with Sudanese tourism, which is the theme of the SWECO Report on Lake Nubia Tourism Development, is considered in line with this thinking.

4.4.3 Policy Measures for Tourism Development

Bearing the above-mentioned strategies in mind, the policy measures to be adopted for the development of tourism in the Project Area were selected. Table 4-4-1 indicates the present features of tourism in the three sub-areas and the associated policy measures for launching a tourism development program. Some measures raised in the table may be rejected because of contradiction with other measures.

The following observations and future perspectives for tourism development in the Project Area can be made from Table 4-4-1:

(i) From the composition of tourism resources in the Project Area and the trends of national and regional demands, the main historical tourism of the European and American market is still very promising in the future. The touring route of this clientele is the traditional Cairo - Luxor - Aswan - Abu Simbel axis and their length of stay will be not more than 2 - 3 days in the Project Area unless their total length of stay in Egypt will be prolonged or additional attractions could be provided in the Project Area. However, their major attractions are historical assets and most of the major historical assets in the Project Area have already been exploited except the resource potentials of Abu Simbel and the temples along the lakeshore.

(ii) The policy to attract Arab tourists is not suitable for the Project Area, because they are urban-oriented and, comparing with Cairo and Alexandria, the present urbanization of Aswan will not be able to satisfy their tastes. Their major tourist season is summer, which is not the tourist season for Aswan City and the High Dam Lake Area.

(iii) To attract the winter-resort-oriented clientele must be taken as a long term objective. It must be considered in accordance with the future renovation of the disordered part of Aswan City and the development of new attractiveness to the City.

(iv) The over-capacity of lower class hotels in Aswan suggests that domestic tourism such as school-organized study tours for the High Dam and the Great Temples in Abu Simbel must be exploited. If it is possible to bring this clientele in the off-season, it will be of great help to the management of lower-class hotels.

From these considerations, the following development policy for the three sub-areas can be identified.

Table 4-4-1 Main Features and Associated Policy Measures

A: Aswan
S: Abu Simbel
L: Lake Area

Aspects	Main Features	Possible Measures to be Taken
1. Tourism Resource	- Mild climate in winter (A, S, L) - Outstanding quality assets for historical tourism (S) - Historical assets of moderate quality compared with those in Cairo and Luxor (A) - Barren and monotonous environment (S, L) - Presentation of cultural resources (e.g., Nubian folklore) in need of improvement (A) - Need of supplementary attractiveness (S) - Some contemporary assets educationally important (A) - (For other features refer to Chapter II, Section 2.4)	- Provision of supplementary attractions such as attractive night-life (A), pleasant wining and dining (A, S), genuine folklore events (A,S), sport facilities (A), recreation facilities (A, S), sound & light show (S), etc. - Overall renovation of city center (A)
2. Tourism Season	- Peak in winter (A, S) - Seasonality is evident particularly in lower-class hotels, but higher class hotels attract tourists even in the summer (A) - Nine-month tourism season possible (A, S)	- Measures to attract off-season tourists (A, S) - To operate hotels for nine-month period (S, lower-class hotels in A)

Aspects	Main Features	Possible Measures to be Taken
3. Origin of Tourists	- Mostly Europeans & Americans (A, S) - Some domestic tourists of students and families (A, S) - Some winter-resort-oriented visitors (A) - Very few Arab tourists (A, S)	- General publicity abroad (A, S) - Special policy measures for promoting school-organized educational tour (A, S)
4. Trend of Tourist Arrivals	- Increase of historical tourists from Europe and America very promising (A, S) - Prospect of increase in domestic tourism as a consequence of rising income (A, S)	- General publicity provided for tour operators abroad and in Cairo - Easing of formalities (e.g., entry permits to airport and the High Dam Area)
5. Mode and Route of Arrivals	- Mostly from Cairo and Luxor by air (A) - Increasing importance of Nile cruisers from Luxor (A) - Domestic tourists from Cairo and Luxor by train (A) - Bus tour between Luxor and Aswan not yet developed (A) - Guided tours through Abu Simbel too short due to flight schedule (S)	- Need of tourism development for Esna, Edfu and Kom Ombo and promotion of a bus tour to visit these destinations - Provision of improved and expanded landing facilities for Nile cruisers

(continued on the next page)

Table 4-4-1 (continued)

Aspects	Main Features	Possible Measures to be Taken
6. Length of Stay	- Average two days at Aswan including a day-trip to Abu Simbel	- General publicity for home and abroad - To make Abu Simbel an overnight-stay destination (S) - Need of diversifying attractions (A, S) - Opening of new resort areas (A, L)
7. Accommodation	- Higher-class hotels did not keep pace with tourist arrivals (A, S) - Prospect of over-supply for low class hotels (A) - Need of renovation and improvement (A, S) - Overall shortage of capacity (A, S)	- Construction of new hotels in accordance with the prospect of tourist increase (A, S) - Renovation of old hotels (A, S) - Promotion of demand for lower-class hotels (e.g., domestic tourists such as students and school-children) (A)
8. Amenities	- Lack of entertainments (e.g. sports, games, night-life, etc.) (A, S) - Shopping areas (souk) in need of renovation (A) - Total lack of opportunities eating outside the hotel (A, S) - Lack of shopping and other expending opportunities (A, S) - Good food at the highest-class hotels (A) - No coffee shops at the tourist site (A, S)	- Provision of sport and game facilities, fishing equipment, and other good amenities for new hotels and renovated hotels (A, S) - Attempts to attract private investors for the provision of good amenities (A)

Aspects	Main Features	Possible Measures to be Taken
9. Infrastructure	- Airport terminal building inadequate (A, S) - Landing facilities for Nile cruisers in need of expansion and improvement (A) - Inaccessible for historical remains (L) - Increase of capacity required for air connection between Aswan and Abu Simbel - Inadequacy of the general infrastructure (A) - Non-existent for general infrastructure (S)	- To establish general policies for provision of general infrastructure (A, S) - To improve the telecommunication system between major tourism areas (A, S) - To increase the number of flights and their capacity by the additional leased aircrafts - Need of ecological and environmental considerations for the future development (A) - To renovate city center (A)
10. Employment	- Shortage of skilled manpower in hotel sector (A, S)	- Vocational training on the job and in special schools (A)
11. Tourist Information	- Location of Present Tourist Information Center outside the major tourists' flow (A) - Lack of written information (A, S) - Shortage of foreign language speaking guides (A, S) - Little activity of private travel agencies (A)	- Establishment of a Tourist Visitor Center at an appropriate location (A, S) - Provision of information & orientation boards in the City and tourist area (A, S) - Provision of pamphlets and brochures (A, S)

(continued on next page)

Table 4-4-1 (continued)

Aspects	Main Features	Possible Measures to be Taken
12. Others	- Scarcity of tourism statistics	- Establishment of a tourism data collecting system
	- Lack of information on: (1) tourist expenditure (2) domestic tourism etc.	- To carry out studies on necessary subjects
	- Dangerous situation of the epidemic of schistosome in the High Dam Lake Area	- To take necessary measures to prevent the epidemic of schistosome

Source: The JICA Study Team.

(1) Aswan

Before the World War II, Aswan was known as a typical winter resort for European high society. Since the introduction of cheaper airfares and mass tourism, there has been a worldwide tendency for tourists to stay at their destinations for shorter periods. Aswan's case correlates with this tendency and its length of stay has been shortened. In addition to this, Aswan could not satisfy the new vacation behavioral pattern of this social stratum, who moved to other winter resort such as Seychelles, the Caribbean, the French Mediterrenian coast, etc. The fundamental decision must be taken for the tourism development of Aswan, whether (i) trying to regain this highest-class and winter-resort-oriented stratum, or (ii) trying to increase the size of the present market, or (iii) trying to find the new market.

Concerning the first alternative, Aswan will not be able, at least in a short term, to regain the favor of this stratum of tourists. Long term efforts at renovating the disordered city center and at developing new attractiveness will be necessary in this respect. Therefore, the policies must be sought from the alternatives (ii) or (iii), or the combination of them. The Study Team has adopted the following development policies as appropriate for Aswan.

(i) To put particular emphasis on the existing and promising market of historical tourists from Europe and America;

(ii) To exploit the study tour market, which is now only a small segment of the total Egyptian market for tourism;

(iii) To improve the presentation of tourist resources in Aswan and its vicinity and the quality of tourist facilities; and

(iv) To provide better infrastructure to improve Aswan City's general atmosphere which should become a source of attraction.

Particular reference must be made to Policy (ii) above. The idea is that students and school-children study about the construction of the High Dam, which is one of the great achievements of the Egyptian people. When they visit the site after studying its history and mechanism of generating electricity as well as its impacts to the national economy, it will certainly enhance their self-confidence which is particularly important for the future development of the country. Special arrangements will be required for the promotion of school-organized study tours such as provision of special discount fare for railway or charge for accommodation, subsidies to the schools in remote areas, etc., as well as the encouragement of this type of tour by, possibly, the Ministry of Education. The school-organized study tour is common in Japan and every primary school and lower-secondary school conduct their study tours in the children's final year at the respective schools. The market of this type is of substantial size,

(2) Abu Simbel

At present the Great Temples of Ramses II and Nefertari are the only attractions in the area. However, the attractiveness of the Temples are so outstanding that about 100,000 tourists visited the area in 1978, each paying about less than £E 30 for airfare and entrance fee to the Temple Area for a half a day trip from Aswan. If this outstanding attractiveness of the Temples is supported by some additional attractions as well as adequate accommodation, the area has an enormous potential to become a new tourist center in Egypt in addition to the traditional centers of Cairo, Luxor, Aswan and Alexandria. Abu Simbel Tourism Development Plan should, therefore, aim to let the visiting tourists stay in the area for a longer period of time and ultimately overnight; namely, (i) to establish Abu Simbel as an overnight stay tourist destination adding supplementary attractiveness to the area, which must be a quality mixture of Nubian culture and the Great Temples, as well as the provision of accommodation; and (ii) to provide better infrastructure.

