CHAPTER 3 PRODUCTION AND CONSUMPTION

3.1 General

3.1.1 Classification of Commodities

The commodity classification list to be used by this Study was prepared by the following process. The commodities studied under ENTS II and III studies were reviewed. Available domestic production data for all agriculture, industrial, mining and construction commodities for the base year 1989 were arranged in one table (Table 3-1-1).

Table 3-1-1 Major Commodities Produced in Egypt in 1989

(unit 1000 t)

Seq	Products	1989	%	Acc %	Seq	Products	1989	%	Acc %
1	Crude Petroleum	43,000	18.0	18.0	23	Gypsum	1,279	0.5	89.1
2	Sand	29,900	12.5	30.6	24	Salt	1,125	0.5	89.5
3	Lime Stone	28,800	12.1	42.7	25	Phosphate Fertilizer	1,021	0.4	90.0
4	Gravel	25,200	10.6	53.3	26	Water Melon	1,000	0.4	90.4
5	Cement	12,480	5.2	58.5	27	White Sand	943	0.4	90.8
6	Sugar Cane	11,213	4.7	63.2	28	Dolomite	927	0.4	91.2
7	Fuel Oil	10,431	4.4	67.6	29	Acetylene	911	0.4	91.5
8	Clay	7,534	3.2	70.7	30	Cotton raw	820	0.3	91.9
9	Natural Gas	5,504	2.3	73.1	31	Knitwear	744	0.3	92.2
10	Nitrate Fertilizer	4,539	1.9	75.0	32	Beets	685	0.3	92.5
11	Maize	4,529	1.9	76.9	33	Gypsum Products	660	0.3	92.8
12	Tomato	3,997	1.7	78.5	34	Grapes	621	0.3	93.0
13	Diesel Oil	3,777	1.6	80.1	35	Soft Drinks	604	0.3	93.3
14	Wheat	3,182	1.3	81.5	36	Millet	585	0.2	93.5
15	Rice	2,679	1.1	82.6	37	Asphalt	580	0.2	93.8
16	Basalt	2,468	1.0	83.6	38	Date	572	0.2	94.0
17	Iron Ore	2,405	1.0	84.6	39	Red/Sand Bricks	559	0.2	94.2
18	Kerosene	2,385	1.0	85.6	40	Cotton Seed	498	0.2	94.5
19	Gasoline	2,352	1.0	86.6	41	Beans	460	0.2	94.7
20	Potato	1,657	0.7	87.3		Others	12,747	5.3	100.0
21	Phosphate	1,505	0.6	87.9					
22	Orange	1,398	0.6	88.5		Total	238,276		

Source: CAPMAS Statistical Year Book

As the table shows, the annual production of 41 commodities, by weight, accounted for 95% of total annual production in 1989, and the production of ten commodities covered 75% of the total. It was considered necessary, in principal to classify these commodities independently, without aggregation into groups of similar commodities.

The production of such commodities, as alumina and dates, which were studied independently under ENTS II and III were grouped with other similar commodities in this Study's classification from the point of view of their small domes-

tic production. On the other hand, it was decided to disaggregate some commodities, such as meat, poultry, dairy products and fish, which were grouped under one heading in the previous studies.

On the basis of the Standard International Trade Classification for commodities, prepared by the United Nations, and the Egyptian Commodity Classification guide published by CAPMAS, the classification of commodities, as shown in Table 3-1-2, was then prepared.

The commodities are classified into six commodity groups; crude oil & petroleum, construction materials, minerals, agricultural products, industrial products, and mixed commodities. Each group in turn contains a number of sub-groups. For instance, group 2 - construction materials, has two sub-groups of (4) cement and (5) other construction materials. A number of items are aggregated under some of the sub-groups (example: cement and limestone under sub-group (4) cement), while other sub-groups contain only one commodity (example phosphate). To formulate an understanding of the present conditions the surplus/deficit analysis was conducted on the commodity item level; i.e. for 70 items which form the 30 sub-groups.

3.1.2 Data Collection and Company Survey

Data on production and consumption of the Study commodities were collected by reviewing existing statistics and conducting a survey of a number of commodity producing companies. The base year of 1990 was chosen.

1) Company Survey

Table 3-1-3 shows the number and classification by activity and sector of the commodity producing companies chosen for the survey, and the actual number of companies surveyed.

The public sector plays a major role in all the industrial activities and it was therefore decided to try and cover all the public sector commodity producing companies in the survey. These companies are belonging to the related ministries such as Ministry of Industry, Ministry of Supply, etc. The private sector has recently become active in such industries as food production, textiles and clothes, and furniture and household goods. This was taken into consideration in preparing the companies survey list.

Table 3-1-2 Transport Commodity Classification

TRANSPORT COMMODITY CLASSIFICATION

SEQ	JICA STUDY	ENTS II&III	PRODUCTS
	0. EMPTY		
1	00	0	Empty, Empty Container
	1. CRUDE OIL & PETROLEUM PRODUCTS		
2	01	0 01	Crude Oil
3	02	0 02	Petroleum Products
4		1	1 Gasoline
5		2	2 Fuel Oil
6		3	3 Diesel Oil
7		4	4 Kerosine
8		5	5 Other Petrolem Products
9	03	0 03	Natural Gas
	2. CONSTRUCTION MATERIALS		
10	04	0 04	Cement
11		1	Lime Stone
12		2	Cement/Clinker
13	05	0 05	Other Construction Material
14		1	1 Gravel/Sand/Earth
15		2	2 Bricks
16		3	3 Gypsum/Plaster
17		4	4 Glass/Ceramic
18		5	5 Other Construction Materials
	3. MINERALS		
19	06	0 06	Phosphate
20	07	0 07	Iron Ore
21	08	0 08	Coal/Coke
22	09	0 09	Other Minerals
		1	1 Alumina
23		1	2 Salt
24		2	3 Sulpher/Pyrites
25		3	4 Kaolin/Clay
26		4	Other Minerals
	4. AGRICULTURAL PRODUCTS		
27	10	0 10	Wheat
28	11	0 11	Other Cereals
29		1	1 Millet/Sorghum
30		2	2 Rice
31		3	3 Barley
32		4	4 Corn/Maize
33		5	Products of Milling Industry
34		6	5 Other Cereals
35	12	0 12	Fruits/Vegetables
36		1	1 Citrus/Orange
			2 Dates
37		2	3 Grapes
38		3	7 Melon/Water Melon
39		4	4 Other Fruits
40		5	5 Potatos
41		6	6 Tomatos
42		7	Onion
43		8	8 Other Vegetables
44	13	0 13	Sugar Cane
45	14	0 14	Fibre Crops
46		1	1 Cotton and Cotton Seeds
47		2	2 Other Fibre Crops
48	15	0 15	Live Stocks
49	16	0 16	Animal Products
50		1	1 Meat
51		2	Poultry
52		3	Dairy Products
53		4	2 Fish
54	17	0 17	Other Agricutural Products
55		1	1 Oil Crops
56		2	2 Food Legminous Crops
57		3	4 Tobacco
58		4	5 Other Agricultural Products
	5. INDUSTRIAL PRODUCTS		
59	18	0 18	Sugar
60		1	Refined Sugar
61		2 19	Molasses
62	19	0 20	Edible Oil/Fats
63	20	0 21	Animal Feed
64	21	0 22	Bevarages
65	22	0 23	Other Food Products
66		1	2 Tea/Coffee
67		2	3 Food Preserves
68		3	4 Other Food Products
69	23	0 24	Chemical Products
70		1	1 Organic Chemical Products
71		2	2 Inorganic Chemical Products
72		3	3 Detergents/Soaps
73	24	0 25	Metal and Metal Products
74		1	1 Ferrous Metal Products
75		2	2 Non Ferrous Metal Products
76	25	0 26	Textiles
77		1	1 Cotton Yarn/Textiles
78		2	Wool/Wool Textile
79		3	2 Other Yarn/Textiles
80	26	0 27	Manufactured Fertilizer
81	27	0 28	Pulp/Paper
82		1	1 Pulp
83		2	2 Paper and Paper Products
84	28	0 29	Lumber/Timber
85	29	0 30	Other Manufactured Goods
86		1	Electric and Mechanical Goods
87		2	Other Manufactured Goods
	6. MIXED COMMODITIES		
88	30	0	Mixed Commodities
89		1	Daily Goods
90		2	Others

Table 3-1-3 Commodity Companies Survey

Activity Sector	Plan			Actual		
	Public	Private	Total	Public	Private	Total
1.AGRICULTURE						
- Crops	12	0	12	7	0	7
- Animal Products	8	0	8	7	0	7
2.INDUSTRY						
- Food Products	14	31	45	13	29	42
- Spinning & Weaving	5	4	9	5	12	17
- Chemicals	19	14	33	12	13	25
- Metal Products	11	8	19	6	11	17
- Electrical & Household Goods	7	12	20	3	17	20
- Mining	6	0	6	4	0	4
3.CRUDE OIL & PETROLEUM PRODUCTS	7	0	7	7	0	7
4.CONSTRUCTION PRODUCTS						
- Cement Production and Products	6	1	7	6	1	7
- Mining	1	4	5	0	2	2
- Construction Materials	4	6	10	4	14	18
5.FOREIGN TRADE						
- General Products Export/Import	7	0	7	5	0	5
- Cotton Export/Import	5	0	5	2	0	2
6.MILLING INDUSTRY						
- Grain Mills	8	0	8	8	1	9
- Grain Storage and Distribution	1	0	1	1	0	1
- Rice Hulling	2	0	2	2	0	2
- Rice Storage and Distribution	1	0	1	1	0	1
7.WHOLESALERS						
- Food and Animal Products	3	0	3	3	0	3
- Textiles	1	0	1	0	0	0
- Electrical Equipment	1	0	1	0	0	0
- Chemical Products	1	0	1	0	0	0
Total	130	80	210	96	100	196

The interview items covered the following;

(1) Company scale
- Public/private sector
- Number, size and location of branches
- Capital, employees
- Vehicle fleet, by type, age and condition

(2) Company activity
- Raw materials used, by type, amount, origin and mode of transport, and monthly consumption

- Products by type, amount, destination and transport mode, and monthly production
- Annual production and transported goods amounts

2) Available Statistics

Various statistics were collected and reviewed to gather information on domestic production, consumption and exports/imports of commodities. Interviews were also conducted as necessary. The base year of 1990 was applied as 1991 data is not available for most commodities.

(1) CAPMAS

CAPMAS year books and various publications concerning agriculture and industrial production were collected. Exports and imports of the major commodities for a five year period and by Egyptian port of entry or exit, were collected from CAPMAS.

Although production and export/import figures were adequately covered in the CAPMAS statistics, the majority of publications concerning commodity consumption basically distributed consumption by population. However consumption figures for such commodities as manufactured fertilizers by location and amount were very useful.

(2) Ministry of Agriculture

Production amount, area and distribution by governorate for 87 agriculture products were collected from the ministry's information bank, for the years 1989 and 1990.

(3) Ministry of Industry

The information bank of the General Organization for Industry (GOFI) provided valuable information on the 1990 production of 42 commodities by amount and governorate.

(4) Egyptian General Petroleum Corporation (EGPC)

EGPC provided information on consumption of major petroleum products by governorates for the three year period of 1989 to 1991. Adequate information on production of crude oil and petroleum products was obtained from the EGPC's annual reports.

(5) Ministry of Reconstruction

The annual report of the ministry was used to obtain production data on construction materials the ministry produces. These were supplemented by data from CAPMAS statistics to provide total production.

(6) New 3rd Five-Year Plan (1992/93 - 1996/97)

Production, consumption and export/import figures for a total of 188 commodities for the 1992/93, 1993/94 and 1996/97 are forecast in the new five-year plan. These figures were reviewed and compared with the present corresponding figures.

3.1.3 Production and Foreign Trade Figures

1) Production and Local Consumption

Results of the data collection are shown in Table 3-1-4. Data was collected from many sources, and in many instances production figures for some commodities differed from source to source. Through review of past data and reports and interviews the most reliable figures were determined. Collected data was augmented by the results of the company survey.

The share of each commodity group with respect to local consumption is as follows;

Commodity Group	Share(%)
Crude Oil and Petroleum Products	15
Construction Materials	56
Minerals	5
Agricultural Products	18
Industrial Products	6
Total	100

2) Foreign Trade

Table 3-1-4 shows the amounts of imports and exports by commodity and the shares by sea ports are shown in Table 3-1-5 for year 1990. Imports were twice the amount of exports in terms of weight, and the major import commodities were agricultural commodities of (10) wheat and (11) other cereals which together accounted for 42% of total imports, followed by (8) coal (8%) and (2) petroleum products (7%). In the case of exports, the leading export commodity was (1) crude oil (45% of total exports), (2) petroleum products (28%) with agricultural products (11%) in the third place.

Table 3-1-4 1990 Domestic Production and Foreign Trade Quantities of Study Commodities (1)

Table 3-1-4 1990 Domestic Production and Foreign Trade Quantities of Study Commodities (1)

(unit 1000 tons)

Seq.	Code	Item	Production	Import	Export	Local Consumption (P+I)-E
		0. EMPTY				
1	00.0	Empty, Empty Container				
		1. CRUDE OIL & PETROLEUM PRODUCTS				
2	01.0	Crude Oil	28,994 *1	0 *1	4,655 *2	24,339
3	02.0	Petroleum Products	23,157	1,331	2,833	21,655
4	02.1	Gasoline	2,172 *3	0 *7	0 *7	2,172
5	02.2	Fuel Oil (Mazout)	11,312 *1	0 *1	1,176 *1	10,136
6	02.3	Gas Oil/Diesel	4,230 *1	329 *1	77 *1	4,482
7	02.4	Kerosine	2,334 *1	0 *1	0 *1	2,334
8	02.5	Other Petroleum Products	3,109 *1	1,002 *1	1,580 *1	2,531
9	03.0	Natural Gas	6,110 *1	0 *1	0 *1	6,110
		Sub-total	58,261	1,331	7,488	52,104
		2. CONSTRUCTION MATERIALS				
10	04.0	Cement	44,926	244	7	45,163
11	04.1	Lime Stone	28,800 *3	0 *2	0 *2	28,800
12	04.2	Cement/Clinker	16,126 *6	244 *6	7 *2	16,363
13	05.0	Other Construction Materials	155,073	112	19	155,167
14	05.1	Gravel/Sand/Earth	61,092 *3	10 *2	3 *2	61,098
15	05.2	Bricks	92,000 *11	4 *2	0 *2	92,004
16	05.3	Gypsum/Plaster	1,802 *3	1 *2	0 *2	1,803
17	05.4	Glass/Ceramic	33 *3			33
18	05.5	Other Construction Materials	146 *3	98 *2	15 *2	229
		Sub-total	199,999	356	26	200,329
		3. MINERALS				
19	06.0	Phosphate	947 *7	0 *2	308 *2	639
20	07.0	Iron Ore	2,405 *3	1,210 *6	37 *2	3,578
21	08.0	Coal/Coke	1,131 *11	1,518 *2	113 *2	2,535
22	09.0	Other Minerals	9,774	274	136	9,912
23	09.1	Salt	1,125 *3	1 *2	134 *2	991
24	09.2	Sulpher/Pyrites	2 *10	190 *10	1 *10	191
25	09.3	Kaolin/Clay	7,683 *3	8 *2	0 *2	7,691
26	09.4	Other Minerals	963 *3	75 *6		1,038
		Sub-total	14,257	3,001	594	16,664
		4. AGRICULTURAL PRODUCTS				
27	10.0	Wheat	4,268 *8	5,438 *7	0 *7	9,706
28	11.0	Other Cereals	19,724	2,601	194	22,132
29	11.1	Millet/Sorghum	628 *3	NA	NA	628
30	11.2	Rice	3,168 *8	2 *2	193 *2	2,978
31	11.3	Barley	150 *8	0 *2	0 *2	150
32	11.4	Corn/Maize	4,799 *8	1,359 *7	0 *2	6,158
33	11.5	Products of Milling Industry	10,980 *7	1,240 *7	1 *2	12,219
34	11.6	Other Cereals				
35	12.0	Fruits/Vegetables	15,285	44	752	14,576
36	12.1	Citrus/Orange	2,037 *8	0 *2	150 *2	1,887
37	12.2	Grapes	585 *8	0 *2	0 *2	585
38	12.3	Melon/Water Melon	1,287 *8	0 *2	5 *2	1,282
39	12.4	Other Fruits	1,731 *8	9 *10	140 *10	1,600
40	12.5	Potatoes	1,638 *8	26 *2	136 *2	1,528
41	12.6	Tomatoes	4,234 *8	0 *2	20 *2	4,213
42	12.7	Onions	577 *3	0 *2	20 *2	557
43	12.8	Other Vegetables	3,196 *3	9 *10	280 *10	2,925
44	13.0	Sugar Cane	11,144 *3	0 *2	1 *2	11,143
45	14.0	Fibre Crops	1,428	23	136	1,315
46	14.1	Cotton and Cotton Seed	1,342 *8	0 *7	126 *7	1,216
47	14.2	Other Fibre Crops	86 *3	23 *7	10 *10	99
48	15.0	Livestocks	2,159 *8	11 *10	6 *10	2,164
49	16.0	Animal Products	1,704	416	13	2,106
50	16.1	Meat	533 *8	159 *2	4 *2	688
51	16.2	Poultry	636 *8	2 *2	2 *2	637
52	16.3	Dairy Products	228 *3	116 *2	4 *2	340
53	16.4	Fish	306 *5	138 *2	3 *2	441
54	17.0	Other Agricultural Products	1,452	294	20	1,725
55	17.1	Oil Crops	180 *3	35 *10	15 *10	200
56	17.2	Food Legminous Crops	1,072 *3	210 *10	5 *10	1,277
57	17.3	Tobacco	0 *7	49 *2	0 *2	48
58	17.4	Other Agricultural Products	200	NA	NA	200
		Sub-total	57,163	8,826	1,121	64,868