(3) The Lake Area

Both sides of the shores of High Dam Lake are not presently inhabited except by 7,000 fishermen. Visitors to the area today will meet a magnificient man-made lake, but the environment around it is rough, deserted with only a few species of wildlife found in the area other than some poisonous snakes and insects.

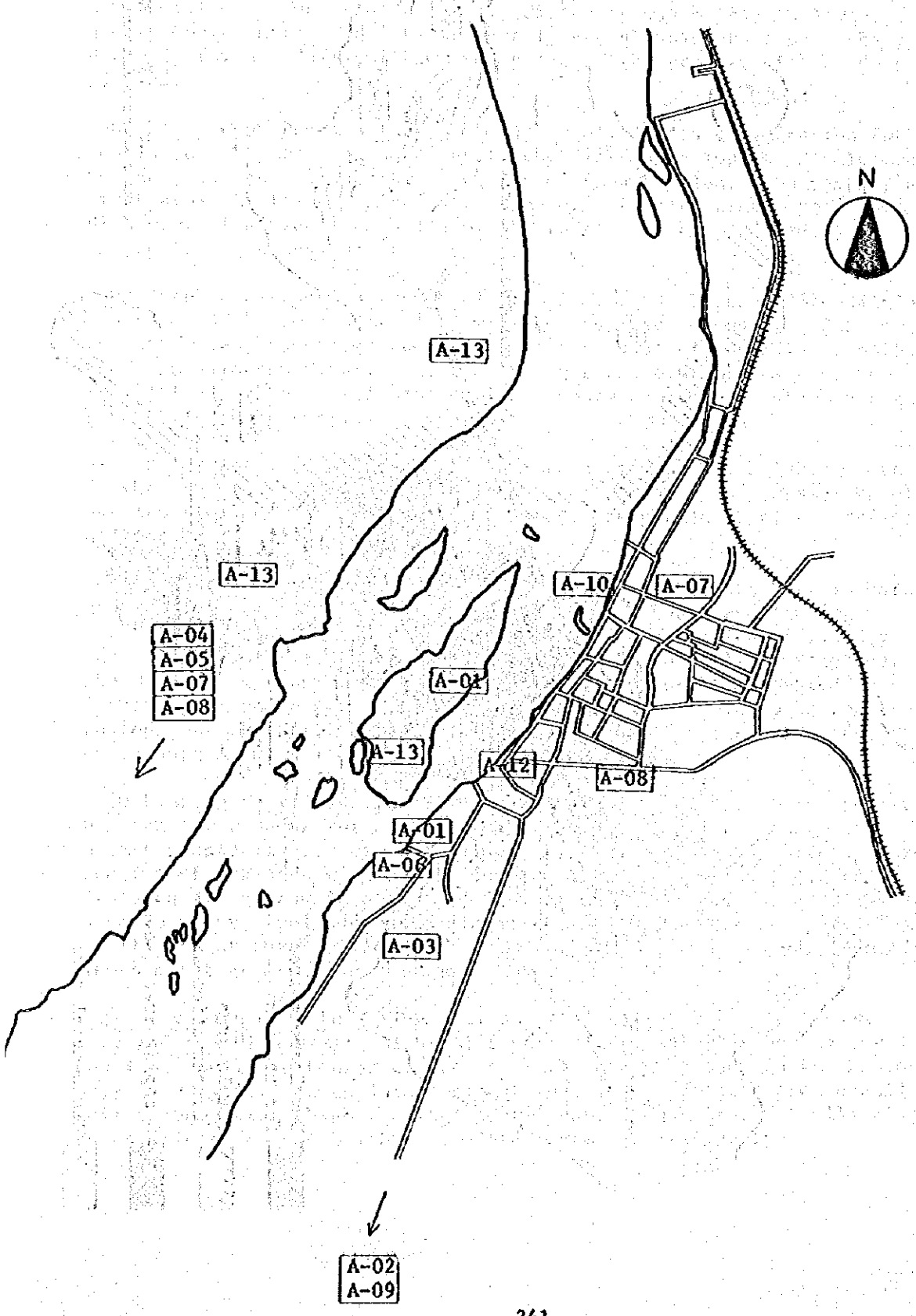
In the longer term, plans could be made for a floating hotel connection between Aswan and Abu Simbel, even further to the Sudan. This will open up tourism potentials of El Sibu and Amada, and require the construction of jetties and other tourist facilities such as coffee shops and souvenir shops. The reason why this will be a long-term project is that the revenue from those shops will be small and only supplementary to lakeshore agriculture and fishery. Therefore the project should be implemented after the establishment of agro-fishery communities along the lakeshore.

4.4.4 Tourism Development Projects and their Implementation Schedule

Based on the development policies stated above, the projects are formulated as follows. The projects for the promotion of tourism up to the year 1987 are mainly designed for the increase of room capacity for higher-class hotels to meet the rising demand for historical tourism and upgrading of the Project Area so as to create better tourism attractiveness. The recommended implementation schedule of these projects are listed in Table 4-4-2.

The recommended plan is only the first step in the process of selecting the most advantageous path for tourism development in the Project Area up to the turn of the next century. The strategies and policies outlined in the previous sections must be modified in response to changing circumstances at national and regional levels. It will thus be necessary for monitoring and review to continue in accordance with changing circumstances.

Figure 4-4-1 Tourism Projects in Aswan



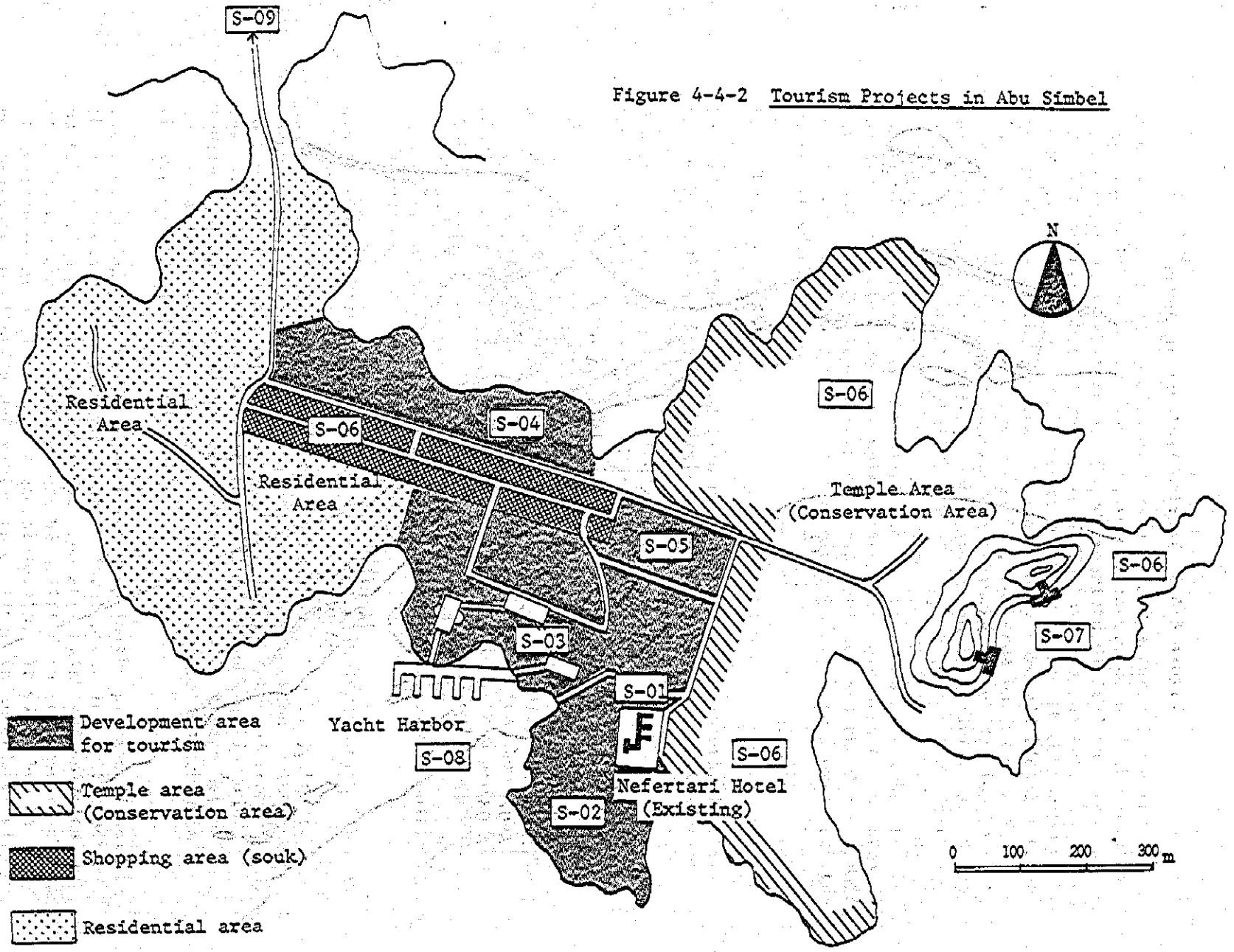


Figure 4-4-2 Tourism Projects in Abu Simbel

(1) Recommended Projects up to the Year 1987

A-01 Hotel Extensions (Aswan City): Presently two hotels in Aswan, namely Oberoi Hotel and Cataract Hotel, are planning to expand their capacity for an additional 100 rooms each. The project will be completed by 1982.

A-02 Hotel Construction (Near the High Dam): A new organization for tourism development in Upper Egypt, the Misr Aswan Tourism Development Company, was established by an equity of £E 6 million. The company's first project will be the construction of a tourist center near the High Dam. Additional capacity of 150 rooms will be supplied by the completion of this project.

A-03 Hotel Construction (Aswan City): From 1983 through 1987 additional 150 rooms of 3- to 5-star hotel will be required to meet the demand. The hotel can be constructed at the eastern side of the Nile, possibly near the Kalabsha Hotel. The project is recommended to have sport facilities such as a swimming pool, a tennis court, etc. which are at present in short supply.

A-06 Hotel Renovation and Upgrading (Aswan City): The Kalabsha Hotel on the eastern side of the Nile is presently ranked as a 3-star hotel, but its facilities for guest rooms as well as public space are deficient and in need of renovation.

A-09 New Jetty for Tourism (the High Dam): The existing Western Harbor at the High Dam is presently shared by fishery boats and touring ferries to Kalabsha Island. For the effective operation of fishery and tourism activities, the separation of function will be required. The Study Team recommends that the existing harbor be renovated as a fishery port and a new jetty for tourist boats and ferries be constructed near the High Dam, possibly at the site of the tourist center of Project A-02.

A-10 Landing Facilities for Nile Cruisers (Aswan City): Nile cruisers between Aswan and Luxor are favored by foreign tourists and their market prospects are very promising. To meet the demand, further introduction of cruisers will be necessary. At the same time ports for cruisers are narrow in space and in need of facilities for handling potable water, fuel and waste disposal. It is planned that port facilities at Luxor will soon be improved by IBRD assistance. A similar improvement at Aswan is recommendable.

A-11 Provision of Information and Tourists' Bulletin Boards (Aswan City and the High Dam): At present very little information and few tourists' bulletin boards written in English can be seen in the Project Area as a whole. As an international resort, the Project Area should have those boards which are legible to western tourists. It will also be beneficial to establish a standard route for sightseeing.

A-12 New Visitor Center (Aswan City): At present, good orientation guides and tourist information services are lacking in the Project Area. One of the reasons is that the existing tourist information center in Aswan is located a little too far from the major flow of tourists in the City. The Study Team recommends that a multi-story visitor center be established at an appropriate site along the corniche, possibly on or around the present Egyptair Office. The visitor center should house a tourist information office; travel agencies; reservation offices for Egyptair, National Railway and Nile cruisers; an exhibition hall; and possibly some good international and local food restaurants on higher floors.

A-13 Rehabilitation of Deteriorating Tourism Resources (Aswan City): The state of preservation of some historical ruins is not sufficient. Adequate conservation measures and a climate and dust control system should be established and implemented.

S-01 Hotel Extension (Abu Simbel): The project is to renovate and expand the existing 20-room Nefertari Hotel. An additional 44 bedrooms will be provided and the existing dining room expanded. After the implementation of the project, which is scheduled to complete in 1982, the hotel can be used during the summer by the provision of air-conditioning facilities. The project will be financed by IBRD.

S-02 Hotel Construction (Abu Simbel): For the purpose of making Abu Simbel as an overnight-stay tourist destination, it will be required to construct a hotel of 200 rooms adjacent to the present Nefertari Hotel. The new hotel is recommended to have air-conditioning facilities to ensure year round operation, sport facilities and a restaurant and café to be used even by the day-return visitors to the Temples.

S-05 Nubian Folklore Village (Abu Simbel): The establishment of a Nubian Folklore Village will add a substantial attraction to the Great Temples and be beneficial in making Abu Simbel an overnight-stay destination. The Village will comprise a Nubian folklore museum, a Nubian theater for dance and music, a Nubian handicraft center, etc.

S-06 Tree Planting (Abu Simbel): Trees are now being planted at the Temple area but limited to the front of the Great Temples. They must be extended to cover the whole Temple area and the streets of Abu Simbel.

S-07 Sound and Light Show (Abu Simbel): By the completion of Project S-01, the introduction of a Sound and Light Show at the Great Temples will be required for the guests of Nefertari Hotel.

S-08 Yacht Harbor (Abu Simbel): The construction of a Yacht Harbor will add an "active" element to the tourism in Abu Simbel. For the tourists who want to stay longer periods in Abu Simbel, activities such as yachting and fishing in the lake as well as other sport facilities at the hotel are needed.

Table 4-4-2 Investment Schedule for Tourism Sector

▯▯▯▯▯ Preparation (Feasibility study, detail design, etc.)

▒▒▒ Construction

	Project	Project Cost (£E mil.)	82	87	92	97
1. Aswan						
A-01	Hotel Extentions (3-5 star; 200 Rooms)	4.0	▯▒			
A-02	Hotel Construction (3-5 star; 150 Rooms)	6.0	▯▒			
A-03	Hotel Construction (3-5 star; 150 Rooms)	6.0	▯▯▒			
A-04	Hotel Construction (3-5 star; 300 Rooms)	12.0	▯▯▒			
A-05	Hotel Construction (3-5 star; 300 Rooms)	12.0			▯▯▒	
A-06	Hotel Renovation and Upgrading (3-5 star; 120 Rooms)	3.0	▯▯▒			
A-07	Hotels Construction (1-2 star; 142 Rooms)	3.0			▯▯▒	
A-08	Hotels Construction (1-2 star; 410 Rooms)	8.7			▯▯▒	
A-09	New Jetty for Tourism at the High Dam	0.2	▯▒			
A-10	Landing Facilities for Nile Cruisers	0.5	▯▯▒			
A-11	Provision of Information and Tourists' Bulletin Boards	0.2	▯▒			
A-12	New Visitor Center	1.5	▯▯▯▒			
A-13	Rehabilitation of Deteriorating Tourism Resources	1.0	▯▯▒			
Investment Cost for Aswan Tourism		58.1	9.2	13.2	15.0	20.7

(continued on the next page)

Table 4-4-2 (Continued)

Project	Project Cost (£E mil.)	82	87	92	97
2. Abu Simbel					
S-01 Hotel Extension (3-5 star; 44 Rooms)	0.8				
S-02 Hotel Construction (3-5 star; 200 Rooms)	8.0				
S-03 Hotel Construction (3-5 star; 300 Rooms)	12.0				
S-04 Hotel Construction (3-5 star; 300 Rooms)	12.0				
S-05 Nubian Folklore Village	3.0				
S-06 Tree Planting	0.1				
S-07 Sound and Light Show	0.2				
S-08 Yachet Harbor	0.3				
S-09 Botanical Garden	2.0				
Investment Cost for Abu Simbel Tourism	38.4	1.1	11.3	14.0	12.0
3. Lake Area					
L-01 Floating Hotels (2 Cruisers)	8.0				
L-02 Night Navigation Facilities	0.1				
L-03 El Sibu/Amada Tourism Development	1.0				
Investment Cost for Lake Area Tourism	9.1	-	-	9.1	-
Total Investment Cost for the Project Area	105.6	10.3	24.5	38.1	32.7

Source: The JICA Study Team.

(2) Recommended Projects for the Period from 1988 through 1997

Other longer-term projects to be implemented for the period from 1988 through 1997 are also listed in Table 4-4-2. During this period the tourism development along the lakeshore is recommended to commence and the introduction of floating hotels to the lake is also scheduled.

4.4.5 Impacts of Tourism Development

The contribution that tourism makes to the national economy is not limited to its foreign exchange earning capacity. Increased tourist expenditures generate demands for local goods and services, thereby create employment and income in other sectors and also increase the tax revenues of the government. As long as proper balance is kept in the investment allocations to various sectors, increased spending on the tourism sector can help boost the local economic activities. Careful tourism investment planning should be one of the important components of the integrated regional development framework.

(1) Employment Effects

Tourism provides new opportunities for employment in the Project Area. Employment is generated in the tourist sector itself and additional employment follows in the Tourism-supporting sectors such as the construction industry, agriculture, etc. The pace of increase in employment depends not only on the rate of growth of visitor expenditure but also on labor intensity and labor productivity in the tourism sector. However, statistics and surveys to estimate the effect of employment by tourism development are not available in the Project Area. A crude estimation of the number of employees and management staff engaging in tourism activities in Aswan is presented in Table 4-4-3, based on hearings from the experts of tourism in Egypt and staff of each tourism unit in Aswan and on the data in similar tourist areas.