Table 3-1-4 1990 Domestic Production and Foreign Trade Quantities of Study Commodities (2)

Seq.	Code	Item	Production	Import	Export	Local Consumption (P+I)-E
		5. INDUSTRIAL PRODUCTS				
59	18.0	Sugar	1,068 *3	767 *2	115 *2	1,720
60	18.1	Refined Sugar	853 *3	767 *2	4 *2	1,616
61	18.2	Molasses	215 *3	0 *2	111 *2	104
62	19.0	Edible Oil Fats	138 *7	450 *7	0 *7	588
63	20.0	Animal Feed	3,219 *7	76 *2	0 *2	3,295
64	21.0	Beverages	599 *3	1 *2	153 *2	447
65	22.0	Other Food Products	369	101	0	470
66	22.1	Tea/Coffee	0 *7	51 *7	0 *7	51
67	22.2	Food Preserves	25 *3	NA	NA	25
68	22.3	Other Food Products	345 *3	50 *7	0 *7	395
69	23.0	Chemical Products	779	391	59	1,111
70	23.1					
71	23.2	Organic/Inorganic Chemicals	362 *3	383 *2	38 *2	707
72	23.3	Detergents/Soaps	417 *3	8 *2	21 *2	404
73	24.0	Metal and Metal Products	3,127	1,550 *2	372 *2	4,305
74	24.1	Ferrous Metal Products	2,593 *7	1,514 *2	245 *2	3,862
75	24.2	Non-ferrous Metal Products	534 *3	36 *2	127 *2	442
76	25.0	Textiles	2,388	37	246	2,179
77	25.1	Cotton Yarn/Textiles	1,750 *9	8 *2	238 *2	1,520
78	25.2	Wool/Wool Textile	581 *9	5 *2	6 *2	579
79	25.3	Other Yarn/Textiles	57 *7	24 *7	1 *7	80
80	26.0	Manufactured Fertilizer	5,695 *3	484 *2	54 *2	6,125
81	27.0	Pulp/Paper	237	432	17	652
82	27.1	Pulp	22 *7	68 *2	0 *2	90
83	27.2	Paper and Paper Products	215 *7	364 *2	17 *2	562
84	28.0	Lumber/Timber	1,030	1,145 *2	5 *2	2,170
85	29.0	Other Manufactured Goods	144	56 *2	2 *2	198
86	29.1	Electric and Mechanical Goods	111 *3	*	*	111
87	29.2	Other Manufactured Goods	33 *3	*	*	33
		Sub-total	*18,793*	*5,489*	*1,024*	*23,259*
		TOTAL	348,472	19,005	10,253	357,224

Note 1: Data Sources:
*1 EGPC 1990 Annual Year Book
*2 CAPMAS Foreign Trade Data Bank
*3 CAPMAS Statistical Year Book
*4 New Five-Year Plan
*5 Estimate based on CAPMAS data for other years
*6 Ministry of Maritime Transport
*7 Central Bank of Egypt Statistics
*8 Ministry of Agriculture
*9 Ministry of Industry
*10 Estimate based on New Five Year Plan figures
*11 JICA Study Company Survey Results

Note 2: Composition of some of the Study Commodities
1. Crude Oil Production does not include foreign partner's share which is 14,958 (1000 tons)
14. Sand (Common) + Gravel + Sand (White) + Basalt + Granite + Sandstone
15. Red Bricks + Sand Bricks + Refractory Bricks
16. Agricultural Gypsum + Construction Gypsum and Plastic of Paris
17. Glass Sheets + Safety Glass + Ceramics
18. Clay Pipes + Concrete Pipes + Asbestos Sheets & Pipes
26. Quartz + Asbestos & Fermacolite + Dolomite
33. Flour of Wheat, Maize and Barley
36. Orange + Mandarin + Sweet Lemon + Citron Lemon + Bitter Orange + Grape Fruit
46. Cotton Seed + Cotton Raw
47. Linen
52. White Cheese + Processed Cheese + Pasteurized Milk
55. Linen Seed + Peanuts + Sesame + Soybeans
56. Bean + Beet + Chickpeas + Fenugreek + Lentil + Lupine
59. White Sugar Crystal + Refined Sugar + Glucose + Molasses
60. White Sugar Crystal + Refined Sugar + Glucose
64. Soft Drink + Beer + Non-Alcoholic Beer + Alcoholic Drinks
66. Tea
67. Preserved Vegetable + Tomato Paste + Canned Vegetable + Canned Saradine
68. Chocolate + Pastries + Candies + Yeast + Starch + Tobacco
71. Glycerine + Sulphuric Acid + Caustic Soda + Feroselikan + Carbon Dioxide + Chlorine + Mixed Fertilizers + Trible Phosphate + Oxygen + Acetylene + Insecticides + Glue
74. Steel & Iron Castings + Cast Iron + Reinforced Iron + Steel Blocks Iron Pipes & Accessories + Malleable Iron
75. Lead Products + Sanitary Appliances + Asbestos Materials
79. Silk and Artificial Fibres + Jute Yarn
80. Calcium Nitrate Fertilizer + Super Phosphate Fertilizer
81. Paper Paste + Writing/Printing Paper + Cardboard & its Products + Newsprint Paper
86. Air Conditioners + Refrigerators + Washing Machines + Water Heaters + Electric Heaters + Cables + Electric Meters + Accumulatores + Batteries + Bulbs + Radios + TV Sets
87. Truck + Bus + Car + Tractor + Bicycle + Butagaz Container + Water Meter

Alexandria Governorate sea ports of Alexandria and Dakhalia continued to be the main venues for exports and imports, with 66% of the total exports and imports respectively. Suez was second, followed by Port Said. Commodities imported via Alexandria are diversified, and the same can be noted for Port Said. On the other hand, the ports of Damyetta (wheat imports 84% of total imports at that port), Suez (crude oil and petroleum products 64%), and Safaga (wheat 66%) appear to be specialized ports. It is interesting to note that agricultural crops are exported mainly via the two ports of Suez and Port Said, and not via Alexandria and Damyetta which are more suitably located closer to the agricultural producing areas. Safaga is the only port where phosphate is exported.

Table 3-1-5 Foreign Trade share by Sea Port in 1990/1991 (1)

A - Imports Unit:1,000 ton

COMMODITY	Total	Sea Ports				
		Alexandria & Dikheila	Port Said	Damyat	Suez	Safaga
1. Wheat	5110	1160	799	1707	673	771
2. Flour	321	304	17	0	0	0
3. Corn/Maize	944	94	745	105	0	0
4. Cement	83	0	79	0	4	0
5. Coal	1337	1309	0	0	0	28
6. Fertilizer	741	741	0	0	0	0
7. Wood	1151	1040	0	111	0	0
8. Aluminum	1153	778	0	0	0	375
9. Fer. Metal Prod.	1751	1723	22	6	0	0
10.Crude Oil, Pet. Prod. & Chemicals	8180	5446	4	0	2730	0
11.Others	7643	6105	556	112	870	0
Total	28414	18700	2222	2041	4277	1174

Table 3-1-5 Foreign Trade by Sea Port in 1990/1991 (2)

B - Exports Unit:1,000 ton

COMMODITY	Total	Sea Ports				
		Alexandria & Dikheila	Port Said	Damyat	Suez	Safaga
1. Phosphate	218	0	0	0	0	218
2. Coal	4	0	0	0	0	4
3. Cement, Lime and Gypsum	12	0	0	0	12	0
4. Fertilizer	105	30	0	6	69	0
5. Crops	293	0	81	19	193	0
6. Petroleum	3059	2185	346	0	528	0
7. Molasses	90	90	0	0	0	0
8. Others	1927	1381	198	0	348	0
Total	5708	3686	625	25	1150	222

Source: Ministry of Maritime Transport

3.2 Crude Oil and Petroleum Products

3.2.1 Production

Table 3-2-1 shows the 1990 production of the three sub-groups of crude oil, refined petroleum products (source EGPC annual report) and natural gas distributed by governorate.

Table 3-2-1 Production Distribution of Crude Oil & Petroleum Products Sub-Groups by Governorate in 1990

(unit: 1000 t)

Governorate	(1) Crude Oil	(2) Petroleum Product	(3) Natural Gas	Governorate	(1) Crude Oil	(2) Petroleum Product	(3) Natural Gas
01 Cairo	0	6,195	0	22 Beni Suef	0	0	0
02 Alexandria	0	7,982	1,417	23 Fayoum	0	0	0
03 Port Said	0	0	0	24 Minya	0	0	0
04 Suez	0	5,931	0	25 Asyut	0	1,480	0
11 Damietta	0	0	0	26 Sohag	0	0	0
12 Dakahlia	0	0	2,628	27 Qena	0	0	0
13 Sharkia	0	0	0	28 Aswan	0	0	0
14 Qalyubia	0	0	0	31 Red Sea	29,409	0	997
15 Kafr el Sheikh	0	0	0	32 New Valley	0	0	0
16 Gharbia	0	1,400	0	33 Matrouh	4,248	0	801
17 Minufia	0	0	0	34 North Sinai	0	0	267
18 Beheira	0	0	0	35 South Sinai	10,295	168	0
19 Ismailiya	0	0	0				
21 Giza	0	0	0	TOTAL	43,952	23,156	6,110

Note: Crude Oil production includes foreign partners' shares

Exploration, extraction and refinement of crude oil is done by the authorities and companies of the Ministry of Petroleum, at times in association or under agreements with foreign companies or partners.

Basically there are four regions where crude oil is extracted in Egypt, namely;

Region	Production(1000t) in 1990	Share(%)
Sinai	10,295	23
Eastern Desert	1,695	4
Suez Gulf	27,714	63
Western Desert	4,248	10

The Ministry of Petroleum, through its companies, operates eight refineries, in Cairo (1 plant), Gharbia (1), Suez (2), Alexandria (2), Assyut (1) and a small refinery in South

Sinai (1). Production distribution of the petroleum products among these refineries was based upon the amount of crude oil refined by each.

The main Natural Gas producing fields are Abu Madi in Dakahlia governorate (producing 42% of the total), followed by Abu Qir Naf offshore fields of Alexandria governorate (22%). Ras Shukeir field in Red Sea governorate produced 18%.

3.2.2 Surplus and Deficit Analysis

The 1990 production and consumption figures for some individual commodities; crude oil and petroleum products of gasoline, mazout, gas oil/diesel, kerosene, and natural gas for 1990, are produced in Table 3-2-2.

Table 3-2-2 Surplus/Deficit Analysis (1)
2. Crude Oil (Production, Foreign Trade, Consumption) in 1990

(1000 Tons)

Governorate	SUPPLY			DEMAND				Surplus/ Deficit (+/-)
	Production	Import	TOTAL	Consumption	Foreign Partner	Export	TOTAL	
01 Cairo	0	0	0	6,512			6,512	-6,512
02 Alexandria	0	0	0	8,389			8,389	-8,389
03 Port Said	0	0	0	0			0	0
04 Suez	0	0	0	6,234			6,234	-6,234
11 Damietta	0	0	0	0			0	0
12 Dakahlia	0	0	0	0			0	0
13 Sharkia	0	0	0	0			0	0
14 Qalyubia	0	0	0	0			0	0
15 Kafr el Sheikh	0	0	0	0			0	0
16 Gharbia	0	0	0	1,472			1,472	-1,472
17 Minufia	0	0	0	0			0	0
18 Beheira	0	0	0	0			0	0
19 Ismailiya	0	0	0	0			0	0
21 Giza	0	0	0	0			0	0
22 Beni Suef	0	0	0	0			0	0
23 Fayoum	0	0	0	0			0	0
24 Minya	0	0	0	0			0	0
25 Asyut	0	0	0	1,556			1,556	-1,556
26 Sohag	0	0	0	0			0	0
27 Qena	0	0	0	0			0	0
28 Aswan	0	0	0	0			0	0
31 Red Sea	29,409	0	29,409	0			0	29,409
32 New Valley	0	0	0	0			0	0
33 Matrouh	4,248	0	4,248	0			0	4,248
34 North Sinai	0	0	0	0			0	0
35 South Sinai	10,295	0	10,295	176			176	10,119
TOTAL	43,952	0	43,952	24,339	14,958	4,655	43,952	19,613

Note: (1) Production includes share of partners, obtained from EGPC
(2) Export obtained from EGPC data, no data available to Study Team on distribution by governorate
(3) Foreign Partners' share obtained from subtracting consumption and export from the total production. No data available on governorate distribution
(4) Consumption obtained from EGPC annual report

Table 3-2-2 Surplus/Deficit Analysis (2)

4. Gasoline (Production, Foreign Trade, Consumption) in 1990

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/ Deficit
	Prod.	Import	TOTAL	Consumpt	Export	TOTAL	(+/-)
01 Cairo	581	0	581	664	0	664	-83
02 Alexandria	749	0	749	232	0	232	517
03 Port Said	0	0	0	35	0	35	-35
04 Suez	556	0	556	43	0	43	513
11 Damietta	0	0	0	32	0	32	-32
12 Dakahlia	0	0	0	89	0	89	-89
13 Sharkia	0	0	0	96	0	96	-96
14 Qalyubia	0	0	0	80	0	80	-80
15 Kafr el Sheikh	0	0	0	28	0	28	-28
16 Gharbia	131	0	131	74	0	74	57
17 Minufia	0	0	0	42	0	42	-42
18 Beheira	0	0	0	72	0	72	-72
19 Ismailiya	0	0	0	39	0	39	-39
21 Giza	0	0	0	275	0	275	-275
22 Beni Suef	0	0	0	29	0	29	-29
23 Fayoum	0	0	0	30	0	30	-30
24 Minya	0	0	0	47	0	47	-47
25 Asyut	139	0	139	39	0	39	100
26 Sohag	0	0	0	35	0	35	-35
27 Qena	0	0	0	59	0	59	-59
28 Aswan	0	0	0	37	0	37	-37
31 Red Sea	0	0	0	14	0	14	-14
32 New Valley	0	0	0	4	0	4	-4
33 Matrouh	0	0	0	54	0	54	-54
34 North Sinai	0	0	0	12	0	12	-12
35 South Sinai	16	0	16	11	0	11	5
TOTAL	2172	0	2172	2172	0	2172	0

Note:
(1) Production from EGPC Annual Report
(2) Import and Export from EGPC Annual Report
(3) Consumption distribution from EGPC interview

Table 3-2-2 Surplus/Deficit Analysis (3-1)

5. Fuel Oil (Production, Foreign Trade, Consumption) in 1990

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/ Deficit
	Prod.	Import	TOTAL	Consump.	Export	TOTAL	(+/-)
01 Cairo	3027	0	3027	3312	0	3312	-285
02 Alexandria	3899	0	3899	1270	415	1685	2214
03 Port Said	0	0	0	9	544	554	-554
04 Suez	2897	0	2897	346	216	562	2335
11 Damietta	0	0	0	21	0	21	-21
12 Dakahlia	0	0	0	286	0	286	-286
13 Sharkia	0	0	0	132	0	132	-132
14 Qalyubia	0	0	0	211	0	211	-211
15 Kafr el Sheikh	0	0	0	124	0	124	-124
16 Gharbia	684	0	684	226	0	226	458
17 Minufia	0	0	0	40	0	40	-40
18 Beheira	0	0	0	1249	0	1249	-1249
19 Ismailiya	0	0	0	385	0	385	-385
21 Giza	0	0	0	763	0	763	-763
22 Beni Suef	0	0	0	81	0	81	-81
23 Fayoum	0	0	0	53	0	53	-53
24 Minya	0	0	0	146	0	146	-146
25 Asyut	723	0	723	505	0	505	218
26 Sohag	0	0	0	130	0	130	-130
27 Qena	0	0	0	116	0	116	-116