Based on the estimates in Table 4-4-3 and the projected buildup of hotels in the Project Area (c.f. Table 2-4-9), the number of future employment in the tourism sector is estimated for the Project Area in Table 4-4-4.

(2) Income Effect

The reliable information on the income for the employees of the tourism sector in the Project Area is not available. In the National Plan for Tourism, the average per-capita annual income of the staffs and employees of international hotels in 1978 is estimated as £E 1,080/year. Based on this figure and a number of assumptions, total annual income generated by the sector in the Project Area is calculated (Table 4-4-5).

Table 4-4-3 Crude Estimation of Employment Generated by Tourism Sector in Aswan

(Unit: persons)

Enterprises	Number of Employed
3- to 5-star Hotels	990
1- to 2-star Hotels[1/]	110
Sub-total (Hotel Sector)	1,100
Restaurants and Coffee Shops[2/]	70
Horse-drawn Carriages	200
Taxis	150
Transportation[3/]	50
Travel Agencies	30
Souvenir Shops	200
Handicraft Makers and Sellers	300
Sailing Boats (Fallukas)	200
Others[4/]	70
Sub-total (Associated Sectors)	1,270
Total	2,370

Notes: 1/ Average per day for year-round operation basis.

2/ About 10% of total employees are assumed to be serving only tourists.

3/ Include staffs of airport, Egyptair and Railway engaging for tourists.

4/ Includes staffs of Ministry of Tourism, Tourist Police, etc.

Source: The JICA Study Team.

Table 4-4-4 Projected Employment in the Tourism Sector

(Unit: persons)

Sector	1979	1982	1987	1992	1997
Hotel Sector	1,130	1,960	2,940	4,040	5,410
Associated Sectors	1,300	2,260	3,400	4,670	6,250
Total	2,430	4,220	6,340	8,710	11,660

Source: The JICA Study Team.

Table 4-4-5 Projected Income Generated by Tourism Sector

(Unit: £E million)

Sector	1979	1982	1987	1992	1997
Hotel Sector	1.2	2.0	3.1	4.3	5.7
Associated Sectors	1.0	1.8	2.7	3.7	4.9
Total	2.2	3.8	5.8	8.0	10.6

Assumptions:
1) The annual income of employees in the international hotels in the Project Area is 5% less than that of the national average.
2) The income of employees in the lower-class hotels and those in the associated sector are 30% less than that of the employees in international class hotels in the Project Area.
3) The increase rate of income of employees in the international hotels between 1978 and 1979 is assumed to be 10%.

Source: The JICA Study Team.

4.4.6 Institutional Aspects

The tourism sector in Egypt has long been dominated by public sector activities, through direct participation in the tourist catering businesses and joint ventures with foreign and domestic private investors as well as through infrastructural investment for tourism. Although the regulation and control of the various components of the tourist industry by the public sector are not only impossible but undesirable, the public sector participation is often effective and necessary to influence the pattern of tourism development and also to increase the confidence of private investors.

At present there are three public organizations for the supervision and planning of the tourism sector in the Project Area except the management of hotels and other tourist industries in the public and private sectors. They are:

(i) Ministry of Tourism, Aswan Office; the major work is the provision of tourist information to visitors,

(ii) Regional Planning of Aswan, Tourism Section; for the basic studies on the tourists and the tourism sector in Aswan Governorate, and

(iii) Egyptian Antiquities Organization, Aswan Office; for the provision of historical assets and their preservation to tourists.

At the same time, the High Dam Lake Development Authority is responsible for the planning and implementation of development projects in the Project Area, but it does not have a tourism department.

However, it is not clear which organization is responsible for the supervision and implementation of feasibility studies and the detailed design for the tourism projects in the Project Area. Since a number of projects will be implemented in the future, it is necessary to set up a department or a unit in one of the existing organizations whose major responsibility will be:

(i) Preparations of a tourism development policy in close coordination with the overall regional development strategy and other sectoral development policies,

(ii) Preparation of feasibility studies and detailed designs for each tourism development project,

(iii) Supervision of the implementation of those projects and follow-up thereafter, and

(iv) Coordination with other organizations related to tourism and other regional organizations.

For this purpose the Study Team suggests that the new department or unit must be set up in the High Dam Lake Development Authority for the consistent implementation of tourism development policy and for the better coordination with other organizations related to tourism and regional development.

4.5 TRANSPORTATION

In this section, transportation development projects will be identified, including their approximate implementation schedules and costs. First, rough estimation of future passenger and goods transportation demands in the Project Area will be presented on the basis of the expected sectoral outputs (agriculture, fishery, mining and manufacturing and toursim) and of the potential areas of development identified in Section 3.3 of Chapter III.

4.5.1 Future Transportation Demand

(1) Fishery Products

It is assumed that the annual yield from High Dam Lake will increase at a constant annual rate from the current level of approximately 20,000 tons to approximately 80,000 tons by the end of this century and that the proportion of tiger fish in the total annual fish hauls will gradually rise during the period, while tilapia will account for about 60% of the total landing. Future transportation demands in the fishery sector are shown in Table 4-5-1. All fish catches in the lake will be landed at the West Harbor at Aswan and another harbor to be newly constructed at Abu Simbel.

Table 4-5-1 Transportation Demand in the Fishery Sector

(Unit: 1,000 tons)

	1978	1987	1992	1997
Tilapia	16	28	40	50
Tiger Fish and Others	5	11	18	30
Total	21	39	58	80

Source: The JICA Study Team.

(2) Agricultural Products

The total area of agricultural development and the yields of various crops are estimated in 4.1 of this chapter. Total surplus production after deducting local consumption is aggregated for each development area in Table 4-5-2. Most of this surplus, leaving a small portion which will be locally processed, will be collected to Aswan City where some are consumed and processed and the remainder will be shipped to the delta area in the north. The Project Area will produce no wheat and rice, and these staple food crops will be shipped from the delta area to Aswan City and then distributed to each development area in accordance with its estimated population, as shown in Table 4-5-3.

Table 4-5-2 Transportation Demand in the Agricultural Sector

(Unit: 1,000 tons)

Development Area	Local Consumption			Surplus over Local Consumption		
	1987	1992	1997	1987	1992	1997
Kurkur	0.3	0.4	0.4	125.9	133.2	140.6
Kalabsha	5.3	10.0	13.8	34.2	97.6	275.0
El Allaqi	0.2	1.7	4.2	-	3.8	66.0
Tomas/Affia	-	-	1.3	-	-	30.6
Tushka	0.6	2.6	3.5	6.2	84.0	154.8
Abu Simbel	1.1	4.7	6.2	35.0	33.5	34.1
Ballana	-	-	0.4	-	4.5	32.4
Total	7.5	19.4	29.8	201.3	356.6	733.5

Source: The JICA Study Team.

Table 4-5-3 Transportation Demand of Wheat Flour and Rice from Aswan City

(Unit: 1,000 tons)

Development Area	1987	1992	1997
Kurkur	0.4	0.4	0.5
Kalabsha	6.1	11.5	15.9
El Allaqi	0.2	2.0	4.9
Tomas/Affia	-	-	1.5
Tushka	0.7	3.0	4.1
Abu Simbel	1.3	5.5	7.2
Ballana	-	-	0.5
Total	8.7	22.4	34.6

Source: The JICA Study Team.

(3) Mineral Products

A substantial variety of mineral resources will be mined in the Project Area, but the bulk of the derived transportation demand will be made up by limestone (as raw material of cement), granite, marble, kaolin, and clay (as raw materials of cement and bricks). The annual outputs of these mineral products are estimated up to the end of this century in Table 4-5-4. All of them, except for some limestone and clay which will be partly used by cement and brick factories to be constructed in the outlying area of Aswan City, will be shipped from the quarries to the City.

Table 4-5-4 Transportation Demand for Mining Products

(Unit: 1,000 tons)

	1978	1987	1992	1997
Limestone	-	450	450	450
Granite	36	54	70	90
Marble	-	20	30	45
Kaolin	34	40	45	50
Clay	-	100	150	200

Source: The JICA Study Team.

In addition to those listed in Table 4-5-4, a substantial volume of transportation demands will be generated by rocks and gravels as construction materials for buildings and other civil works in the Project Area. Judging from the construction requirements expected in Aswan City, Kalabsha and Abu Simbel, approximately 500,000 - 600,000 tons will be needed at these places in peak years. However, these materials will be quarried mostly in the vicinity of these areas, and generate only short-distance local transportation demands.

(4) Consumer Goods

Clothing items, processed food, and durable consumer goods will have to be transported from Aswan City or from elsewhere via the City to development centers and village communities to be developed in the entire area to the south of Aswan City, because there will be practically no industries to manufacture such items in the Project Area excluding the City. The derived transportation demands are estimated to total 10,000 - 20,000 tons per annum at the end of this century when the total population in the area reaches 200,000 and therefore are not large enough to overburden the future transportation network.

(5) Goods Traffic Between Aswan and Wadi Halfa

Despite the rapid increases in recent years, the goods traffic between Aswan City and Wadi Halfa of the Sudan was only 12,000 tons in 1978. Assuming a high increase rate of 15% per annum, the traffic is estimated to reach 170,000 tons by the end of this century as shown in Table 4-5-5, and will be easily serviced by boat transportation available over the lake.

Table 4-5-5 Goods Traffic Between Aswan and Wadi Halfa

(Unit: 1,000 tons)

	1978	1987	1992	1997
Aswan - Wadi Halfa	10	35	70	140
Wadi Halfa - Aswan	2	7	14	28
Total	12	42	84	168

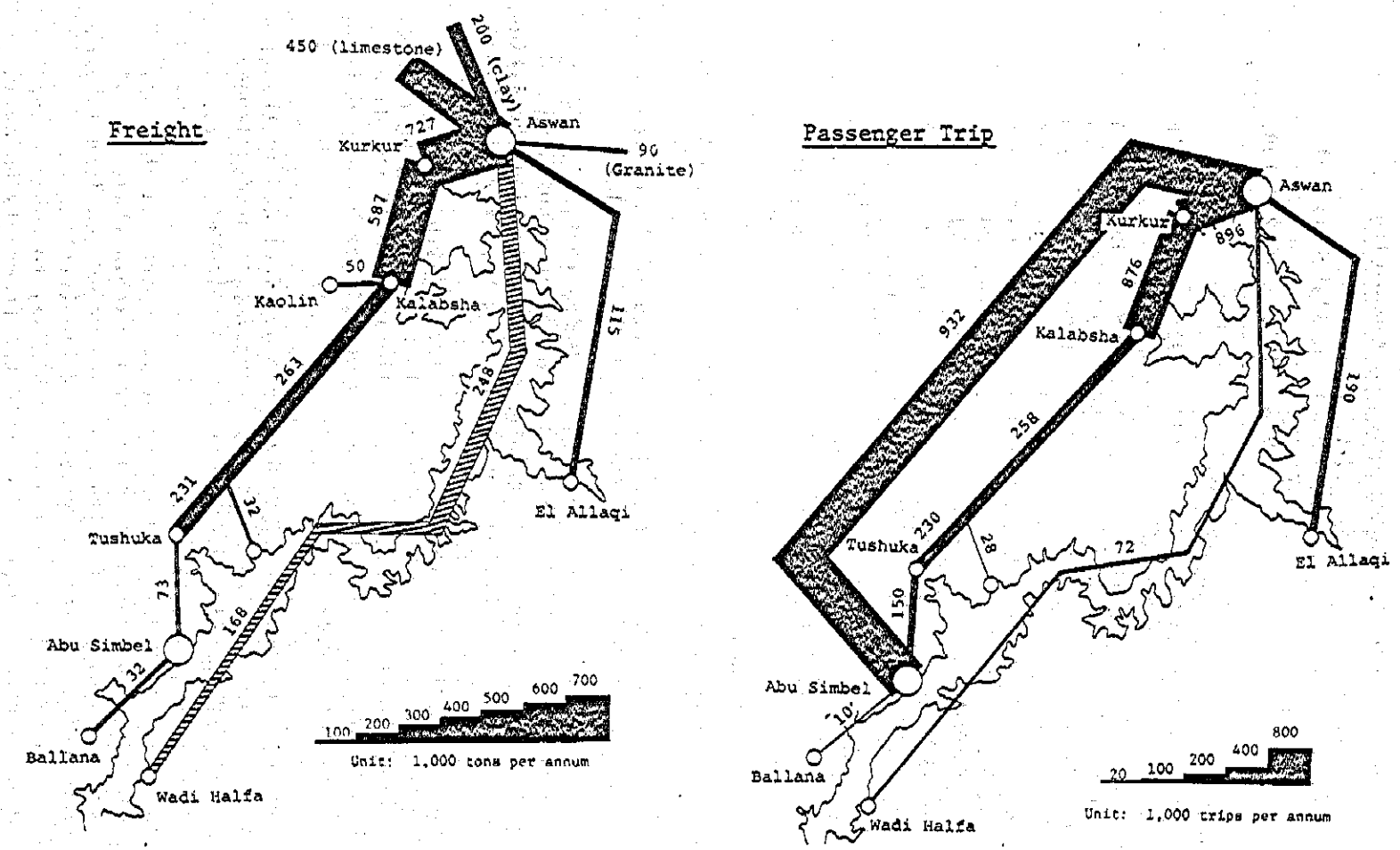
Source: The JICA Study Team.

(6) Passenger Movement

Tourist trips between Aswan City and Abu Simbel will make up a large portion of the future passenger movement in the Project Area (Table 4-5-6). As discussed in Section 4.4 of this chapter, tourists who visit Abu Simbel via Aswan are projected to reach 450,000 per year by the end of this century. Almost all foreign visitors will utilize air services and therefore, the number of visitors who will use buses, taxis, and floating hotels will remain very small. Considering the importance of Aswan City as the regional economic and cultural center, it is expected that the passenger movement between Aswan City and the towns and villages to the south of the City will become quite large in the future. Assuming that the average number of daily trips from the Kalabsha area and its vicinity to Aswan will be about 1.0 per 100 inhabitants and about 0.5 per 100 inhabitants from the southern part of the lakeshore around Abu Simbel to Aswan, the passenger traffic to the City will reach 500,000 visits a year by the end of the century. In 1978, approximately 6,000 visitors came to Egypt from the Sudan via Wadi Halfa. Assuming that the number of such visitors will increase at an average annual rate of 10% in the future, the passenger traffic will number 36,000 in 1997.

The probable future flow patterns of goods and passengers traffic in the Project Area are schematically shown in Figure 4-5-1.

Figure -5-1 Future Freight and Passenger Flow Patterns (1997)



Source: The JICA Study Team.

Table 4-5-6 Passenger Trips to Aswan City

(1,000 trips)

		1978	1987	1992	1997
(1)	Tourists Aswan to Abu Simbel	100	250	335	466
(2)	Others	n.a.	149	352	544
	Kurkur	-	7	8	10
	Kalabsha	-	120	225	310
	El Allaqi	-	4	37	95
	Tomas/Affia	-	-	-	14
	Tushka	-	6	29	40
	Abu Simbel	n.a.	12	53	70
	Ballana	-	-	-	5
(3)	Aswan - Wadi Halfa	6	14	23	36

Source: The JICA Study Team.

4.5.2 Current Development Projects

Of the transportation development projects listed in the current Five-Year Plan, those which cover the Project Area are as follows:

(i) Code No. 7/3/2-2 Aswan Airport Expansion (extension of runway to 3.5 km, construction of a terminal building and installation of aircraft guiding and illumination facilities)
(ii) Code No. 7/1/5-4 Purchase of a Floating Dock for High Dam Lake
(iii) Code No. 7/1/5-1 Development of Cairo - Aswan Navigation Route (improvement of the Assiut lock gate, dredging of the navigation channel, renewal and illumination of the Naga Hamady lock gate and illumination of bridges between Cairo and Naga Hamady).

Transportation development projects which are not included in the current Five-Year Plan but are presently being implemented, planned or considered by the Egyptian Government are as follows:

(i) Aswan - Sudan Border Road
In 1977, the Egyptian Ministry of Transport and the Sudan counterpart established respectively within their organizations an Egypt-Sudan Transport and Communications Integration Department for the purpose of accelerating the construction of an international highway to connect the two countries. Egypt is to build the road between Aswan and the border for an extension of about 320 km in three

stages and has completed the first stage covering Aswan to Kurkur. This highway, when completed, will become a major trunk route in the Project Area and play the most important role in the regional development.

(ii) Aswan - Berenice Road
This project is to provide Aswan with a direct access to the Red Sea, where a new port will be constructed at Berenice. A 17-month feasibility study is about to be commenced with UNDP financing.

(iii) A Fishing Port in the High Dam Area
A fishing port is to be constructed to the west of the High Dam and will support the fishery development, together with a fish processing complex nearby.

(iv) Purchase of Vessels for Aswan - Wadi Halfa Navigation Route
International bids are now being processed for the purchase, along with the floating dock, of two passenger vessels, three river buses, three pushers, six barges, and two ferry boats by the Nile Valley River Transportation Corporation.

(v) Opening of Ferry Service between Abu Simbel and Quastal/ Adendan
Technical feasibility of the project is now under review.

(vi) Construction of Railway between Aswan and Wadi Halfa
The idea is to provide a railway connection between Khartoum and the Mediterranean coast by closing the existing gap.

4.5.3 Basic Ideas for Developing Transportation Facilities

Transportation development projects in the largely uninhabited Project Area can be classified into three categories according to their objectives; namely, (i) international/inter-regional trunk routes, (ii) supportive transportation projects, and (iii) basic needs transportation services.

International or inter-regional trunk routes are to promote closer linkage and integration with other regions and constitute the backbone of the transportation network in the Project Area. Their development is indispensable for initiating the regional development in remote areas and therefore projects must be formulated not merely in terms of specific transportation demands or immediate cost-effectiveness but from the long-term perspective of over-all regional development requirements.

The most important objective of trunk route development in the Project Area is undoubtedly to provide overland access from the western shore of High Dam Lake, where a large number of agricultural and community development projects will be implemented, to Aswan City. This access road will not only serve the fundamental purpose of outgoing transportation of agricultural and mineral products and incoming transportation.

of construction materials, but will also function to provide a favorable psychological effect to the settlers by securing a ready access to Aswan City. This road is indispensable for the settlement plan in the western shore of the lake and will become an integral link for the traffic between Egypt and the Sudan.