Table 3-2-2 Surplus/Deficit Analysis (3-2)

5. Fuel Oil (Production, Foreign Trade, Consumption) in 1990

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/ Deficit
	Prod.	Import	TOTAL	Consump.	Export	TOTAL	(+/-)
28 Aswan	0	0	0	73	0	73	-73
31 Red Sea	0	0	0	370	0	370	-370
32 New Valley	0	0	0	0	0	0	0
33 Matrouh	0	0	0	280	0	280	-280
34 North Sinai	0	0	0	0	0	0	0
35 South Sinai	82	0	82	8	0	8	74
TOTAL	11312	0	11312	10136	1176	11312	0

Note:
(1) Production obtained from EGPC annual report
(2) Foreign trade obtained from CAPMAS
(3) Consumption obtained from EGPC interview

Table 3-2-2 Surplus/Deficit Analysis (4)

6. Gas Oil/Diesel (Production, Foreign Trade, Consumption) in 1990

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/ Deficit
	Producti	Import	TOTAL	Consumpt	Export	TOTAL	(+/-)
01 Cairo	1132	0	1132	679	0	679	453
02 Alexandria	1458	329	1787	288	4	292	1495
03 Port Said	0	0	0	58	72	130	-130
04 Suez	1083	0	1083	144	1	145	938
11 Damietta	0	0	0	91	0	91	-91
12 Dakahlia	0	0	0	254	0	254	-254
13 Sharkia	0	0	0	283	0	283	-283
14 Qalyubia	0	0	0	159	0	159	-159
15 Kafr el Sheikh	0	0	0	128	0	128	-128
16 Gharbia	256	0	256	203	0	203	53
17 Minufia	0	0	0	119	0	119	-119
18 Beheira	0	0	0	355	0	355	-355
19 Ismailiya	0	0	0	107	0	107	-107
21 Giza	0	0	0	276	0	276	-276
22 Beni Suef	0	0	0	85	0	85	-85
23 Fayoum	0	0	0	62	0	62	-62
24 Minya	0	0	0	130	0	130	-130
25 Asyut	270	0	270	110	0	110	160
26 Sohag	0	0	0	107	0	107	-107
27 Qena	0	0	0	178	0	178	-178
28 Aswan	0	0	0	81	0	81	-81
31 Red Sea	0	0	0	163	0	163	-163
32 New Valley	0	0	0	42	0	42	-42
33 Matrouh	0	0	0	207	0	207	-207
34 North Sinai	0	0	0	83	0	83	-83
35 South Sinai	31	0	31	90	0	90	-59
TOTAL	4230	329	4559	4482	77	4559	0

Note:
(1) Production obtained from EGPC Annual Report, and consumption from EGPC interview

Table 3-2-2 Surplus/Deficit Analysis (5)

7. Kerosene (Production, Foreign Trade, Consumption) in 1990

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/ Deficit
	Producti	Import	TOTAL	Consumpt	Export	TOTAL	(+/-)
01 Cairo	624	0	624	290	0	290	334
02 Alexandria	805	0	805	84	0	84	721
03 Port Said	0	0	0	13	0	13	-13
04 Suez	598	0	598	12	0	12	586
11 Damietta	0	0	0	46	0	46	-46
12 Dakahlia	0	0	0	168	0	168	-168
13 Sharkia	0	0	0	181	0	181	-181
14 Qalyubia	0	0	0	98	0	98	-98
15 Kafr el Sheikh	0	0	0	93	0	93	-93
16 Gharbia	141	0	141	140	0	140	1
17 Minufia	0	0	0	115	0	115	-115
18 Beheira	0	0	0	181	0	181	-181
19 Ismailiya	0	0	0	27	0	27	-27
21 Giza	0	0	0	129	0	129	-129
22 Beni Suef	0	0	0	80	0	80	-80
23 Fayoum	0	0	0	81	0	81	-81
24 Minya	0	0	0	150	0	150	-150
25 Asyut	149	0	149	112	0	112	37
26 Sohag	0	0	0	134	0	134	-134
27 Qena	0	0	0	111	0	111	-111
28 Aswan	0	0	0	38	0	38	-38
31 Red Sea	0	0	0	4	0	4	-4
32 New Valley	0	0	0	4	0	4	-4
33 Matrouh	0	0	0	32	0	32	-32
34 North Sinai	0	0	0	9	0	9	-9
35 South Sinai	17	0	17	2	0	2	15
TOTAL	2334	0	2334	2334	0	2334	0

Note:
Production, export and import from EGPC annual report, consumption from EGPC interview.

Table 3-2-2 Surplus/Deficit Analysis (6-1)

9. Natural Gas (Production, Foreign Trade, Consumption) in 1990

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/ Deficit
	Producti	Import	TOTAL	Consumpt	Export	TOTAL	(+/-)
01 Cairo	0	0	0	1275	0	1275	-1275
02 Alexandria	1417	0	1417	931	0	931	486
03 Port Said	0	0	0	14	0	14	-14
04 Suez	0	0	0	684	0	684	-684
11 Damietta	0	0	0	482	0	482	-482
12 Dakahlia	2628	0	2628	951	0	951	1677
13 Sharkia	0	0	0	0	0	0	0
14 Qalyubia	0	0	0	595	0	595	-595
15 Kafr el Sheikh	0	0	0	0	0	0	0
16 Gharbia	0	0	0	140	0	140	-140
17 Minufia	0	0	0	257	0	257	-257
18 Beheira	0	0	0	397	0	397	-397
19 Ismailiya	0	0	0	276	0	276	-276
21 Giza	0	0	0	34	0	34	-34
22 Beni Suef	0	0	0	0	0	0	0
23 Fayoum	0	0	0	0	0	0	0
24 Minya	0	0	0	0	0	0	0
25 Asyut	0	0	0	7	0	7	-7
26 Sohag	0	0	0	0	0	0	0

Table 3-2-2 Surplus/Deficit Analysis (6-2)

9. Natural Gas (Production, Foreign Trade, Consumption) in 1990

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/ Deficit
	Producti	Import	TOTAL	Consumpt	Export	TOTAL	(+/-)
27 Qena	0	0	0	0	0	0	0
28 Aswan	0	0	0	0	0	0	0
31 Red Sea	997	0	997	67	0	67	930
32 New Valley	0	0	0	0	0	0	0
33 Matrouh	801	0	801	0	0	0	801
34 North Sinai	267	0	267	0	0	0	267
35 South Sinai	0	0	0	0	0	0	0
TOTAL	6110	0	6110	6110	0	6110	0

Note:
All information obtained from EGPC Annual Report

Although production of crude oil was in the order of 43.9 million tons in 1990, the amount consumed locally was 24.4 million tons. Egypt exported 4.7 million tons, and the remainder of 14.9 million tons was the share of foreign partners. Crude oil was consumed at eight refineries in Cairo, Alexandria, Suez, Gharbia, Asuyt and South Sinai.

Total production of gasoline and kerosene equaled local consumption, and there were neither exports nor imports of both products. Over 10% of the mazout (fuel oil) locally produced was exported, while in the case of gas oil (diesel oil) over 7% of the consumed amount was imported. Consumption of natural gas by the various sectors in 1990 was as follows;

Consumption Sector	Share(%)
Electric Power Generation Sector	60
Fertilizers Manufacturing Sector	15
Metal Production Sector	11
Investment Companies	1
Construction Materials Sector	8
Petroleum and Petrochemicals Sector	4
Gas Supply to Houses	1

Gas supply network at present is limited to areas of Cairo and Giza governorates only.

3.2.3 Transport of Crude Oil and Petroleum Products

Table 3-2-3 shows the transport modes used for crude oil and petroleum products in 1990. Over half (52%) of the total products were transported by pipelines, followed by road transport (21%) and coastal transport (25%). Shares of railroad and waterway are very low at 2% and 1% respective-

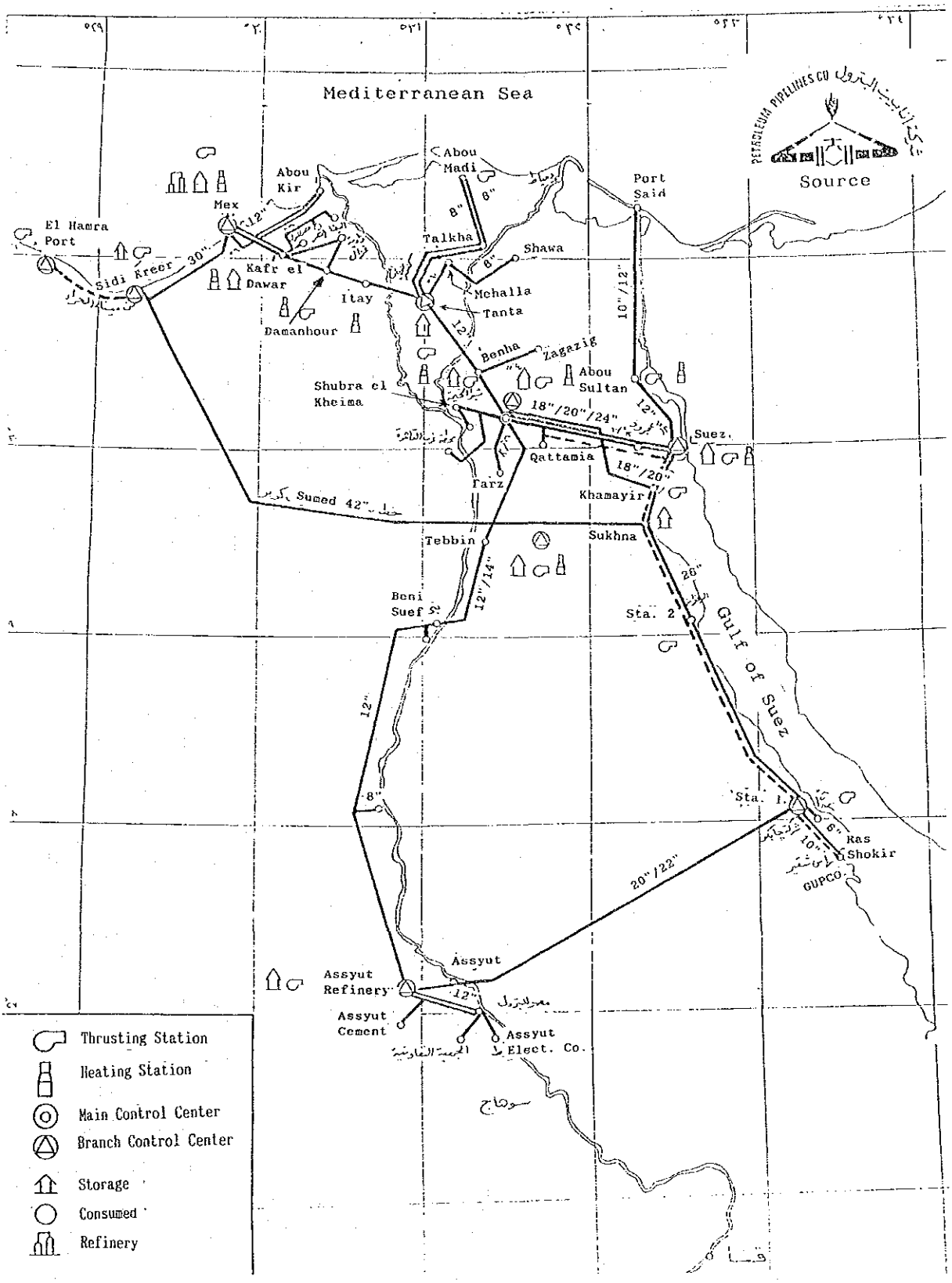

Fig. 3-2-1 Crude Oil and Petroleum Prducts Pipeline Network

ly. Figure 3-2-1 shows the pipeline network used in the transport of crude oil and petroleum products.

Table 3-2-3 Transport Modes of Crude Oil & Petroleum Products in 1990

(unit: 1000 t)

Item	Coastal		Pipeline		Truck		Railroad		Waterway	
	Amount	(%)	Amount	(%)	Amount	(%)	Amount	(%)	Amount	(%)
1. Crude Oil	14117	48.1	15215	51.9	0	0.0	0	0.0	0	0.0
2. Petroleum Products										
Gasoline	0	0.0	880	26.4	2344	70.3	112	3.4	0	0.0
Turbine	0	0.0	137	79.7	0	0.0	35	20.3	0	0.0
Kerosene	0	0.0	2854	52.8	2217	41.0	135	2.5	197	3.6
Diesel/Gas Oil	0	0.0	4466	51.1	3886	44.4	163	1.9	231	2.6
Fuel Oil	0	0.0	6921	63.4	3439	31.5	431	3.9	131	1.2
Sub-Total	0	0.0	15258	53.4	11886	41.6	876	3.1	559	2.0
3. Butagas	277	35.0	279	35.2	236	29.8	0	0.0	0	0.0
Total	14394	24.5	30752	52.4	12122	20.6	876	1.5	559	1.0

Source: EGPC Annual Report, 1990

The total length of the network was approximately 2,430Km in 1988, and diameters varied from 4" (directly connected to consumers) to 42" (the Sumed line). In 1990 the largest volume for domestic consumption of 8.9 million tons was transported between Shukir and Hafayer, followed by 7.6 million tons along the Hafayer-Mostorod line.

The company survey results indicated that the amount of vehicles (pick up, truck, trailer) belonging to the Ministry of Petroleum's various companies was about 2,000. In 1988 the corresponding figure was 1,210. A rough estimate, based on the load capacity distribution of the fleet in 1988, shows the Ministry having a total fleet capacity of 15,500 tons. In 1988 the private sector operated just over 50% of the total fleet (CAPMAS statistics).

3.3 Construction Materials Commodities

3.3.1 Production

Production distribution of the two sub-groups under this commodity group is shown in Table 3-3-1.

Eighty-one percent of cement sub-group production was located in the four urban governorates. Over 40% of other construction materials sub-group production originated from the urban governorates, with Cairo alone responsible for roughly one-third of the total.

Table 3-3-1 Production Distribution of Construction Materials Sub-Groups by Governorate in 1990

(unit: 1000 t)

Governorate	(4) Cement	(5) Other Const. Materials	Governorate	(4) Cement	(5) Other Const. Materials
01 Cairo	27,590	47,316	22 Beni Suef	0	2,885
02 Alexandria	6,803	14,785	23 Fayoum	0	3,166
03 Port Said	0	1,124	24 Minya	0	2,732
04 Suez	1,976	1,685	25 Asyut	4,607	3,626
11 Damietta	0	2,298	26 Sohag	0	7,175
12 Dakahlia	0	8,580	27 Qena	0	10,137
13 Sharkia	0	6,384	28 Aswan	600	2,068
14 Qalyubia	0	8,937	31 Red Sea	0	536
15 Kafr el Sheikh	0	2,502	32 New Valley	0	383
16 Gharbia	0	7,048	33 Matrouh	3,350	741
17 Minufia	0	3,754	34 North Sinai	0	638
18 Beheira	0	5,388	35 South Sinai	0	332
19 Ismailiya	0	2,809			
21 Giza	0	8,043	TOTAL	44,926	155,073

3.3.2 Surplus and Deficit Analysis

Consumption of cement produced by public sector companies was obtained from the responsible holding company. The private sector produced 10% of total production in 1990, and that amount was distributed among the governorates in the same ratios as that produced by the public sector. Consumption of gravel/sand/earth and bricks was distributed in the same ratios as that of cement. On the other hand, consumption distribution of limestone was made using data from the company survey.

The surplus and deficit of construction commodities are shown in Table 3-3-2.

Table 3-3-2 Surplus/Deficit for Construction Materials Commodities (1)

12. Cement (Production, Foreign Trade, Consumption) in 1990

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/Deficit
	Prod.	Import	TOTAL	Consump.	Export	TOTAL	(+/-)
01 Cairo	9,990	0	9,990	3,040	0	3,040	6,950
02 Alexandria	3,453	7	3,461	1,741	0	1,741	1,720
03 Port Said	0	86	86	243	0	243	-157
04 Suez	976	102	1,078	161	6	168	910
11 Damietta	0	49	49	396	0	396	-347
12 Dakahlia	0	0	0	1,502	0	1,502	-1,502
13 Sharkia	0	0	0	519	0	519	-519
14 Qalyubia	0	0	0	1,257	0	1,257	-1,257
15 Kafr el Sheikh	0	0	0	246	0	246	-246
16 Gharbia	0	0	0	391	0	391	-391
17 Minufia	0	0	0	248	0	248	-248
18 Beheira	0	0	0	1,380	0	1,380	-1,380
19 Ismailiya	0	0	0	443	0	443	-443
21 Giza	0	0	0	1,962	0	1,962	-1,962
22 Beni Suef	0	0	0	216	0	216	-216
23 Fayoum	0	0	0	326	0	326	-326
24 Minya	0	0	0	110	0	110	-110
25 Asyut	1,707	0	1,707	327	0	327	1,380
26 Sohag	0	0	0	446	0	446	-446
27 Qena	0	0	0	539	0	539	-539
28 Aswan	0	0	0	198	0	198	-198
31 Red Sea	0	0	0	44	1	46	-46
32 New Valley	0	0	0	58	0	58	-58
33 Matrouh	0	0	0	339	0	339	-339
34 North Sinai	0	0	0	230	0	230	-230
35 South Sinai	0	0	0	0	0	0	0
TOTAL	16,126	244	16,370	16,363	7	16,370	0

Notes
(1) Production: Amount from Ministry of Reconstruction annual report. Distribution by governorate from Cement Sales Office. Production in Suez by private sector and amount obtained from company survey.
(2) Export/Import: CAPMAS
(3) Consumption: Distribution from Cement Sales Office. Amount from office adjusted to take into account difference between two figures of production from the Ministry of Reconstruction annual report and Cement Sales Office, and also production of private sector.

Table 3-3-2 Surplus/Deficit for Construction Materials Commodities (2-1)

11. Lime Stone (Production, Foreign Trade, Consumption) in 1990

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/Deficit
	Producti	Import	TOTAL	Consumpt	Export	TOTAL	(+/-)
01 Cairo	17,600	0	17,600	15,400	0	15,400	2,200
02 Alexandria	3,350	0	3,350	6,700	0	6,700	-3,350
03 Port Said	0	0	0	0	0	0	0
04 Suez	1,000	0	1,000	2,110	0	2,110	-1,110
11 Damietta	0	0	0	0	0	0	0
12 Dakahlia	0	0	0	1,090	0	1,090	-1,090
13 Sharkia	0	0	0	0	0	0	0
14 Qalyubia	0	0	0	0	0	0	0
15 Kafr el Sheikh	0	0	0	0	0	0	0
16 Gharbia	0	0	0	0	0	0	0
17 Minufia	0	0	0	0	0	0	0
18 Beheira	0	0	0	0	0	0	0
19 Ismailiya	0	0	0	0	0	0	0

Table 3-3-2 Surplus/Deficit for Construction Materials Commodities (2-2)

11. Lime Stone (Production, Foreign Trade, Consumption) in 1990

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/ Deficit
	Producti	Import	TOTAL	Consumpt	Export	TOTAL	(+/-)
21 Giza	0	0	0	0	0	0	0
22 Beni Suef	0	0	0	0	0	0	0
23 Fayoum	0	0	0	0	0	0	0
24 Minya	0	0	0	600	0	600	-600
25 Asyut	2,900	0	2,900	2,300	0	2,300	600
26 Sohag	0	0	0	0	0	0	0
27 Qena	0	0	0	0	0	0	0
28 Aswan	600	0	600	600	0	600	0
31 Red Sea	0	0	0	0	0	0	0
32 New Valley	0	0	0	0	0	0	0
33 Matrouh	3,350	0	3,350	0	0	0	3,350
34 North Sinai	0	0	0	0	0	0	0
35 South Sinai	0	0	0	0	0	0	0
TOTAL	28,800	0	28,800	28,800	0	28,800	0

Notes: (1) Production: Amount from CAPMAS Annual Year Book. Production mainly from quarries around Cairo in Tebbin and Qatamia, in Alexandria and Matrouh, Suez, Minya and Aswan. Company survey results showed that all cement companies received limestone from quarries beside the factories. This and the quarries locations, from maps, were taken into consideration and the production distribution was estimated.

(2) Consumption: Lime stone is a raw material used in the cement industry, building materials industry, and chemicals industries. The consumption distribution was estimated using data obtained from company survey.

Table 3-3-2 Surplus/Deficit for Construction Materials (3)

14/15. Gravel/Sand/Earth and Bricks (Production, Foreign Trade, Consumption) in 1990

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/ Deficit
	Prod.	Import	TOTAL	Consump.	Export	TOTAL	(+/-)
01 Cairo	47,174	0	47,174	39,311	0	39,311	7,863
02 Alexandria	14,744	12	14,756	17,973	2	17,975	-3,219
03 Port Said	1,123	1	1,124	1,158	0	1,158	-34
04 Suez	1,658	0	1,658	4,020	1	4,021	-2,362
11 Damietta	2,297	0	2,297	1,726	0	1,726	571
12 Dakahlia	8,575	0	8,575	9,254	0	9,254	-679
13 Sharkia	6,378	0	6,378	6,140	0	6,140	238
14 Qalyubia	8,918	0	8,918	6,105	0	6,105	2,812
15 Kafr el Sheikh	2,502	0	2,502	2,978	0	2,978	-476
16 Gharbia	7,047	0	7,047	5,238	0	5,238	1,809
17 Minufia	3,752	0	3,752	4,398	0	4,398	-645
18 Beheira	5,388	0	5,388	7,794	0	7,794	-2,406
19 Ismailiya	1,541	0	1,541	1,731	0	1,731	-190
21 Giza	8,040	0	8,040	10,229	0	10,229	-2,189
22 Beni Suef	2,872	0	2,872	2,971	0	2,971	-99
23 Fayoum	3,157	0	3,157	3,173	0	3,173	-16
24 Minya	2,716	0	2,716	5,761	0	5,761	-3,045
25 Asyut	3,610	0	3,610	7,824	0	7,824	-4,215
26 Sohag	7,159	0	7,159	5,690	0	5,690	1,468
27 Qena	10,114	0	10,114	4,772	0	4,772	5,343
28 Aswan	2,052	0	2,052	2,781	0	2,781	-729
31 Red Sea	530	0	530	244	0	244	285
32 New Valley	376	0	376	298	0	298	78
33 Matrouh	398	0	398	797	0	797	-399
34 North Sinai	638	0	638	609	0	609	30
35 South Sinai	332	0	332	125	0	125	207
TOTAL	153,092	13	153,105	153,101	3	153,104	1

Note: (1) Production: Amount from CAPMAS Annual Year Book (14) and Company Survey (15)

(2) Export/Import: CAPMAS

(3) Consumption: Commodity (14) is basically used in construction material industry & construction sites. Sand consumed in construction material production and amounts and locations of cement consumption were used to distribute the consumption. Bricks (15) are used in construction sites and distribution was based on amount of cement used in each governorate.

3.4 Mining Commodities

3.4.1 Production

Although the Ministry of Petroleum and Mineral Resources is responsible for research and discovery of mining locations, the extraction of the minerals and development of the fields is done by various agencies, formerly of the Ministry of Industry, and presently under Holding Companies. The companies belonging to these agencies have all been covered under the company survey. Table 3-4-1 shows the production distribution of the four sub-groups under this commodity group.

Phosphate is extracted from the governorates of Aswan and Red Sea. The abundant phosphate fields in the New Valley have not yet been developed. Iron Ore is located at the south-west tip of Giza governorate, and also at Aswan. Coal is imported from abroad, while coke is produced in Cairo.

Table 3-4-1 Production Distribution of Minerals Sub-group by Governorate in 1990

(1000 Tons)

Governorate	(6) Phos-phate	(7) Iron Ore	(8) Coal/ Coke	(9) Other Minerals	Governorate	(6) Phos-phate	(7) Iron Ore	(8) Coal/ Coke	(9) Other Minerals
01 Cairo	0	0	1,131	3	22 Beni Suef	0	0	0	0
02 Alexandria	0	0	0	852	23 Fayoum	0	0	0	972
03 Port Said	0	0	0	195	24 Minya	0	0	0	52
04 Suez	0	0	0	520	25 Asyut	0	0	0	0
11 Damietta	0	0	0	244	26 Sohag	0	0	0	0
12 Dakahlia	0	0	0	1	27 Qena	0	0	0	0
13 Sharkia	0	0	0	0	28 Aswan	529	267	0	6,657
14 Qalyubia	0	0	0	0	31 Red Sea	418	0	0	73
15 Kafr el Sheikh	0	0	0	0	32 New Valley	0	0	0	0
16 Gharbia	0	0	0	2	33 Matrouh	0	0	0	10
17 Minufia	0	0	0	0	34 North Sinai	0	0	0	13
18 Beheira	0	0	0	93	35 South Sinai	0	0	0	40
19 Ismailiya	0	0	0	3					
21 Giza	0	2,138	0	44	Total	3,988	4,255	4,255	10,941

3.4.2 Surplus/Deficit Analysis

The surplus and deficit analysis for six individual mining commodities are shown in Table 3-4-2. Phosphates are consumed by the fertilizer companies at the governorates of Qaluibiya, Gharbia and Asyut, and roughly one-third of the annual production is exported via the Red Sea port of Safaga. Cairo is the largest consumer of iron ore, followed by Alexandria. Coal imports entered through Alexandria, and were consumed in Cairo to produce coke, which was mainly consumed there as well. Salt is produced in the coastal governorates of Alexandria, Port Said, Suez, and Damyat.

Table 3-4-2 Surplus/Deficit Analysis (1)

19. Phosphate (Production, Foreign Trade, Consumption) in 1990

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/ Deficit
	Product.	Import	TOTAL	Consum.	Export	TOTAL	(+/-)
01 Cairo	0	0	0	0	0	0	0
02 Alexandria	0	0	0	0	0	0	0
03 Port Said	0	0	0	0	0	0	0
04 Suez	0	0	0	0	0	0	0
11 Damietta	0	0	0	0	0	0	0
12 Dakahlia	0	0	0	0	0	0	0
13 Sharkia	0	0	0	0	0	0	0
14 Qalyubia	0	0	0	257	0	257	-257
15 Kafr el Sheikh	0	0	0	0	0	0	0
16 Gharbia	0	0	0	207	0	207	-207
17 Minufia	0	0	0	0	0	0	0
18 Beheira	0	0	0	0	0	0	0
19 Ismailiya	0	0	0	0	0	0	0
21 Giza	0	0	0	0	0	0	0
22 Beni Suef	0	0	0	0	0	0	0
23 Fayoum	0	0	0	0	0	0	0
24 Minya	0	0	0	0	0	0	0
25 Asyut	0	0	0	175	0	175	-175
26 Sohag	0	0	0	0	0	0	0
27 Qena	0	0	0	0	0	0	0
28 Aswan	529	0	529	0	0	0	529
31 Red Sea	418	0	418	0	308	308	110
32 New Valley	0	0	0	0	0	0	0
33 Matrouh	0	0	0	0	0	0	0
34 North Sinai	0	0	0	0	0	0	0
35 South Sinai	0	0	0	0	0	0	0
TOTAL	947	0	947	639	308	947	0

Notes:
(1) Production: Amounts and distribution from the Holding Company.
(2) Export amount and distribution from the Holding Company.
(3) Consumption: Distributed according to company survey.

Table 3-4-2 Surplus/Deficit Analysis (2-1)

20. Iron Ore (Production, Foreign Trade, Consumption) in 1990

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/ Deficit
	Product.	Import	TOTAL	Consum.	Export	TOTAL	(+/-)
01 Cairo	0	0	0	2,300	0	2,300	-2300
02 Alexandria	0	1,210	1,210	1,048	37	1,085	125
03 Port Said	0	0	0	0	0	0	0
04 Suez	0	0	0	0	0	0	0
11 Damietta	0	0	0	0	0	0	0
12 Dakahlia	0	0	0	0	0	0	0
13 Sharkia	0	0	0	0	0	0	0
14 Qalyubia	0	0	0	200	0	200	-200
15 Kafr el Sheikh	0	0	0	0	0	0	0
16 Gharbia	0	0	0	0	0	0	0
17 Minufia	0	0	0	0	0	0	0
18 Beheira	0	0	0	0	0	0	0
19 Ismailiya	0	0	0	0	0	0	0
21 Giza	2,138	0	2,138	0	0	0	2138

Table 3-4-2 Surplus/Deficit Analysis (2-2)

20. Iron Ore (Production, Foreign Trade, Consumption) in 1990

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/ Deficit
	Product.	Import	TOTAL	Consum.	Export	TOTAL	(+/-)
22 Beni Suef	0	0	0	30	0	30	-30
23 Fayoum	0	0	0	0	0	0	0
24 Minya	0	0	0	0	0	0	0
25 Asyut	0	0	0	0	0	0	0
26 Sohag	0	0	0	0	0	0	0
27 Qena	0	0	0	0	0	0	0
28 Aswan	267	0	267	0	0	0	267
31 Red Sea	0	0	0	0	0	0	0
32 New Valley	0	0	0	0	0	0	0
33 Matrouh	0	0	0	0	0	0	0
34 North Sinai	0	0	0	0	0	0	0
35 South Sinai	0	0	0	0	0	0	0
TOTAL	2,405	1,210	3,615	3,578	37	3,615	0

Table 3-4-2 Surplus/Deficit Analysis (3)

21. Coal/Coke (Production, Foreign Trade, Consumption) in 1990

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/ Deficit
	Product.	Import	TOTAL	Consum.	Export	TOTAL	(+/-)
01 Cairo	1,131	0	1,131	2,508	0	2,508	-1376
02 Alexandria	0	1,518	1,518	28	113	141	1377
03 Port Said	0	0	0	0	0	0	0
04 Suez	0	0	0	0	0	0	0
11 Damietta	0	0	0	0	0	0	0
12 Dakahlia	0	0	0	0	0	0	0
13 Sharkia	0	0	0	0	0	0	0
14 Qalyubia	0	0	0	0	0	0	0
15 Kafr el Sheikh	0	0	0	0	0	0	0
16 Gharbia	0	0	0	0	0	0	0
17 Minufia	0	0	0	0	0	0	0
18 Beheira	0	0	0	0	0	0	0
19 Ismailiya	0	0	0	0	0	0	0
21 Giza	0	0	0	0	0	0	0
22 Beni Suef	0	0	0	0	0	0	0
23 Fayoum	0	0	0	0	0	0	0
24 Minya	0	0	0	0	0	0	0
25 Asyut	0	0	0	0	0	0	0
26 Sohag	0	0	0	0	0	0	0
27 Qena	0	0	0	0	0	0	0
28 Aswan	0	0	0	0	0	0	0
31 Red Sea	0	0	0	0	0	0	0
32 New Valley	0	0	0	0	0	0	0
33 Matrouh	0	0	0	0	0	0	0
34 North Sinai	0	0	0	0	0	0	0
35 South Sinai	0	0	0	0	0	0	0
TOTAL	1,131	1,518	2,649	2,536	113	2,649	0

Notes:
(1) Production amounts and distribution from the Company Survey results
(2) Export/Import data from CAPMAS
(3) Consumption amount and distribution from the Company Survey results

Table 3-4-2 Surplus/Deficit Analysis (4)
23. Salt (Production, Foreign Trade, Consumption) in 1990

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/Deficit
	Product.	Import	TOTAL	Consum.	Export	TOTAL	(+/-)
01 Cairo	0	0	0	121	0	121	-121
02 Alexandria	439	1	440	59	0	60	380
03 Port Said	195	0	195	8	134	142	53
04 Suez	244	0	244	7	0	7	237
11 Damietta	244	0	244	15	0	15	229
12 Dakahlia	1	0	1	72	0	72	-71
13 Sharkia	0	0	0	71	0	71	-71
14 Qalyubia	0	0	0	53	0	53	-53
15 Kafr el Sheikh	0	0	0	37	0	37	-37
16 Gharbia	2	0	2	58	0	58	-56
17 Minufia	0	0	0	46	0	46	-46
18 Beheira	0	0	0	67	0	67	-67
19 Ismailiya	0	0	0	12	0	12	-12
21 Giza	0	0	0	79	0	79	-79
22 Beni Suef	0	0	0	30	0	30	-30
23 Fayoum	0	0	0	32	0	32	-32
24 Minya	0	0	0	54	0	54	-54
25 Asyut	0	0	0	46	0	46	-46
26 Sohag	0	0	0	50	0	50	-50
27 Qena	0	0	0	46	0	46	-46
28 Aswan	0	0	0	16	0	16	-16
31 Red Sea	0	0	0	2	0	2	-2
32 New Valley	0	0	0	2	0	2	-2
33 Matrouh	0	0	0	3	0	3	-3
34 North Sinai	0	0	0	4	0	4	-4
35 South Sinai	0	0	0	1	0	1	-1
TOTAL	1,125	1	1,126	992	134	1,126	0

Notes:
(1) Production amount obtained from CAPMAS statistics and distributed based on GOFI data
(2) Export/Import data from CAPMAS
(3) Consumption based on population distribution

Table 3-4-2 Surplus/Deficit Analysis (5-1)
24. Sulfur/Pyrites (Production, Foreign Trade, Consumption) in 1990