Aswan is the southernmost city in Egypt, and a strategic node for transactions between Egypt and the Sudan. However, the volume of goods traffic has so far remained insignificant, and Aswan Governorate and areas in its vicinity depend heavily on the delta area for goods they consume. Imported goods are landed at Alexandria and transported along the Nile over a distance of more than 1,000 km to Aswan. The agricultural and fishery products of Aswan Governorate find their markets mostly in Lower Egypt. In this sense, the Project Area must be considered economically subordinate to the delta area. In this connection, it will be important to rehabilitate and upgrade the deteriorated sections of the National Highway Route 2 running Cairo - Luxor - Aswan.

This situation, however, would be substantially changed when the Aswan - Berenice road should be opened for direct access to the Red Sea. Berenice Port would become the exit for agricultural products of Southern Upper Egypt to neighboring countries and mineral products to Asia, Australia, and perhaps as far as the west coast of the United States. The port would also become the entrance for goods imported from Asia and Australia to be consumed in Aswan, Qena, and Sohag Governorates.

It is reasonable to expect in a long run a road extending from Aswan to the Southern New Valley where surveys have already identified highly fertile soils over a large expanse of alluvial plains. Then, Egypt would have a east-west development axis from the Red Sea to the New Valley which crosses the existing north-south axis along the Nile at Aswan. This importance in the national transportation network and the accruing advantages as a major national center for distribution will no doubt assure sizable industrial development in Aswan City. It is no exaggeration to say that the population and the industrial structure of the Project Area envisaged for the year 2000 in Section 3.2 of Chapter III will be possible only when Aswan City establishes its nodal position at the crossroads of the two inter-regional development axes. Because these inter-regional trunk roads require a huge outlay of capital, it is necessary to undertake detailed feasibility studies and to examine in the process their probable impact on the development of Southern Egypt in general and the Project Area in particular.

Road development on the eastern shore of High Dam Lake, where development projects will be smaller in number than on the western shore, will be of relatively low importance. The mining development of marble, talc, gold and copper, which are found widely scattered around El Allaqi alone will hardly justify road construction in economic terms. Therefore, timing of construction should be decided by taking into account the agricultural development schedule in El Allaqi. The outgoing traffic of mineral resources can be shipped to Aswan over the

lake during the earlier stage of development. The construction of road from El Allaqi to Quastal/Adendan will be by no means economically justifiable, because difficult terrains preclude any possibility of development unless some highly valuable mineral resources be found in great quantity. In any case, the construction of this section is a matter to be decided in the next century. Ferry service from Abu Simbel will provide a more convenient access to Quastal/Adendan.

The construction of a Aswan - Wadi Halfa railway behind the eastern shore of the lake is currently being contemplated, but the Study Team considers it hardly justifiable, at least not until well into the next century. The construction and maintenance costs of a railway are four to five times those of a road of the same length. Both passenger and goods movements between Aswan and Wadi Halfa are now of insignificant proportion and will reach only about 36,000 passengers and 168,000 tons of goods by the end of this century, assuming an optimistic high annual growth rate during the period. The closing of the missing link between Egyptian and Sudan railway systems will certainly facilitate an increase in passenger and goods traffic between the two countries. However, it must be emphasized that the quantity of goods which will economically justify the railway construction is not in the order of a few hundred thousand tons as optimistically expected but of a few millions per year.

Supportive transportation projects are primarily for facilitating projects in the productive sectors. Development of such projects as fishery ports, feeder roads to agricultural areas and mining sites, transportation services for tourists, a bridge across the Nile, etc. must be formulated on the bases of projected transport demands, evaluation of alternatives, cost-benefit analyses, the identification of primary beneficiaries and appropriate executing agencies, and so forth.

Basic needs transportation projects, such as simple quays for fishing villages, rural access roads and facilities for light aircraft or helicopter emergency landing, are for the purpose of securing basic minimum services for the inhabitants. Therefore, they should be justified in accordance with the national basic needs standards, the capacity of executing bodies and the availability of funds rather than their economic feasibility.

This Master Plan envisages a rapid growth of Aswan City in the future in view of its strategic position expected in the inter- and intra-regional transportation network. This means that large volumes of traffic will flow into the City from all directions. The intra-city traffic is also expected to increase in bounds, as the City expands into the outlying area and the number of automobiles increases in the City. Then, the solution of resultant traffic congestion, accidents and noise will emerge as an important issue for future transportation planning.

As the development progresses in the western lake shore, the heavy duty vehicle traffic accross the Nile will increase and overburden the passage way over the Old Dam, which was constructed in the beginning of this century. The expected congestion over the Dam will become

a great hazard to the Dam itself as well as to the traffic safety. Therefore, a bridge over the Nile will be needed to alleviate this bottleneck. Suitable location for the bridge will possibly be the vicinity of the abandoned facilities for shipping iron ores in the northern part of the City or the vicinity of Nag El Mahatta near the Old Dam. The width of the Nile is narrower at the former location, but the construction costs will be substantially lower at the latter, where there are islets in the Nile and the approach to the bridge can be shorter. On the other hand, the former location is more advantageous in that it will function as a by-pass for the through-traffic from Kurkur and further south to Lower Egypt which would have to pass otherwise through the downtown area of Aswan City. The latter location near the Old Dam is actually being considered in Aswan, and in this case it will be necessary to construct a by-pass for the through-traffic along the foot of the hills to the east of the existing downtown area.

There is an on-going project to construct the Aswan University campus in the area on the west bank between the Old and High Dams. Coupled with large-scale community development envisaged by the Study Team in the same area, this will necessitate the construction of a by-pass on the west bank behind the area to be so developed.

On the basis of the foregoing consideration, the expected transportation networks near the end of this century are formulated for the Project Area and Aswan City as shown in Figures 4-5-2 and 4-5-3.

4.5.4 Development Program for Transportation Sector

The development program for the transportation sector is shown in Table 4-5-7. Respective projects are scheduled on the bases of the implementation schedules envisaged for the projects identified in other sectors, the transportation demands forecasted in the beginning of this section, and the period of time necessary to complete each transportation development project. Prior to project implementation, a study and designing period of six to twelve months, in the case of a big project about two years, will be necessary. However, engineering costs of detailed study, designing, and others are excluded from the development costs shown on the table. Cost estimates at this stage are necessarily rough and indicate only the magnitude of the respective investment requirements. The total investment requirements shown in Table 4-5-7 are aggregated into three periods up to the end of this century as follows.