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/Deficit
	Product.	Import	TOTAL	Consum.	Export	TOTAL	(+/-)
01 Cairo	0	0	0	16	0	16	-16
02 Alexandria	0	190	190	138	0	138	52
03 Port Said	0	0	0	0	0	0	0
04 Suez	0	0	0	0	0	0	0
11 Damietta	0	0	0	0	0	0	0
12 Dakahlia	0	0	0	0	0	0	0
13 Sharkia	0	0	0	0	0	0	0
14 Qalyubia	0	0	0	0	0	0	0
15 Kafr el Sheikh	0	0	0	0	0	0	0
16 Gharbia	0	0	0	31	0	31	-31
17 Minufia	0	0	0	0	0	0	0
18 Beheira	0	0	0	0	0	0	0
19 Ismailiya	0	0	0	0	0	0	0
21 Giza	0	0	0	2	0	2	-2
22 Beni Suef	0	0	0	0	0	0	0
23 Fayoum	0	0	0	0	0	0	0
24 Minya	0	0	0	0	0	0	0

Table 3-4-2 Surplus/Deficit Analysis (5-2)

24. Sulfur/Pyrites (Production, Foreign Trade, Consumption) in 1990

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/ Deficit
	Produc.	Import	TOTAL	Consum.	Export	TOTAL	(+/-)
25 Asyut	0	0	0	3	0	3	-3
26 Sohag	0	0	0	0	0	0	0
27 Qena	0	0	0	0	0	0	0
28 Aswan	0	0	0	1	0	1	-1
31 Red Sea	2	0	2	0	1	1	1
32 New Valley	0	0	0	0	0	0	0
33 Matrouh	0	0	0	0	0	0	0
34 North Sinai	0	0	0	0	0	0	0
35 South Sinai	0	0	0	0	0	0	0
TOTAL	2	190	192	191	1	192	0

Notes:
(1) Production amount estimated based on Third 5-Year Plan data
(2) Export/Import estimated based on Third 5-Year Plan data
(3) Consumption based on Company Survey Results

Table 3-4-2 Surplus/Deficit Analysis (6)

25. Kaolin/Clay (Production, Foreign Trade, Consumption) in 1990

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/ Deficit
	Produc.	Import	TOTAL	Consum.	Export	TOTAL	(+/-)
01 Cairo	0	0	0	6,462	0	6,462	-6462
02 Alexandria	0	7	7	1,229	0	1,229	-1222
03 Port Said	0	0	0	0	0	0	0
04 Suez	0	1	1	0	0	0	1
11 Damietta	0	0	0	0	0	0	0
12 Dakahlia	0	0	0	0	0	0	0
13 Sharkia	0	0	0	0	0	0	0
14 Qalyubia	0	0	0	0	0	0	0
15 Kafr el Sheikh	0	0	0	0	0	0	0
16 Gharbia	0	0	0	0	0	0	0
17 Minufia	0	0	0	0	0	0	0
18 Beheira	0	0	0	0	0	0	0
19 Ismailiya	0	0	0	0	0	0	0
21 Giza	0	0	0	0	0	0	0
22 Beni Suef	0	0	0	0	0	0	0
23 Fayoum	972	0	972	0	0	0	972
24 Minya	0	0	0	0	0	0	0
25 Asyut	0	0	0	0	0	0	0
26 Sohag	0	0	0	0	0	0	0
27 Qena	0	0	0	0	0	0	0
28 Aswan	6,641	0	6,641	0	0	0	6641
31 Red Sea	70	0	70	0	0	0	70
32 New Valley	0	0	0	0	0	0	0
33 Matrouh	0	0	0	0	0	0	0
34 North Sinai	0	0	0	0	0	0	0
35 South Sinai	0	0	0	0	0	0	0
TOTAL	7,683	8	7,691	7,691	0	7,691	0

Notes:
1) Production figures distributed based on ENTS II study pattern
2) Consumption distributed based on ENTS II pattern.

3.5 Agricultural Commodities

3.5.1 Production

Table 3-5-1 shows the production of eight sub-groups under this commodity group by governorate. The classification dividing the country's governorates into four regions for administrative and census purposes has been applied for studying production characteristics.

Table 3-5-1 Production Distribution of Agricultural Products Sub-Groups by Governorate in 1990

(1000 Tons)

Governorate	(10) Wheat	(11) Other Cereals	(12) Fruit/ Vegetabl	(13) Sugar Cane	(14) Fibre Crop	(15) Live-stock	(16) Animal Product	(17) O. Agr. Product
01 Cairo	0	2,120	27	2	0	0	89	0
02 Alexandria	31	178	711	7	1	16	174	3
03 Port Said	0	30	0	0	0	6	58	0
04 Suez	2	7	38	2	0	7	28	1
11 Damietta	43	225	206	9	10	35	23	9
12 Dakahlia	533	1,206	603	56	194	159	144	65
13 Sharkia	511	1,387	1,366	61	176	205	218	69
14 Qalyubia	88	848	1,257	79	22	73	87	14
15 Kafr el Sheikh	363	865	372	34	181	135	85	572
16 Gharbia	274	671	725	53	172	139	56	56
17 Minufia	217	481	988	35	77	139	41	33
18 Beheira	394	1,218	2,404	44	242	246	137	69
19 Ismailiya	24	154	523	1	7	23	24	18
21 Giza	40	590	1,650	51	0	78	149	21
22 Beni Suef	226	559	672	22	68	103	34	55
23 Fayoum	235	315	1,138	14	48	103	38	49
24 Minya	338	6,654	612	1,220	103	148	36	203
25 Asyut	300	508	377	65	63	136	57	123
26 Sohag	303	1,176	306	678	65	171	76	46
27 Qena	262	261	656	6,240	0	131	48	33
28 Aswan	29	232	257	2,474	0	47	50	6
31 Red Sea	0	4	65	0	0	4	30	0
32 New Valley	19	9	76	0	0	13	3	3
33 Matrouh	11	2	137	0	0	28	9	1
34 North Sinai	27	23	114	0	0	10	6	2
35 South Sinai	0	0	5	0	0	5	0	0
Total	4,268	19,724	15,285	11,144	1,428	2,159	1,704	1,451

The four regions are as follows;

- Urban Governorates: (19.9% of 1990 total population) (Cairo, Alexandria, Port Said and Suez)
- Lower Egypt: (43.3% of 1990 total population) (Damietta, Dakahlia, Sharkia, Qalyubia, Kafr el Sheikh, Gharbia, Minufia, Beheira and Ismailiya)

- Upper Egypt: (35.7% of 1990 total population) (Giza, Beni Suef, Fayoum, Minya, Asyut, Sohag, Qena, Aswan)
- Frontier Governorates (1.1% of 1990 total population) (Red Sea, New Valley, Matrouh, North Sinai, South Sinai)

Table 3-5-2 shows the shares of each region and major producing governorates for the principle agricultural commodities which together account for over 80% of total agricultural production.

Table 3-5-2 Regional Share of Production

(unit: %)

Commodity	Region			Major Producing Governorates							
	Lower Egypt	Upper Egypt	Urban Govern.	Front. Govern.	1st.		2nd.		3rd.		
Wheat	57	41	1	1	Dakahlia	12	Sharkia	12	Beheira	9	
Rice	98				Dakahlia	30	Kafr.Shk.	21	Beheira	18	
Corn/Maize	57	42			Beheira	12	Minya	11	Minufia	10	
							Sharkia	11			
Mill Prod.	10	69	21		Minya	56	Cairo	19	Sohag	6	
Citrus/Orange	83	15			Beheira	20	Sharkia	18	Qaliubia	17	
Melon/W.Melon	50	37	8	5	Beheira	26	Beni Suef	15	Sharkia	11	
Potato	77	20			Beheira	29	Minufia	23	Giza	14	
Tomato	39	52	7	2	Fayoum	17	Giza	13	Beheira	11	
Sugar Cane	3	96	1		Qena	56	Aswan	22	Minya	11	
Raw Cotton	74	26			Beheira	17	Dakahlia	14	Kafr.Shk.	12	
Meat/Poultry	59	37	3	1	Sharkia	11	Beheira	11	Dakahlia	8	
Fish	60	14	15	11	Dakahlia	23	Kafr.Shk.	14	Aswan	10	
									Red Sea	10	

Wheat production was almost uniformly distributed in the governorates of Lower Egypt and Upper Egypt. Rice production was largely confined to Lower Egypt governorates. Corn/Maize, like wheat was almost evenly distributed in the governorates of Lower Egypt and Upper Egypt.

The Citrus/Orange amount produced was 36% of total fruit crops produced. Production was mainly in the Lower Egypt governorates. Amount of Melon/Water Melon crops produced was 23% of total fruit crop produced in 1990. Production was fairly distributed between the country' Lower and Upper Egypt regions.

Potato crop amount produced represented 20% of total vegetable crops produced in 1990. Tomato crop amount produced accounted for 50% of total vegetables produced that year. This appears to be the only agricultural crop that was cultivated in all the country's governorates.

Sugar Cane is basically produced in Upper Egypt. Approximately three quarters of Raw Cotton total production was in Lower Egypt region, with the remainder produced by Upper Egypt governorates.

Meat and Poultry products were produced throughout the country, and production was almost evenly distributed among the governorates of both regions. Fish industries were concentrated in the coastal governorates and in Aswan (Lake Nasser) in Upper Egypt.

3.5.2 Surplus and Deficit Analysis

To determine surplus or deficit of a certain commodity it is necessary to know the consumption. Unfortunately the Study Team could not find any consumption studies and therefore followed the consumption calculation methods applied in the CAPMAS publications. These publications merely distributed the local consumption of agricultural and some industrial commodities according to population. Urban or rural populations and incomes were not taken into consideration.

In the case of agricultural commodities the above described method was applied and demand by governorate was calculated. However for wheat, the company survey has shed some light on the needs of the milling industry by location, and that information was applied to distribute the wheat. The same has been done for rice.

Table 3-5-3 shows the surplus/deficit calculated for eight agricultural commodities. In the case of wheat the highest deficit appeared in Cairo, while the highest surplus was in the Red Sea Governorate, due to the large amount of imports coming through Safaga port. Both Cairo and Alexandria have sufficiency in milling products. Minya in Upper Egypt has the highest surplus and is probably supplying all the region as the other region's governorates are all showing deficits. For dairy products Alexandria appears to be a supplier for Delta and Cairo areas which are almost all having deficits.

Table 3-5-3 Surplus/Deficit Analysis (1-1)

27. Wheat (Production, Foreign Trade, Consumption) in 1990

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/ Deficit
	Prod.	Import	TOTAL	Consump.	Export	TOTAL	(+/-)
01 Cairo	0	0	0	1,575	0	1,575	-1575
02 Alexandria	31	1,492	1,524	605	0	605	918
03 Port Said	0	487	487	78	0	78	409
04 Suez	2	526	528	66	0	66	463
11 Damietta	43	1,251	1,293	140	0	140	1153
12 Dakahlia	533	0	533	662	0	662	-129
13 Sharkia	511	0	511	653	0	653	-142
14 Qalyubia	88	0	88	490	0	490	-402
15 Kafr el Sheikh	363	0	363	340	0	340	22

Table 3-5-3 Surplus/Deficit Analysis (1-2)

27. Wheat (Production, Foreign Trade, Consumption) in 1990

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/ Deficit
	Prod.	Import	TOTAL	Consump.	Export	TOTAL	(+/-)
16 Gharbia	274	0	274	539	0	539	-266
17 Minufia	217	0	217	423	0	423	-206
18 Beheira	394	0	394	621	0	621	-226
19 Ismailiya	24	0	24	106	0	106	-83
21 Giza	40	0	40	727	0	727	-686
22 Beni Suef	226	0	226	274	0	274	-48
23 Fayoum	235	0	235	296	0	296	-61
24 Minya	338	0	338	504	0	504	-166
25 Asyut	300	0	300	423	0	423	-124
26 Sohag	303	0	303	465	0	465	-162
27 Qena	262	0	262	430	0	430	-168
28 Aswan	29	0	29	175	0	175	-146
31 Red Sea	0	1,682	1,682	18	0	18	1664
32 New Valley	19	0	19	22	0	22	-2
33 Matrouh	11	0	11	31	0	31	-20
34 North Sinai	27	0	27	40	0	40	-13
35 South Sinai	0	0	0	6	0	6	-6
Total	4,268	5,439	9,707	9,707	0	9,707	0

Notes: (1) Production: Amount and distribution from Ministry of Agriculture data.
(2) Export/import figures obtained from CAPMAS.
(3) Consumption distribution based on results of company survey.

Table 3-5-3 Surplus/Deficit Analysis (2)

33. Mill Industry Products (Production, Foreign Trade, Consumption) in 1990

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/ Deficit
	Prod.	Import	TOTAL	Consump.	Export	TOTAL	(+/-)
01 Cairo	2,118	0	2,118	1,498	0	1,498	620
02 Alexandria	140	1,035	1,175	731	0	731	444
03 Port Said	26	82	108	104	1	105	3
04 Suez	0	7	7	88	0	88	-81
11 Damietta	17	116	133	186	0	186	-53
12 Dakahlia	52	0	52	881	0	881	-830
13 Sharkia	347	0	347	870	0	870	-523
14 Qalyubia	587	0	587	653	0	653	-66
15 Kafr el Sheikh	7	0	7	453	0	453	-446
16 Gharbia	18	0	18	719	0	719	-701
17 Minufia	10	0	10	563	0	563	-553
18 Beheira	36	0	36	827	0	827	-791
19 Ismailiya	56	0	56	142	0	142	-86
21 Giza	293	0	293	968	0	968	-675
22 Beni Suef	245	0	245	365	0	365	-120
23 Fayoum	12	0	12	394	0	394	-382
24 Minya	6,106	0	6,106	671	0	671	5,435
25 Asyut	48	0	48	564	0	564	-516
26 Sohag	672	0	672	619	0	619	53
27 Qena	0	0	0	572	0	572	-572
28 Aswan	177	0	177	203	0	203	-26
31 Red Sea	4	0	4	24	0	24	-20
32 New Valley	0	0	0	29	0	29	-29
33 Matrouh	0	0	0	41	0	41	-41
34 North Sinai	7	0	7	44	0	44	-37
35 South Sinai	0	0	0	8	0	8	-8
Total	10,980	1,240	12,220	12,219	1	12,220	0

Notes: (1) Production: Amount from Central Bank of Egypt statistics. Distribution based on CAPMAS statistics for 1988.
(2) Export/Imports from CAPMAS.
(3) Consumption distributed according to population in 1990.

Table 3-5-3 Surplus/Deficit Analysis (3)

36. Citrus/Orange (Production, Foreign Trade, Consumption) in 1990

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/ Deficit
	Prod.	Import	TOTAL	Consump.	Export	TOTAL	(+/-)
01 Cairo	1	0	1	231	3	234	-233
02 Alexandria	15	0	15	113	79	192	-177
03 Port Said	0	0	0	16	56	72	-72
04 Suez	1	0	1	14	6	19	-19
11 Damietta	6	0	6	29	0	29	-22
12 Dakahlia	35	0	35	136	0	136	-101
13 Sharkia	363	0	363	134	0	134	228
14 Qalyubia	350	0	350	101	0	101	249
15 Kafr el Sheikh	32	0	32	70	0	70	-38
16 Gharbia	107	0	107	111	0	111	-4
17 Minufia	268	0	268	87	0	87	181
18 Beheira	406	0	406	128	0	128	278
19 Ismailiya	128	0	128	22	0	22	107
21 Giza	73	0	73	150	0	150	-77
22 Beni Suef	41	0	41	56	0	56	-15
23 Fayoum	60	0	60	61	0	61	-1
24 Minya	19	0	19	104	0	104	-84
25 Asyut	79	0	79	87	0	87	-9
26 Sohag	22	0	22	96	0	96	-73
27 Qena	15	0	15	88	0	88	-73
28 Aswan	6	0	6	31	0	31	-25
31 Red Sea	0	0	0	4	0	4	-4
32 New Valley	4	0	4	4	0	4	-1
33 Matrouh	0	0	0	6	0	6	-6
34 North Sinai	4	0	4	7	0	7	-3
35 South Sinai	0	0	0	1	6	7	-7
Total	2,037	0	2,037	1,887	150	2,037	0

Notes: (1) Production: Amount and distribution from Ministry of Agriculture data.
(2) Export/Import data from CAPMAS.
(3) Consumption distributed by population in 1990.

Table 3-5-3 Surplus/Deficit Analysis (4-1)

38. Melon/Water Melon (Production, Foreign Trade, Consumption) in 1990

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/ Deficit
	Prod.	Import	TOTAL	Consump.	Export	TOTAL	(+/-)
01 Cairo	0	0	0	157	1	158	-158
02 Alexandria	96	0	96	77	0	77	19
03 Port Said	0	0	0	11	0	11	-11
04 Suez	0	0	0	9	3	12	-12
11 Damietta	9	0	9	20	0	20	-11
12 Dakahlia	68	0	68	92	0	92	-24
13 Sharkia	142	0	142	91	0	91	50
14 Qalyubia	0	0	0	68	0	68	-68
15 Kafr el Sheikh	55	0	55	48	0	48	8
16 Gharbia	0	0	0	75	0	75	-75
17 Minufia	4	0	4	59	0	59	-55
18 Beheira	338	0	338	87	0	87	252
19 Ismailiya	29	0	29	15	0	15	14
21 Giza	18	0	18	102	0	102	-83
22 Beni Suef	189	0	189	38	0	38	151
23 Fayoum	62	0	62	41	0	41	21
24 Minya	49	0	49	70	0	70	-21
25 Asyut	11	0	11	59	0	59	-48
26 Sohag	33	0	33	65	0	65	-32

Table 3-5-3 Surplus/Deficit Analysis (4-2)
38. Melon/Water Melon (Production, Foreign Trade, Consumption) in 1990

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/Deficit
	Prod.	Import	TOTAL	Consump.	Export	TOTAL	(+/-)
27 Qena	57	0	57	60	0	60	-3
28 Aswan	62	0	62	21	0	21	41
31 Red Sea	21	0	21	3	0	3	19
32 New Valley	4	0	4	3	0	3	1
33 Matrouh	28	0	28	4	0	4	24
34 North Sinai	9	0	9	5	0	5	5
35 South Sinai	0	0	0	1	0	1	-1
Total	1,287	0	1,287	1,282	5	1,287	0

Notes: (1) Production: Amounts and distribution from Ministry of Agriculture data
(2) Exports/Imports from CAPMAS.
(3) Consumption distributed according to 1990 population.

Table 3-5-3 Surplus/Deficit Analysis (5)
40. Potatoes (Production, Foreign Trade, Consumption) in 1990

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/Deficit
	Prod.	Import	TOTAL	Consump.	Export	TOTAL	(+/-)
01 Cairo	0	0	0	187	1	188	-188
02 Alexandria	38	20	59	91	110	201	-142
03 Port Said	0	0	0	13	7	20	-20
04 Suez	0	5	5	11	15	26	-21
11 Damietta	12	0	12	23	0	23	-12
12 Dakahlia	76	0	76	110	0	110	-34
13 Sharkia	13	0	13	109	0	109	-95
14 Qalyubia	77	0	77	82	0	82	-5
15 Kafr el Sheikh	3	0	3	57	0	57	-53
16 Gharbia	212	0	212	90	0	90	122
17 Minufia	379	0	379	70	0	70	309
18 Beheira	480	0	480	103	0	103	376
19 Ismailiya	2	0	2	18	0	18	-16
21 Giza	225	0	225	121	0	121	104
22 Beni Suef	18	0	18	46	0	46	-28
23 Fayoum	0	0	0	49	0	49	-49
24 Minya	83	0	83	84	0	84	-0
25 Asyut	0	0	0	71	0	71	-70
26 Sohag	17	0	17	77	0	77	-61
27 Qena	0	0	0	72	0	72	-72
28 Aswan	0	0	0	25	0	25	-25
31 Red Sea	0	0	0	3	0	3	-3
32 New Valley	0	0	0	4	0	4	-4
33 Matrouh	0	0	0	5	0	5	-5
34 North Sinai	1	0	1	6	0	6	-5
35 South Sinai	0	0	0	1	3	4	-4
Total TOTAL	1,638	25	1,663	1,528	136	1,663	0

Notes: (1) Production: Amounts and distribution from Ministry of Agriculture data
(2) Exports/Imports from CAPMAS.
(3) Consumption distributed according to 1990 population.

Table 3-5-3 Surplus/Deficit Analysis (6)
41. Tomatoes (Production, Foreign Trade, Consumption) in 1990

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/ Deficit
	Prod.	Import	TOTAL	Consump.	Export	TOTAL	(+/-)
01 Cairo	5	0	5	516	1	517	-512
02 Alexandria	286	0	286	252	0	252	34
03 Port Said	0	0	0	36	0	36	-36
04 Suez	14	0	14	30	19	49	-35
11 Damietta	58	0	58	64	0	64	-7
12 Dakahlia	162	0	162	304	0	304	-142
13 Sharkia	320	0	320	300	0	300	20
14 Qalyubia	148	0	148	225	0	225	-77
15 Kafr el Sheikh	128	0	128	156	0	156	-29
16 Gharbia	104	0	104	248	0	248	-144
17 Minufia	53	0	53	194	0	194	-141
18 Beheira	478	0	478	285	0	285	193
19 Ismailiya	180	0	180	49	0	49	131
21 Giza	532	0	532	334	0	334	198
22 Beni Suef	220	0	220	126	0	126	94
23 Fayoum	706	0	706	136	0	136	570
24 Minya	144	0	144	231	0	231	-88
25 Asyut	84	0	84	195	0	195	-111
26 Sohag	86	0	86	214	0	214	-127
27 Qena	365	0	365	197	0	197	167
28 Aswan	54	0	54	70	0	70	-16
31 Red Sea	43	0	43	8	0	8	35
32 New Valley	4	0	4	10	0	10	-6
33 Matrouh	19	0	19	14	0	14	5
34 North Sinai	39	0	39	15	0	15	24
35 South Sinai	1	0	1	3	0	3	-2
Total	4,234	0	4,234	4,213	20	4,234	0

Notes: (1) Production: Amounts and distribution from Ministry of Agriculture data
(2) Exports/Imports from CAPMAS.
(3) Consumption distribution according to 1990 population.

Table 3-5-3 Surplus/Deficit Analysis (7-1)
52. Dairy Products (Production, Foreign Trade, Consumption) in 1990

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/ Deficit
	Prod.	Import	TOTAL	Consump.	Export	TOTAL	(+/-)
01 Cairo	3	3	6	42	0	42	-36
02 Alexandria	26	101	127	20	0	20	107
03 Port Said	0	12	12	3	1	3	8
04 Suez	0	0	0	2	2	5	-5
11 Damietta	2	0	2	5	0	5	-3
12 Dakahlia	4	0	4	25	0	25	-20
13 Sharkia	63	0	63	24	0	24	39
14 Qalyubia	13	0	13	18	0	18	-6
15 Kafr el Sheikh	0	0	0	13	0	13	-12
16 Gharbia	12	0	12	20	0	20	-8
17 Minufia	1	0	1	16	0	16	-15
18 Beheira	46	0	46	23	0	23	23
19 Ismailiya	8	0	8	4	0	4	4
21 Giza	45	0	45	27	0	27	18
22 Beni Suef	0	0	0	10	0	10	-10
23 Fayoum	0	0	0	11	0	11	-11
24 Minya	0	0	0	19	0	19	-19
25 Asyut	0	0	0	16	0	16	-16
26 Sohag	0	0	0	17	0	17	-17

Table 3-5-3 Surplus/Deficit Analysis (7-2)

52. Dairy Products (Production, Foreign Trade, Consumption) in 1990

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/ Deficit
	Prod.	Import	TOTAL	Consump.	Export	TOTAL	(+/-)
27 Qena	0	0	0	16	0	16	-16
28 Aswan	4	0	5	6	0	6	-1
31 Red Sea	0	0	0	1	0	1	-1
32 New Valley	0	0	0	1	0	1	-1
33 Matrouh	0	0	0	1	0	1	-1
34 North Sinai	0	0	0	1	0	1	-1
35 South Sinai	0	0	0	0	0	0	-0
Total	228	116	344	341	4	344	-0

Note: (1) Production: Amount from CAPMAS Annual Book, distribution based on GOFI data.
(2) Export/Import from CAPMAS.
(3) Consumption distributed by 1990 population.

Table 3-5-3 Surplus/Deficit Analysis (8)

53. Fish (Production, Foreign Trade, Consumption) in 1990

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/ Deficit
	Prod.	Import	TOTAL	Consump.	Export	TOTAL	(+/-)
01 Cairo	0	0	0	54	3	57	-57
02 Alexandria	21	76	97	26	0	26	70
03 Port Said	23	52	75	4	0	4	71
04 Suez	0	0	0	3	0	3	-3
11 Damietta	14	10	24	7	0	7	17
12 Dakahlia	71	0	71	32	0	32	39
13 Sharkia	14	0	14	31	0	31	-17
14 Qalyubia	0	0	0	24	0	24	-24
15 Kafr el Sheikh	42	0	42	16	0	16	25
16 Gharbia	6	0	6	26	0	26	-20
17 Minufia	8	0	8	20	0	20	-12
18 Beheira	28	0	28	30	0	30	-2
19 Ismailiya	2	0	2	5	0	5	-3
21 Giza	0	0	0	35	0	35	-35
22 Beni Suef	1	0	1	13	0	13	-12
23 Fayoum	2	0	2	14	0	14	-12
24 Minya	2	0	2	24	0	24	-22
25 Asyut	1	0	1	20	0	20	-19
26 Sohag	1	0	1	22	0	22	-21
27 Qena	5	0	5	21	0	21	-16
28 Aswan	30	0	30	7	0	7	23
31 Red Sea	30	0	30	1	0	1	29
32 New Valley	0	0	0	1	0	1	-1
33 Matrouh	1	0	1	1	0	1	-0
34 North Sinai	3	0	3	2	0	2	2
35 South Sinai	0	0	0	0	0	0	-0
Total	306	138	444	441	3	444	0

Note: (1) Production: Amount estimated from data of 1985 to 1988 on agriculture production from CAPMAS, and new Five Year Plan projections for the next five years. Distribution based on GOFI data.
(2) Export/Import from CAPMAS.
(3) Consumption distributed on governorates by 1990 population.

3.6 Industrial Commodities

3.6.1 Production

Table 3-6-1 shows the production of twelve industrial commodity sub-groups by governorate, and the results of that table are presented in Table 3-6-2.

In parallel with sugar cane production, majority of sugar products (refined sugar + molasses) was produced in Upper Egypt, with production concentrated in the Naga Hamadi - Qena - Aswan corridor.

Alexandria, Gharbia and Greater Cairo Region governorates are large industrial centers, while in Upper Egypt Qena, Aswan and Assyut have some industries. Under textiles sub-group, over half the cotton yarn/textiles is produced in Gharbia, and the wool yarn/textile industry is concentrated in Sharkia.

Table 3-6-1 Production Distribution of Industrial Sub-Groups by Governorate (1)

(unit: 1000 t)

Governorate	(18) Sugar	(19) Edible Oil/Fat	(20) Animal Feed	(21) Beverages	(22) Oth.Food Product	(23) Chemical Product
01 Cairo	36	2	26	12	15	39
02 Alexandria	22	44	157	136	50	76
03 Port Said	3	0	0	4	1	0
04 Suez	0	9	0	0	0	0
11 Damietta	1	0	139	0	0	0
12 Dakahlia	2	11	536	118	22	65
13 Sharkia	33	14	360	73	65	57
14 Qalyubia	33	10	204	13	19	32
15 Kafr el Sheikh	0	4	0	4	0	0
16 Gharbia	3	26	768	48	0	172
17 Minufia	0	0	25	0	80	0
18 Beheira	1	0	76	1	84	305
19 Ismailiya	1	0	0	21	0	24
21 Giza	94	6	145	93	20	3
22 Beni Suef	0	0	0	0	0	0
23 Fayoum	0	0	49	14	0	0
24 Minya	26	0	0	18	0	0
25 Asyut	0	0	8	7	13	0
26 Sohag	22	12	175	1	0	1
27 Qena	556	0	552	1	0	4
28 Aswan	233	0	0	34	0	0
31 Red Sea	0	0	0	1	0	0
32 New Valley	0	0	0	0	0	0
33 Matrouh	0	0	0	1	0	1
34 North Sinai	0	0	0	0	0	0
35 South Sinai	0	0	0	0	0	0
Total	1,068	138	3,219	599	370	779

Table 3-6-1 Production Distribution of Industrial Sub-Groups by Governorate (2)

(unit: 1000 t)

Governorate	(24) Metal Product	(25) Textile	(26) Manfact. Fertlz.	(27) Pulp/ Paper	(28) Lumber/ Timber	(29) Other Manfact.
01 Cairo	1,343	90	122	121	243	68
02 Alexandria	1,025	59	1,137	47	126	29
03 Port Said	8	0	0	0	8	0
04 Suez	0	11	1,524	0	25	0
11 Damietta	0	6	0	0	92	0
12 Dakahlia	0	9	66	0	67	0
13 Sharkia	83	1,140	0	9	33	0
14 Qalyubia	131	83	590	11	42	14
15 Kafr el Sheikh	0	5	0	0	17	0
16 Gharbia	0	950	848	9	50	0
17 Minufia	0	0	0	0	33	0
18 Beheira	0	18	0	2	42	0
19 Ismailiya	0	0	0	0	25	4
21 Giza	331	9	0	6	75	29
22 Beni Suef	0	0	0	0	8	0
23 Fayoum	0	0	0	1	8	0
24 Minya	0	0	0	0	17	0
25 Asyut	0	0	877	24	25	0
26 Sohag	0	5	0	0	17	0
27 Qena	207	2	0	0	25	0
28 Aswan	0	0	530	5	17	0
31 Red Sea	0	0	0	0	8	0
32 New Valley	0	0	0	0	8	0
33 Matrouh	0	0	0	0	8	0
34 North Sinai	0	0	0	0	8	0
35 South Sinai	0	0	0	0	4	0
Total	3,127	2,388	5,695	235	1,030	144

Table 3-6-2 Industrial Commodities Sub-Group Production by Region

(unit: %)

Commodity	Region				Major Producing Governorates					
	Lower Egypt	Upper Egypt	Urban Gov.	Front. Gov.	1st.		2nd.		3rd.	
18)Sugar	7	87	6	0	Qena	52	Aswan	22	Giza	9
19)Edible Oil/Fat	47	13	39	1	Alex.	32	Gharb	19	Shark	10
20)Animal Feed	65	29	6	0	Gharb	24	Qena	17	Dakah	17
21)Beverage	46	28	25	1	Alex.	23	Dakah	20	Giza	15
22)Oth.Food Prod.	73	9	18	0	Beher	23	Minuf	22	Shark	18
23)Chemical Prod.	84	1	15	0	Beher	39	Gharb	22	Alex.	10
24)Metal and Prod	7	17	24	0	Cairo	43	Alex.	33	Giza	11
25)Textiles	92	1	7	0	Shark	48	Gharb	40	Cairo	4
26)Mfc. Fertilizer	26	25	49	0	Suez	27	Alex.	20	Assyut	15
27)Pulp/Paper	13	16	71	0	Cairo	51	Alex.	20	Assyut	10
28)Other Manfct.	13	1	67	0	Cairo	47	Alex.	20	Giza	20

Alexandria and Cairo governorates accounted for 71% of pulp/paper and paper products produced. Although paper-manufacturing factories are concentrated in Alexandria, Cairo's share of production, at 51%, was higher than that of Alexandria (20%). This may be explained by the concentration of print shops, publishers and press in Cairo.

Cairo is the leading governorate in production of metal and

metal products and other manufactured goods with just less than half of the total production amount of each sub-group.

3.6.2 Surplus and Deficit Analysis

An attempt has been made to overcome the lack of available data on consumption of industrial commodities by tracing the destination of such goods through the company survey. As explained earlier, all the producing public companies, which represent between 70 to 100% of the industrial output of most goods are covered in the survey, so the results may be reliably used.

Consumption statistics for 1989 are available for animal feed and manufactured fertilizers, and these statistics were the basis for estimating corresponding figures for the base year of 1990. Consumption of other industrial commodities, basically food products, such as edible oils/fats and beverages has been distributed according to population.

Table 3-6-3 shows the results of surplus/deficit analysis of four industrial products as examples. Since over 75% of demand for edible oils/fats is covered by imports, the sea port governorates of Alexandria and Suez are the only two suppliers of that commodity to the rest of the country's governorates. Dakahlia governorate is the largest consumer of animal feed, yet it has a surplus which is probably distributed to surrounding deficit-showing governorates of Sharkia and Kafr el Sheikh. Port Said is the largest exporting port for beverages, and thereby has the largest deficit, as it does not produce that commodity.