Period	1982-1987	1988-1992	1993-1997
Investment (£E mil.)	43.1	38.0	28.6

Figure 4-5-2 Transportation Networks in the Year 2000

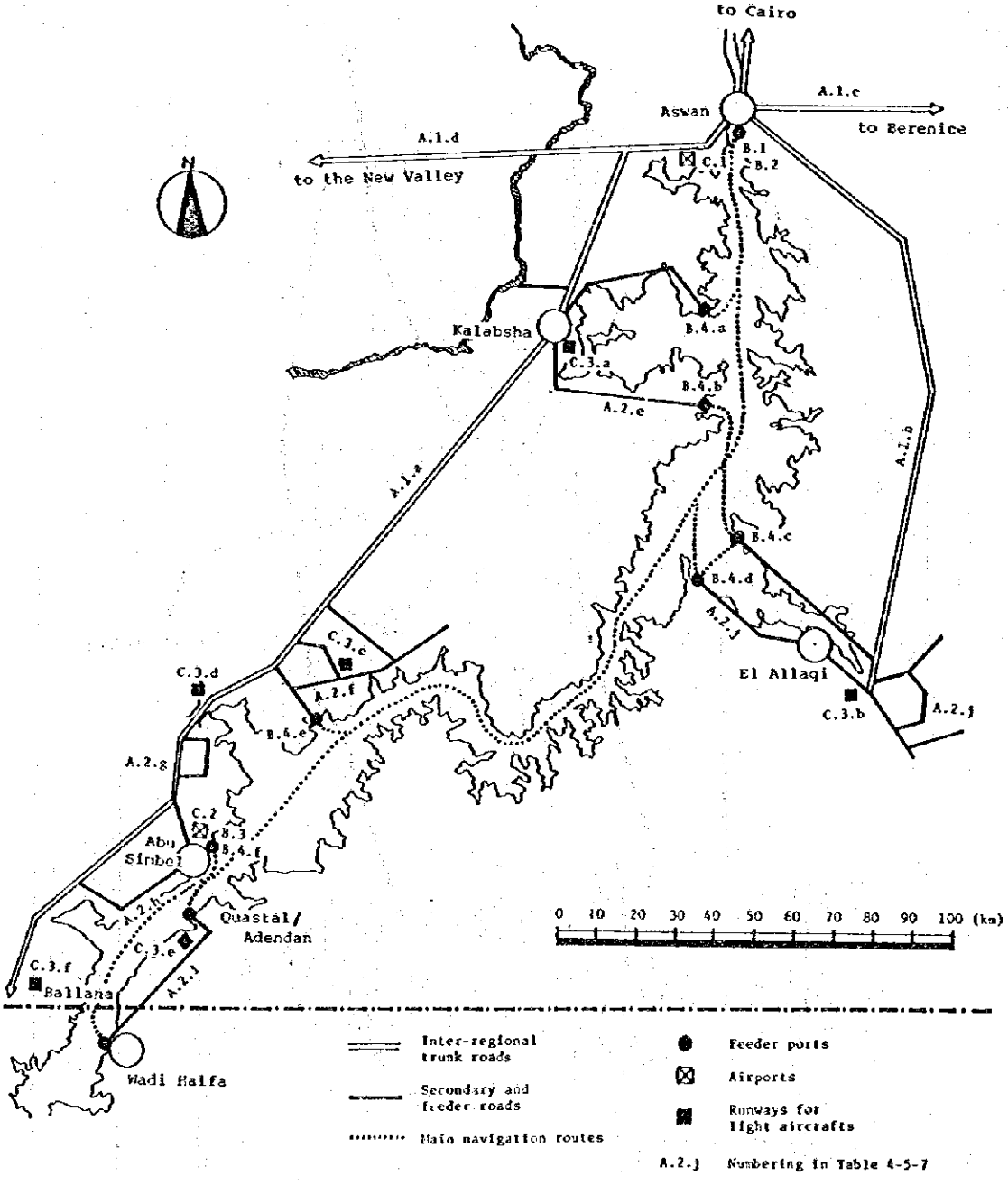


Figure 4-5-3 Future Road Network in Aswan City

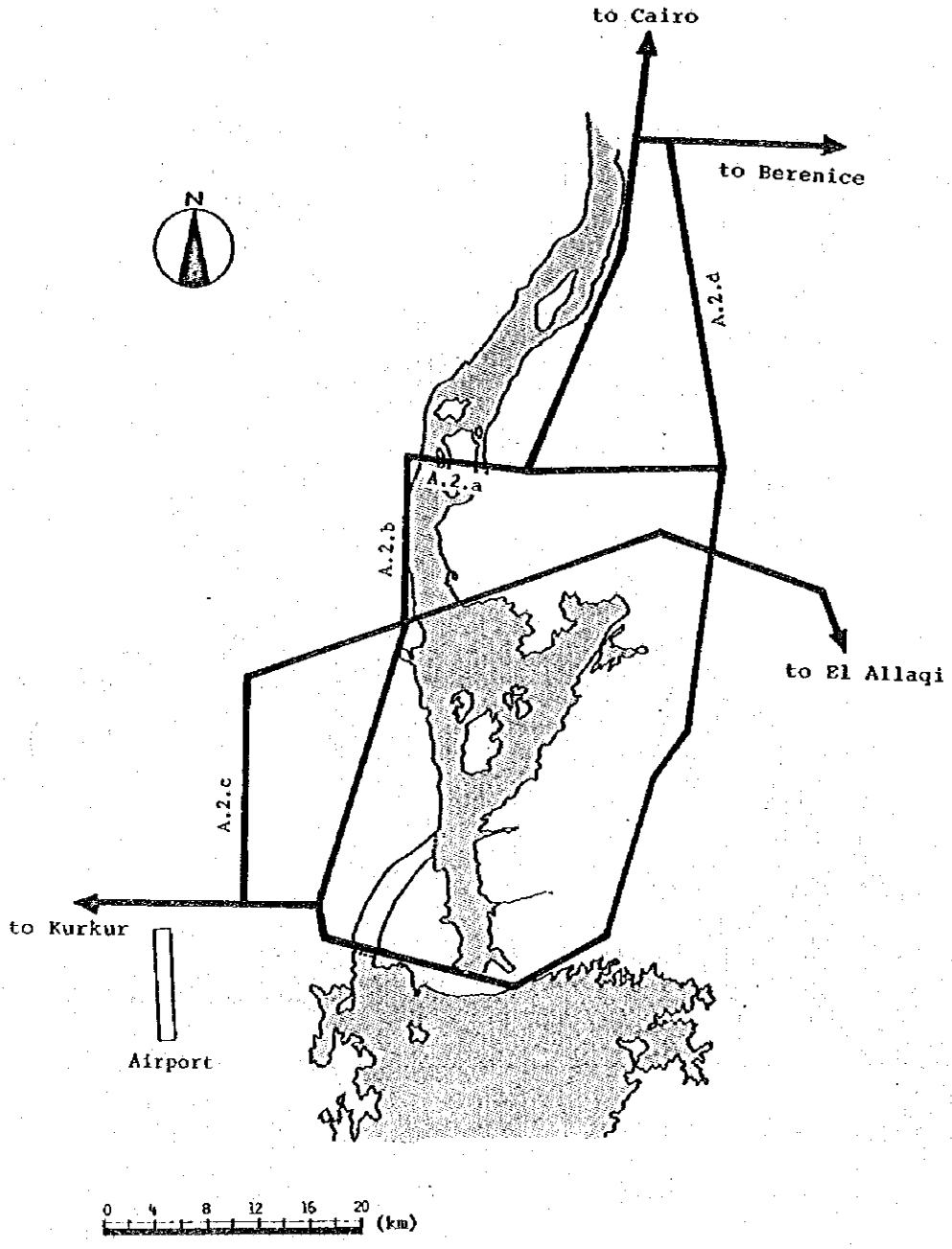


Table 4-5-7 Investment Schedule for Transportation Sector

Development Project	Implementation Schedule	Project Cost[1/] (£E million)
	1982 1987 1992 1997	
A. Roads and Bridges		
1. Inter-regional Trunk Roads		
a. Aswan-Sudan Border		16.2
Phase I (Kurkur-Tushka)		(10.7)
Phase II (Tushka-Sudan Border)		(5.5)
b. Aswan-El Allaqi		9.3
c. Aswan-Berenice		18.0
d. Aswan-New Valley (Baris)		16.8
Phase I (Kurkur-Limestone Quarry)		(1.5)
Phase II (Limestone Quarry-Baris)		(15.3)
2. Secondary/Feeder Roads		
a. El Shallal Bridge (Nag El Mahatta-Nag Siheil Gharb)		3.5
b. Aswan West Riverside Road (Aswan Dam-Nag El Madab)		0.7
c. Aswan New Town Road (Aswan Dam-Sahara City)		1.2
d. Aswan East by-pass		2.8

(continued on the next page)

Table 4-5-7 (continued)

Development Project	Implementation Schedule	Project Cost[1/] (£E million)
	1982 1987 1992 1997	
e. Kalabsha District Feeder Road		6.9
Phase I (60 km)		(3.3)
Phase II (65 km)		(3.6)
f. Tomas/Affia District Feeder Road		6.1
Phase I (70 km)		(3.9)
Phase II (40 km)		(2.2)
g. Tushka District Feeder Road		1.7
h. Abu Simbel District Feeder Road		4.2
Phase I (25 km)		(1.4)
Phase II (50 km)		(2.8)
i. Quastal-Wadi Halfa Road		2.8
j. El Allaqi District Feeder Road		8.2
Phase I (95 km)		(5.2)
Phase II (55 km)		(3.0)
B. Ports and Fleet		
1. Aswan East Port (expansion)		2.5
2. Aswan Fishery Port		1.2
3. Abu Simbel Fishery Port		0.5

Development Project	Implementation Schedule	Project Cost[1/] (£E million)
	1982 1987 1992 1997	
4. Feeder Port		
a. Kalabsha North		0.2
b. Dakka		0.2
c. El Allaqi North		0.2
d. El Allaqi South		0.2
e. Tomas/Affia		0.2
f. Abu Simbel		0.5
g. Quastal/Adendan		0.5
5. Purchase of Vessels		
Phase I		7.5
Phase II		10.0
C. Airports		
1. Aswan Airport (expansion)		2.5
2. New Abu Simbel Airport		6.0
3. Runway for Light Aircrafts		
a. Kalabsha		0.1
b. El Allaqi		0.1

(continued on the next page)

Table 4-5-7 (continued)

Development Project	Implementation Schedule	Project Cost[1/] (£E million)
	1982 1987 1992 1997	
c. Tomas/Affia		0.1
d. Tushka		0.1
e. Quastal/Adendan		0.1
f. Ballana		0.1

Note: 1/ 1979 prices.

Source: The JICA Study Team.

4.6 EDUCATION AND VOCATIONAL TRAINING

4.6.1 Basic Ideas for Development Planning

Educational development for the Project Area must take into account two primary requirements, First, education is one of the basic needs of the population, and consequently, accessibility to educational services must be extended as widely as possible and reach as many as people who wish to learn. Second, as stated in the current Five-Year Plan, education must meet the skill requirements of the growing economy and society and in this sense opportunities for practical and technical training must be improved and expanded.

Specifically in relation to the Project Area, two additional requirements must be considered. As already discussed in 3.2 of Chapter III, Aswan City is the major regional center to service not only the rest of the Project Area but also entire Aswan Governorate and probably Southern Upper Egypt as a whole. In this sence, the City should be provided with facilities for higher learning, the beneficiaries of which will serve a much wider area than the Project Area. The other requirement is that the more scattered distribution of communities in the lakeshore than in the existing inhabited area of the country necessitates wider distribution of smaller-sized schools in order to satisfy the basic need.

4.6.2 Development Program

According to the current Five-Year Plan, primary school enrollments will reach 100% of the school-age children, and the preparatory school education will become compulsory with a near-100% enrollment ratio by the end of 1981 when the Plan is scheduled to conspire. The Plan also envisages a substantial increase in the enrollment ratio in secondary education, though the objective is not given in quantitative terms. In addition, the proportion of the students in technical education is planned to increase to 60% of the total secondary school enrollments. Therefore, some 500,000 population increment expected in the Project Area during 1982 - 1997 must be provided with schools sufficient in number to maintain the national objectives.