Table 3-6-3 Surplus/Deficit Analysis for Industrial Commodities (1-1)
62. Edible Oil/Fats (Production, Foreign Trade, Consumption) in 1990

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/ Deficit
	Product.	Import	TOTAL	Consum.	Export	TOTAL	(+/-)
01 Cairo	2	0	2	74	0	74	-72
02 Alexandria	44	383	428	36	0	36	391
03 Port Said	0	0	0	5	0	6	-6
04 Suez	9	67	75	5	0	5	71
11 Damietta	0	0	0	8	0	8	-8
12 Dakahlia	11	0	11	39	0	39	-28
13 Sharkia	14	0	14	38	0	38	-24
14 Qalyubia	10	0	10	28	0	28	-17
15 Kafr el Sheikh	4	0	4	20	0	20	-16
16 Gharbia	26	0	26	32	0	32	-6
17 Minufia	0	0	0	28	0	28	-28
18 Beheira	0	0	0	41	0	41	-41
19 Ismailiya	0	0	0	7	0	7	-7
21 Giza	6	0	6	51	0	51	-45
22 Beni Suef	0	0	0	18	0	18	-18
23 Fayoum	0	0	0	19	0	19	-19
24 Minya	0	0	0	33	0	33	-33

Table 3-6-3 Surplus/Deficit Analysis for Industrial Commodities (1-2)

62. Edible Oil/Fats (Production, Foreign Trade, Consumption) in 1990

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/ Deficit
	Product.	Import	TOTAL	Consum.	Export	TOTAL	(+/-)
25 Asyut	0	0	0	28	0	28	-28
26 Sohag	12	0	12	34	0	34	-22
27 Qena	0	0	0	25	0	25	-25
28 Aswan	0	0	0	11	0	11	-11
31 Red Sea	0	0	0	1	0	1	-1
32 New Valley	0	0	0	1	0	1	-1
33 Matrouh	0	0	0	2	0	2	-2
34 North Sinai	0	0	0	2	0	2	-2
35 South Sinai	0	0	0	0	0	0	-0
TOTAL	138	450	588	588	0	588	0

Note: (1) Production: Amount from Central Bank of Egypt. Distribution of production based on data obtained from GOFI
(2) Export/Import from CAPMAS
(3) Consumption distributed according to 1990 population

Table 3-6-3 Surplus/Deficit Analysis for Industrial Commodities (2)

63. Animal Feed (Production, Foreign Trade, Consumption) in 1990

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/ Deficit
	Product.	Import	TOTAL	Consum.	Export	TOTAL	(+/-)
01 Cairo	26	0	26	18	0	18	8
02 Alexandria	157	76	233	88	0	88	145
03 Port Said	0	0	0	0	0	0	0
04 Suez	0	0	0	3	0	3	-3
11 Damietta	139	0	139	48	0	48	91
12 Dakahlia	536	0	536	389	0	389	147
13 Sharkia	360	0	360	381	0	381	-21
14 Qalyubia	204	0	204	79	0	79	126
15 Kafr el Sheikh	0	0	0	96	0	96	-96
16 Gharbia	768	0	768	317	0	317	451
17 Minufia	25	0	25	163	0	163	-138
18 Beheira	76	0	76	337	0	337	-261
19 Ismailiya	0	0	0	21	0	21	-21
21 Giza	145	0	145	70	0	70	75
22 Beni Suef	0	0	0	172	0	172	-172
23 Fayoum	49	0	49	170	0	170	-121
24 Minya	0	0	0	196	0	196	-196
25 Asyut	8	0	8	308	0	308	-300
26 Sohag	175	0	175	224	0	224	-49
27 Qena	552	0	552	137	0	137	415
28 Aswan	0	0	0	29	0	29	-29
31 Red Sea	0	0	0	4	0	4	-4
32 New Valley	0	0	0	7	0	7	-7
33 Matrouh	0	0	0	27	0	27	-27
34 North Sinai	0	0	0	9	0	9	-9
35 South Sinai	0	0	0	4	0	4	-4
TOTAL	3,219	76	3,295	3,295	0	3,295	0

Notes: (1) Production: Amount from Central Bank of Egypt data. Production distributed on governorates according to data obtained from GOFI.
(2) Export/Import figures from CAPMAS.
(3) Consumption of governorates extrapolated from 1988 figures produced in the CAPMAS agriculture statistics.

Table 3-6-3 Surplus/Deficit Analysis for Industrial Commodities (3)

64. Beverages (Production, Foreign Trade, Consumption) in 1990

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/Deficit
	Product.	Import	TOTAL	Consum.	Export	TOTAL	(+/-)
01 Cairo	12	0	12	55	1	60	-47
02 Alexandria	136	1	136	27	5	158	-22
03 Port Said	4	0	4	4	131	135	-132
04 Suez	0	0	0	3	1	4	-4
11 Damietta	0	0	0	7	0	7	-7
12 Dakahlia	118	0	118	32	0	32	86
13 Sharkia	73	0	73	32	0	32	41
14 Qalyubia	13	0	13	24	0	24	-11
15 Kafr el Sheikh	4	0	4	17	0	17	-12
16 Gharbia	48	0	48	26	0	26	22
17 Minufia	0	0	0	21	0	21	-21
18 Beheira	1	0	1	30	0	30	-29
19 Ismailiya	21	0	21	5	0	5	16
21 Giza	93	0	93	35	0	35	57
22 Beni Suef	0	0	0	13	0	13	-13
23 Fayoum	14	0	14	14	0	14	-1
24 Minya	18	0	18	25	0	25	-7
25 Asyut	7	0	7	21	0	21	-13
26 Sohag	1	0	1	23	0	23	-22
27 Qena	1	0	1	21	0	21	-20
28 Aswan	34	0	34	7	0	7	27
31 Red Sea	1	0	1	1	0	1	-0
32 New Valley	0	0	0	1	0	1	-1
33 Matrouh	1	0	1	2	0	2	-0
34 North Sinai	0	0	0	2	12	14	-14
35 South Sinai	0	0	0	0	3	3	-3
TOTAL	599	1	600	447	153	600	0

Notes: (1) Production: Amount obtained from CAPMAS, and distribution from GOFI.
(2) Exports/Imports from CAPMAS.
(3) Consumption distribution based on 1990 population.

Table 3-6-3 Surplus/Deficit Analysis for Industrial Commodities (4-1)

80. Manufactured Fertilizer (Production, Foreign Trade, Consumption) in 19

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/Deficit
	Product.	Import	TOTAL	Consum.	Export	TOTAL	(+/-)
01 Cairo	122	0	122	5	0	5	118
02 Alexandria	1,137	484	1,622	128	49	177	1,444
03 Port Said	0	0	0	9	0	9	-9
04 Suez	1,524	0	1,524	106	5	111	1,413
11 Damietta	0	0	0	570	0	570	-570
12 Dakahlia	66	0	66	681	0	681	-615
13 Sharkia	0	0	0	218	0	218	-218
14 Qalyubia	590	0	590	429	0	429	161
15 Kafr el Sheikh	0	0	0	376	0	376	-376
16 Gharbia	848	0	848	351	0	351	497
17 Minufia	0	0	0	815	0	815	-815
18 Beheira	0	0	0	149	0	149	-149
19 Ismailiya	0	0	0	50	0	50	-50
21 Giza	0	0	0	63	0	63	-63
22 Beni Suef	0	0	0	265	0	265	-265
23 Fayoum	0	0	0	241	0	241	-241

Table 3-6-3 Surplus/Deficit Analysis for Industrial Commodities (4-2)

80. Manufactured Fertilizer (Production, Foreign Trade, Consumption) in 19

(1000 Tons)

Governorate	SUPPLY			DEMAND			Surplus/ Deficit
	Product.	Import	TOTAL	Consum.	Export	TOTAL	(+/-)
24 Minya	0	0	0	324	0	324	-324
25 Asyut	877	0	877	429	0	429	449
26 Sohag	0	0	0	289	0	289	-289
27 Qena	0	0	0	17	0	17	-17
28 Aswan	530	0	530	263	0	263	266
31 Red Sea	0	0	0	252	0	252	-252
32 New Valley	0	0	0	91	0	91	-91
33 Matrouh	0	0	0	2	0	2	-2
34 North Sinai	0	0	0	0	0	0	0
35 South Sinai	0	0	0	3	0	3	-3
TOTAL	5,695	484	6,179	6,125	54	6,179	-0

Notes: (1) Production amount from CAPMAS statistics and distributed according to GOFI data.
(2) Foreign trade based on CAPMAS data
(3) Consumption distributed according to CAPMAS agricultural statistics

3.7 Production Trends

Production trends of the major commodities are important inputs in the forecasting process. Attempts were made to collect past production volumes, in addition to volumes forecast in the new Five-Year Plan. These figures are shown in Table 3-7-1.

Table 3-7-1 Domestic Production of Study Commodities (1)

Unit:1,000 ton

Code	Commodity Name	Past Records				3rd Five Year Plan Period		
		1987	1988	1989	1990	1991/92	1992/93	1996/97
1	Crude Oil	40,240	45,177	42,845	43,952	46,095	45,253	46,408
2	Petroleum Product	21,287	21,328	21,929	23,157	23,850	22,800	25,700
	Gasoline	2,090	2,284	2,352	2,172	2,245	2,090	2,150
	Fuel Oil (Mazout)	10,353	10,302	10,431	11,312	11,713	10,872	12,623
	Diesel Oil/Solar	3,604	3,673	3,777	4,230	4,155	4,300	4,963
	Kerosene	2,325	2,325	2,385	2,334	2,310	2,180	2,010
	Other Petr. Prod.	2,915	2,744	2,984	3,109	3,427	3,358	3,954
3	Natural Gas	4,491	5,148	5,504	6,110	6,700	8,876	11,025
4	Cement	NA	42,717	42,139	44,926	58,100	67,750	70,400
	Lime Stone	27,000	30,600	28,800	28,800	40,800	50,000	50,850
	Cement/Clinker	NA	12,117	13,339	16,126	17,300	17,750	19,550
5	Other Const. Mat.	58,488	126,393	134,569	155,073	125,404	142,503	197,116
	Gravel/Sand/Earth	56,755	46,663	51,724	61,092	123,991	140,875	194,950
	Bricks		77,600	80,700	92,000	NA	NA	NA
	Gypsum	1,612	1,981	1,969	1,802	1,210	1,420	1,919
	Glass/Ceramic	28	28	29	33	26	26	39
	Other Const. Mat.	93	121	147	146	178	182	209
6	Phosphate	682	835	780	947	1,270	1,325	2,600
7	Iron Ore	2,048	2,109	2,562	2,405	2,400	2,700	3,000
8	Coal/Coke	912	931	1,035	1,131	1,266	1,454	2,161
9	Other Minerals	8,450	9,237	7,849	9,773	8,930	9,224	11,807
	Salt	1,233	1,849	1,162	1,125	1,725	1,800	2,795
	Sulfur/Pyrites	NA	NA	NA	2	3	3	3
	Clay/Kaolin	5,634	6,137	5,918	7,683	6,818	6,985	8,408
	Other Minerals	1,583	1,251	769	963	385	437	601
10	Wheat	2,721	2,838	3,182	4,268	4,662	4,265	5,280
11	Other Cereals	16,563	16,726	17,631	19,725	25,249	25,806	27,750
	Millet/Sorghum	551	586	585	628	689	712	692
	Rice	2,279	2,312	2,679	3,168	3,574	3,524	3,766
	Barley	148	120	138	150	147	227	224
	Maize	3,619	4,088	4,529	4,799	5,241	5,397	6,008
	Milling products	9,966	9,620	9,700	10,980	15,598	15,946	17,060
	Other Cereals							
12	Fruit/Vegetable	16,050	15,183	14,673	15,285	17,747	17,999	22,305
	Citrus/Orange	1,387	1,199	1,574	2,037	^	^	^
	Grapes	510	557	621	585	^	^	^
	Water Melon/Melon	1,659	1,574	1,426	1,287	^	^	^
	Other Fruits	1,770	1,829	1,932	1,731	^	^	^
	Potatoes	1,801	1,862	1,657	1,638	^	^	^

Table 3-7-1 Domestic Production of Study Commodities (2)

Unit:1,000 ton

Code	Commodity Name	Past Records				3rd Five Year Plan Period		
		1987	1988	1989	1990	1991/92	1992/93	1996/97
	Tomatoes	4,921	4,212	3,997	4,234	^	^	^
	Onion	618	662	445	577	^	^	^
	Other Vegetables	3,384	3,288	3,021	3,196	^	^	^
13	Sugar Cane	8,424	10,795	11,213	11,144	11,621	11,773	12,330
14	Fibre Crops	1,661	1,530	1,431	1,428	1,385	1,522	1,717
	Cotton &Cot. Seed	1,565	1,414	1,318	1,342	1,291	1,407	1,591
	Other Fibre Crops	96	116	113	86	94	115	126
15	Livestock	2,027	2,071	2,116	2,159	2,241	2,281	2,446
16	Animal Products	1,650	1,631	1,650	1,703	1,862	1,894	2,051
	Meat Products	494	505	513	533	551	551	575
	Poultry Products	650	628	626	636	700	716	772
	Dairy Products	273	243	229	228	266	270	280
	Fish	233	255	282	306	345	357	424
17	Other Agric. Prod.	1,685	1,543	1,570	1,452	1,549	2,044	3,324
	Oil Crops	195	204	165	180	278	304	450
	Food Leg. Crops	1,290	1,139	1,205	1,072	1,071	1,540	2,674
	Tobacco	0	0	0	0	0	0	0
	Other Agric. Prod.	200	200	200	200	200	200	200
18	Sugar Prod.	1,459	1,417	1,213	1,068	1,377	1,411	1,639
	Refined Sugar	1,097	1,053	831	853	1,050	1,070	1,270
	Molasses	362	364	382	215	327	341	369
19	Edible Oil/Fats	153	120	126	138	432	480	565
20	Animal Feed	3,251	3,388	3,501	3,219	4,950	5,090	6,190
21	Beverages	758	689	661	599	1,119	1,198	1,440
22	Other Food Prod.	388	428	359	370	403	416	456
	Tea/Coffee	0	0	0	0	81	82	93
	Food Preserves	27	22	29	25	95	99	107
	Other Food Prod.	361	406	331	345	228	235	256
23	Chemical Products	692	666	738	779	922	956	1,137
	Chemicals	313	327	339	362	457	467	542
	Detergents & Soap	379	339	399	417	465	489	595
24	Metal & Met. Prod.	1,661	2,443	2,667	3,127	3,643	3,711	4,129
	Fer. Metal Prod.	1,363	2,017	2,111	2,593	3,115	3,165	3,469
	Non-Fer. Met Prod.	298	426	556	534	528	546	660
25	Textiles	2,227	2,179	2,164	2,388	2,500	2,600	3,200
	Cotton Yarn/Text.				1,750			
	Wool Yarn/Text.				581			
	Other Yarn/Textile				57			
26	Manufc. Fertilizer	5,239	5,373	5,560	5,695	6,869	6,960	8,352
27	Pulp/Paper Prod.	233	236	257	237	345	366	440
	Pulp	15	17	22	22	22	22	23
	Paper & Paper Prod	218	219	235	215	323	344	417
28	Lumber and Timber				1,030			
29	Other Manf. Goods	186	210	181	144	217	230	263
	Elec. & Mech. Good	127	156	133	111	141	150	184
	Other Manf. Goods	59	54	49	33	77	79	79

In the last four years production volumes for most commodities have shown an increase, with the exception of such commodities as gypsum, poultry, dairy products, sugar products, animal feed, and beverages.

Future forecasts show production decline in gasoline. The decline of the above commodities is forecast to be arrested in the next five years.

CHAPTER 4 HIGHWAY

4.1 Highway Network and Administration System

4.1.1 Introduction

The total length of the paved highways in Egypt in 1992 according to the statistics of the General Authority for Roads and Bridges (RBA) of the Ministry of Transport is 32,515Km, about half of them is under the jurisdiction of RBA and the other half is under the jurisdiction of the local governorates. This 32,515Km paved road network includes the inter city road network as well as other paved roads connecting the capitals of the marakez to the villages. The figure includes also the main urban roads in Cairo and Alexandria. Divided highways are double counted in the previous figure.

RBA is the governmental body in the Ministry of Transport responsible for construction, upgrading and maintenance of the inter city main highway network and its infrastructure. The inter city highway network has been defined in this Study as the road network connecting the capitals of the governorates with each other, and the capitals of the marakez within each governorate with each other and with the capital of their governorate (mostly the main cities within the governorate boundary). This inter city road network includes all highway links belonging to RBA. Also some roads connecting the marakez with each other sometimes belong to the governorates i.e. to the Ministry of Local Government. Local highways connecting the capitals of the marakez and the villages within the boundary of each governorate, are the responsibility of the local authorities in the governorate and belongs to the Ministry of Local Government and not to the Ministry of Transport. These local highways are not included in the Study.

Fig. 4-1-1 presents the inter city highway network. The figure presents all the capitals of the governorates and the marakez. The capitals of the governorates are represented in the figure by empty squares, while the capitals of the marakez are represented by empty circles. As it is clear from the figure, the network connects all the capitals of the governorates and the marakez. Filled circles represent important villages, branching points in the highway network, or the limit of an administrative agency responsible for the construction and maintenance of a highway link. All the roads presented in the figure are paved, some of them are 4-lane divided highways, and the majority are two lane two-way highways having carriageway width varying between 6.0m and 7.5m. A small portion of the Cairo/Alexandria agriculture road has been recently (in 1991/1992) widened to 6-lane divided highway.