Because it is difficult to predict the exact age composition of the expected population increment, however, the required educational development is estimated on the basis of the planning standards used by the Ministry of Development and New Communities for the development of new towns in the north, which are shown in terms of the service population sizes per school on each educational level. As shown in Table 4-6-1, the current standards in the Aswan Division generally conform to the planning standards used by MODANC, except that the size of schools as measured by the number of students per school is smaller except for the secondary schools. Since the City is expected to grow to the population size of 500,000 by the end of the century, the MODANC standards can be directly used for planning purposes. With respect to the rest of the Project Area, the current standards in the northern

area of Aswan Governorate, which is similar in the rural-urban distribution of population to the rest of the Project Area, are taken into consideration and the planning standards are modified, assuming smaller school sizes for respective educational levels, to approximate the standards to be used for Aswan City

Table 4-6-1 Planning Standards for Educational Development

	Current Standards (1978/79)1/		Planning Standards2/	
	Service Population	No. of Students per School	Service Population	No. of Students per School
Aswan Division:			Aswan Division:	
Primary Schools	3,000	430	4,000	600
Preparatory Schools	11,000	570	14,000	840
Secondary Schools	31,000	930	30,000	900
Rest of the Governorate:			Rest of the Project Area:	
Primary Schools	2,200	280	2,000	300
Preparatory Schools	10,500	440	8,000	400
Secondary Schools	30,000	550	25,000	400

Notes: 1/ Based on the information from RPA.
2/ Based on the information from MODANC on new town development. For the rest of the Project Area, standards are modified to allow for generally scattered distribution of settlements.

Sources: Regional Planning of Aswan,
Ministry of Development and New Communities.
The JICA Study Team.

Assuming the population increment of 300,000 and 200,000 persons respectively in Aswan City and the rest of the Project Area, the required number of primary and preparatory schools are 75 and 19 respectively in Aswan City and 100 and 25 respectively in the rest of the Project Area (Table 4-6-3). Among 18 proposed secondary schools, the number and kind of technical schools are determined mainly in accordance with the aforementioned national objective and the development prospects envisaged for the respective centers of development. Two new industrial

secondary schools will be able to satisfy the roughly estimated shortage of skilled workers in the mining/manufacturing and construction sectors through the year 2000, as indicated in Table 4-6-2. Especially in relation to the secondary education in the rest of the Project Area, it is desirable to establish comprehensive secondary schools which will give various vocational and practical training courses in addition to the general academic courses.

Table 4-6-2 Expected Incremental Demand for Technicians and Skilled Workers in Mining/Manufacturing and Construction

	Expected Increment of Demand 1/ 1982 - 2000			Total Supply from Existing Institutions 1982 - 2000	Balance
	Min./Manuf.	Const.	Total		
Skilled Workers	11,400	7,600	19,000	13,700 2/ (22,000) 3/	-5,300 (+2,300)
Technicians	7,400	3,800	11,200	10,800 4/	-400

Notes: 1/ Estimates by the Study Team.
2/ Annual outputs (from the existing industrial secondary schools in the Aswan Division) multiplied by 18 years.
3/ Annual outputs (from entire Aswan Governorate) multiplied by 18 years.
4/ Annual outputs (from the existing five-year technical school and the industrial division of the existing higher technical institute) multiplied by 18 years.

As already mentioned in Section 1.4.2 of Chapter I, the Aswan extension campus of Assiut University will be expanded to become a separate regional university by 1982. Considering the current over-supply of university graduates in Egypt as a whole in addition, it is safe to presume that the supply of professionals for the Project Area will be more or less sufficient.

With regard to technicians or sub-professionals, who are currently short of the demand in Egypt as a whole, the current training capacity in Aswan City nearly satisfies the expected incremental demand in the mining/manufacturing and construction sectors (Table 4-6-3). However, because the two existing institutions, that is, a five-year technical training school and a two-year higher technical institute, offer

Table 4-6-3 Expected Number of Education and Training Facilities and Required Investment

	No. of Schools		Investment Cost (£E million)
	Existing Schools	New Schools	
Aswan City			
Primary	63	75	16.9
Preparatory	17	19	11.4
General Secondary	2	6	6.0
Industrial Secondary	2	1	1.5
Commercial Secondary	2	2	2.5
Agricultural Secondary	0	1	1.6
Higher Technical Institute	1	1	1.5
Indus. Vocational Center	1	1	0.5
Const. Vocational Center	0	2	1.0
Rest of the Project Area			
Primary	0	100	12.0
Preparatory	0	25	7.5
General Secondary 1/	0	2	1.4
Comprehensive Secondary 2/	0	3	2.7
Industrial Secondary 3/	0	1	1.2
Commercial Secondary 4/	0	1	0.9
Agricultural Secondary 5/	0	1	1.2
	Total Investment		69.8

Notes: 1/ Kalabsha and Abu Simbel
2/ El Allaqi, Tushka and Tomas/Affia
3/ Kalabsha
4/ Abu Simbel
5/ Kalabsha

Source: JICA Study Team.

courses mostly on industrial subjects such as metal fabrication, mechanics, electrical works, etc., it will be necessary to establish another higher technical training institute which emphasizes various building trades, including civil engineering, with an annual output of about 360 graduates. The two institutes will be albe to satisfy more than the demand in the Project Area, having a surplus available to the rest of the Governorate or even Region 8.

In addition to the formal educational facilities mentioned above, it will be necessary to establish some vocational training centers specialized in industrial and construction trades to train semi-skilled workers in short-term courses (3 - 12 months). The Project Area will be especially in need of training centers on building and construction trades like the kind currently run by the Ministry of Housing elsewhere in the country.

Rough costing for required educational and training facilities is done in Table 4-6-3, based on the total costs per school used by the MODANC for new town planning, with some modifications for the smaller sizes of schools in the rest of the Project Area. Table 4-6-4 indicates the tentative investment schedule for secondary and higher educational facilities over the period from 1982 - 1997. The investment costs and schedule for primary and secondary schools are included in the urban and community development costs in Section 4.8 of this chapter.

Table 4-6-4 Investment Schedule for Secondary and Higher Education

Projects (no. of schools)	Project Cost (£E mil.)	'82	'87	'92	'97
Aswan		2 schools	2 schools	2 schools	
General Sec. (6)	6.0				
Agricultural Sec. (1)	1.6				
Commercial Sec. (2)	2.5				
Industrial Sec. (1)	1.5				
Higher Tech. Inst. (1)	1.5				
Kalabsha					
General Sec. (1)	0.7				
Agricultural Sec. (1)	1.2				
Industrial Sec. (1)	1.2				
Abu Simbel					
General Sec. (1)	0.7				
Commercial Sec. (1)	0.9				
El Allaqi					
Comprehensive Sec. (1)	0.9				
Tushka					
Comprehensive Sec. (1)	0.9				
Tomas/Affia					
Comprehensive Sec. (1)	0.9				
Total Costs	20.5		3.6	8.25	8.65

Note: The development of primary and preparatory schools are included in the costs of urban and community development in Section 4.8.

4.7 PUBLIC HEALTH

4.7.1 Special Requirements

(1) Prevention of Schistosomiasis

Most of the fishermen now working in High Dam Lake come from rural areas in Sohag and Qena Governorates and many of them have been found infected with schistosome. The chances of re-infection can be avoided through intensive control and treatment of schistosomiasis in Sohag and Qena, and this will minimize the danger of transmitting the disease into High Dam Lake. A new intensive control program has been started in Upper Egypt in 1979, requiring all fishermen to have their schistosome infection treated in their home villages prior to entering the lake.

In setting up fishermen's villages in the foreshore, care must be taken to control the danger of contaminating the lake water with urine-transmitted schistosome eggs. Once intermediate snails, which are already present in the lake, are infected, the transmission cycle from one man to another will immediately and inevitably begin. The use of the molluscicide like Baluciclde in the large lake would be hardly effective and even if tried, it will need a huge amount of money to eradicate Bulinus snails completely from the coastline of more than 8,000 km.

Foreshore fishing-cum-agricultural communities must be located in an appropriate distance from the shoreline, ideally 1 km according to the prescription of the Ministry of Health. In addition, it is indispensable that each and every household be supplied with purified water, together with the installment of a latrine and a sceptic tank to prevent water from contamination. The construction of laundry and bathing facilities is also necessary for the same reason. To prevent children from swimming in the contaminated canal or lake water, it is suggested to construct a swimming pool.

Health education is necessary to help settlers realize the danger of schistosomiasis by means of posters, slides and films. Furthermore, it is necessary to inform them of the available control measures against schistosomiasis. It goes without saying that unless there is active participation of the individuals in the control program, it is difficult to achieve the lasting, positive results.

More than 300 small fishing camps are presently scattered along the shoreline. Ideally, these camps should be equipped with simple but effective potable water supply and sewage disposal facilities. When the foreshore villages of fishermen are completed, it will be possible to have the schistosome-infected fishermen treated regularly in their respective villages with the application of Metrifonate. In the present condition, the entry examination and/or the treatment of schistosomiasis at Aswan City should be carried out strictly without exception. The use of Metrifonate is preferred to Ambilhar for the treatment of schistosomiasis.