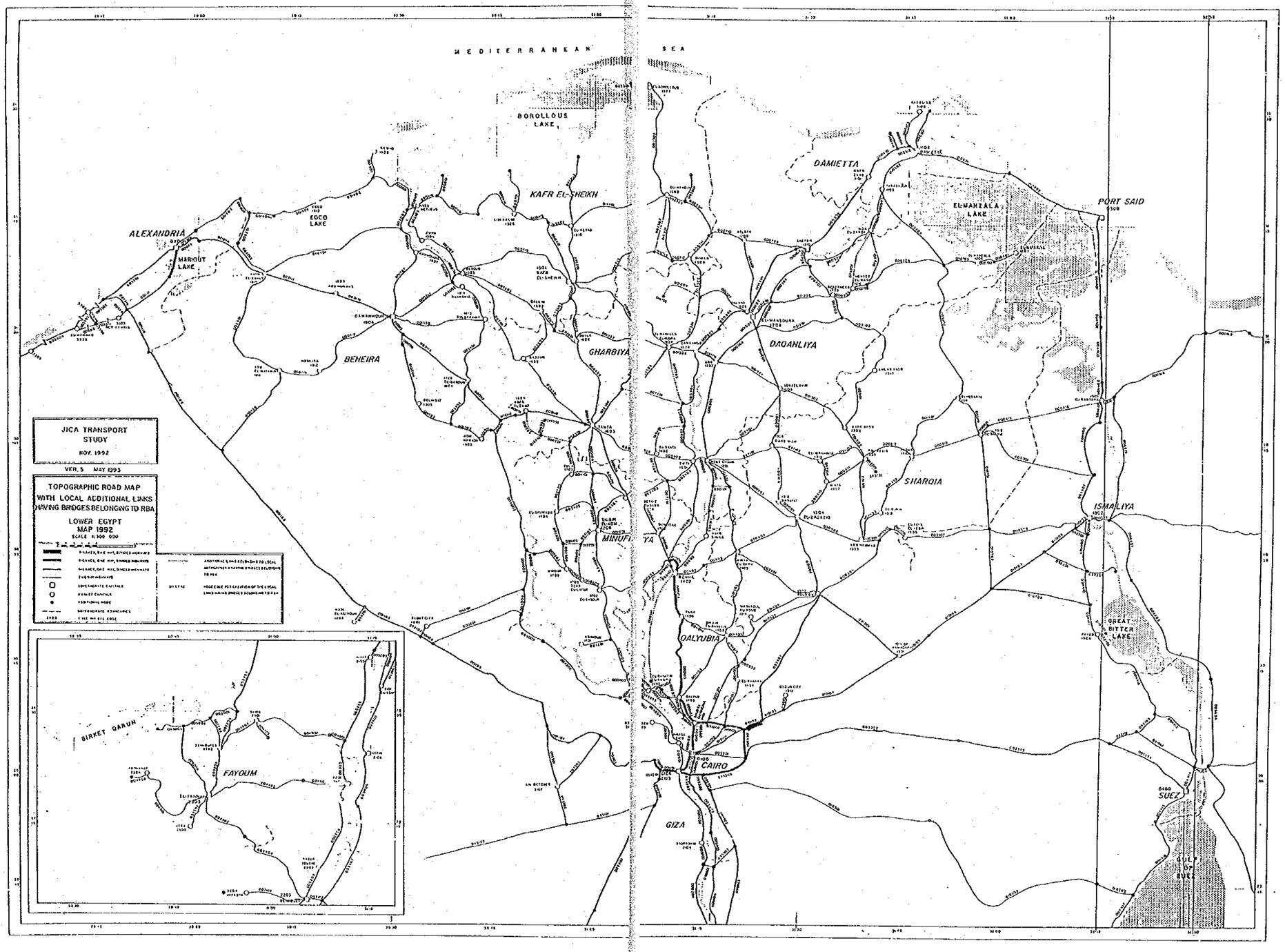

Fig. 4-1-1 Inter City Highway Network (1)

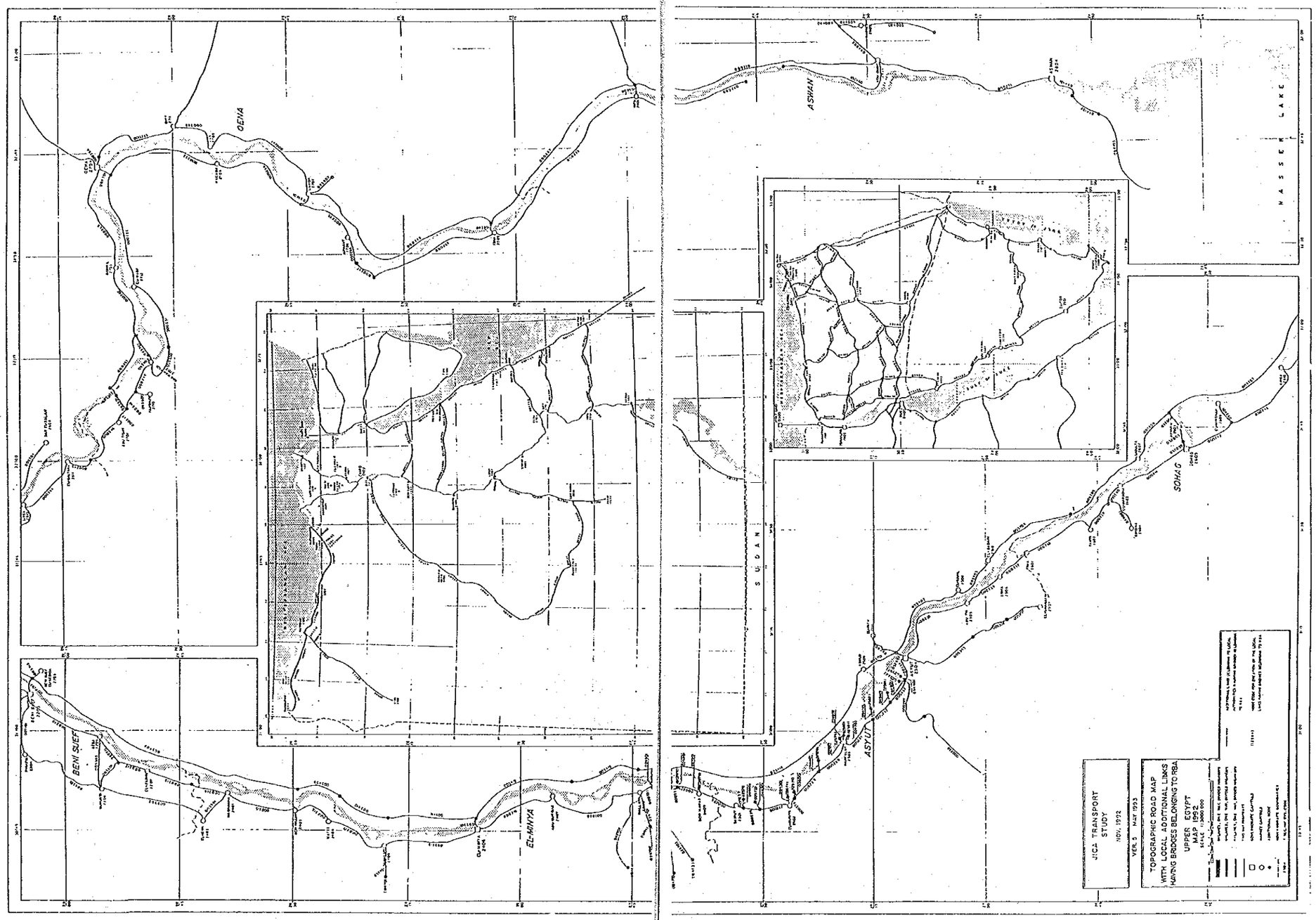

Fig. 4-1-1 Inter City Highway Network (2)

The inter city highway network consists of several routes. The majority of the routes are given route numbers by RBA, for example, route number 1 is the Cairo/Alexandria agriculture highway, route number 2 is the Cairo/Aswan highway, and route number 3 is the Cairo/Ismailia (agric.)/El-Aoga (Sinai) highway. Table 4-1-1 presents the route numbering system, the names of the routes, the number of the links included in each route, and route lengths. The link is defined as a part of the route having constant operational characteristics and belongs to one administrative agency responsible about its maintenance (RBA district or local governorate).

The inter city highway network has a total route lengths of 14,028Km (with no double count for divided highways), and the network includes 760 links, some of them are one way links in divided highways, and the majority are two-way two lane links.

4.1.2 The RBA Administration

The organizational chart of RBA is shown in Fig. 4-1-2. There are two sectors and a central administration which reports to the RBA chairman. The first sector is called the sector for projects investigations. It is concerned with the planning, design, and specifications of the construction and maintenance of the inter city highways and bridges. The first sector has two central administrations, one for highways, and the other for bridges, and the heads of these central administrations has to report to the head of the project investigations sector. The first sector includes also the central laboratories and quality control directorate.

The second sector is called the projects execution and districts sector. It is responsible for the execution and maintenance of the highways and its bridges. It includes a central administration for the execution and maintenance of highways, a central administration for the execution and maintenance of bridges and buildings, 9 districts, and a directorate for toll express roads. The heads of these units has to report to the head of the sector for projects execution and districts. Also there is a directorate for mechanical and electrical engineering, which advice the head of the sector about all matters related to highway equipments. Further details of the subdivision of the projects investigations sector and the execution and districts sector are illustrated in Fig. 4-1-2.

Table 4-1-1 Routes Description of the Inter City Highway Network

Route No.	Route Description	No of Links	Route Length(Km)
0001	CAIRO-ALEXANDRIA (AGRIC.)	38 *	224.0
0002	CAIRO-ASWAN & ASSUIT-NEW VALLEY-PARIS	81 *	1,460.0
0003	CAIRO-ISMAILIYA(AGRIC.)-EL AOGA	16	342.5
0004	EL QANATER EL KHAIRIA-TANTA-METUBUS	17	171.0
0005	DAMIETTA-MANSOURA-BENHA-QALYUB	19 *	197.0
0006	EL KHATATBA-BENHA-EL QANTARA-RAFAH	24	421.0
0007	EL MANZALA-KAFR EL SHIEKH-ABU MATAMEER	21 *	233.2
0008	ZIFTA-BENHA-SAMANOUD-DAMIETTA	23 *	158.1
0009	ABU HAMMAD-ZAGAZIG-MEET GHAMR-TANTA	6	78.5
0010	10TH OF RAMADAN-ZAGAZIG-MANSOURA	8 *	96.5
0011	CAIRO-ALEXANDRIA (DESERT)	24 *	224.0
0012	MEET FARES-TALKHA-TIYRA	4	62.5
0013	ABU HAMMAD-EL MEHALLA-DAMANHOUR	10 *	124.2
0014	EL NESANYA-BELBIES-QALYUB	6	98.0
0015	MEET GHAMR-SHIBIN EL QANATER	3	50.0
0016	SHIBIN EL KOM-QUESNA	1	11.0
0017	KOM HAMADA-DAMANHOUR-MAHMOUDIA	6	61.0
0018	ALEXANDRIA-ABU QUER-RASHID	7	57.0
0019	GIZA-IMBABA-OSSEM	2	17.5
0020	SHUBRAKHIT-MAHMOUDIA-EL BOSILY	6	68.0
0021	BASYUN-METUBUS	3	49.0
0022	CAIRO-FAYOUM-BENI SUEF	15 *	142.0
0023	EL BOROLLOUS-EBSHAN-EL MEHALA-TANTA	9 *	108.5
0024	SENBELAWIN-MEET GHAMR-ZIFTA-SH. EL KOM	5	68.0
0025	TANTA-MINOUF	5	40.0
0026	QUTUT-DESOUQ-BASYUN	5	57.0
0029	KAFR EL DAWAR-ABU EL MATAMEER	1	35.0
0030	EL FERDAN-EL SALHIA	1	32.0
0031	KAFR SAQR-DEKERNESS	3	46.5
0032	EL SALHIA-FARASKOUR	3	74.5
0033	CAIRO-SUEZ	8 *	133.5
0034	SHUBRAKHIT-ITAY EL BAROUD-EL TOOD	2	34.0
0038	TALKHA-BELKAS	1	18.0
0039	MINYA EL QAMH-BELBIES-HAIKESTEP	3 *	55.0
0040	EL TAWFIKIA-EL MARG-TOUKH	14	162.4
0041	TALA-BERKET EL SABAA	2	18.0
0042	SENTRES-ASHMOUN	1	8.0
0043	BASYUN-TANTA	1	23.0
0044	PORT SAID-SUEZ-BERNICE	34 *	957.8
0045	MEHALA EL KUBRA-KAFR EL SHEIKH	1	26.0
0046	EL WASTA-EL FAYOUM-ETSA	3	46.0
0048	GIRZA-SENNOURES-TAMIA	4	40.0
0049	EL FAYOUM-ABSHAWAI-GABAL SAAD	2	31.0
0050	EL MASALLAT-EL OBERG-EL FAYOUM	4	46.0
0052	ABU QUER-ABIS-KAFR EL DAWAR	2	25.0
0053	IHNASYA-EL IDWA,ASUIT-EL GHANAIEM	6	102.4
0054	CAIRO-EL SAFF-EL MINYA-ASUIT	19 *	549.0
0055	ALEXANDRIA-MATROUH	29 *	871.0
0056	SIDS-SUMUSTA	1	11.0
0057	ABNOUB-EL BADARI-DAR EL SALAM	7	152.0
0059	MAGHAGHA-EL IDWA	1	10.0
0066	EL QANTARA SHARQ-RAS MOHAM.-RAS EL NAQAB	20	873.0
0071	BENI SUEF-IHNASIA	3 *	15.0
0072	QUESNA-EL SANTA	3	38.5
0073	EL MAHALLA EL KUBRA-BIYALA	2	26.0
0074	EL AZIZIA-SHABSHIR	1	13.0
0077	QENA-SAFAGA	3	169.0
0082	KAFR EL SHURFA-EDSHAY-KAFR DEIMA	3	20.5
0088	QAFT-EL QUSEIR	2	180.0
0099	IDFU-MERSA ALAM	5	228.0
0101	CAIRO-ISMAILIYA (DESERT)	18 *	121.0
0103	EL MAADI-EL AIN EL SOKHNA	3	165.0
0107	EL SALHIA-ABU SOLTAN	4 *	71.5
0109	DAMIETTA-PORT SAID	4 *	51.0
0120	ABU KEBIR-EL DAHTAMOUN	1	6.0
0144	EL MAHOUL-SHALAMA	2	29.0
0168	EL MAHOUL-EBSHAN	1	18.0
0184	KAFR EL DAWAR-MENYT EL SAID	1	37.0
0194	EL SANTA-SONBAT	1	14.0
0267	MALLAWI-EL BADRMAN	3	20.5
0269	EL MAASARAH-EL MAASARAH BR.	1	1.0
0270	DAIR MAWAS-DAIR MAWAS BR.	1	1.5
0320	SOHAG-AKHMIM-EL HAWAWISH	3	11.0
0329	ASUIT-EL PATH	2	10.5
0360	NAZALY GANOUB-NAZALY GAN.BR	1	1.0
0392	MANFALUT-MANFALUT BR.	3	4.5
0398	TAL EL AMARNA-TAL AMARNA BR.	1	1.0
0427	MALLAWI-EL SWAHGA	1	13.0
0490	GIHEINA-BANAWEET	1	10.0
0492	SANABO CON.-SANABO BR.	1	0.5
0494	AWLAD RAYEK-BANI HUSSEIN	1	2.0
0577	SAMALUT-SHUSHA	1	5.5
0712	EL MANSOURA-DEKERNES	2	22.6
0747	MENYET EL NASR-EL ZARQA	1	10.0
0752	KAFR EL SHEIKH-TOLOMBAT NO.7	2	32.0
0782	EL TAHRI-EL ZARQA	1	11.5
0907	SIDI SALEM-TOLOMBAT EL ZINY	1	17.0
0908	MASRAF 11-TOLOMBAT 11	1	3.5
0909	TOLOMBAT 3-TOLOMBAT 4	1	7.0
0910	EL SHATT-NAKHL-TABA	9	285.0
0911	MAFAREQ EL BOHIRAT-EL MELEEZ CONN.	2	81.0
0912	SEDR EL METAN-EL AOGA	4	176.0
0913	BEIR EL ABD-EL MAGHARA	7	202.0
0914	EL ARISH-MAFAREQ 161 ISMAILIA	7	146.0
0915	BALOUZA-RAS SEDR	4	190.0
0916	MAFAREQ EL TOR-SAINT KATRIN-MAF.DAH/NWB	3	178.0
0917	MAFAREQ 156 ISM.-EL HASANA-NAKHIL	2	91.0
0918	RAFAH-EL AOGAA-RAS EL NAQAB	3	245.0
0921	KM 109 CAIRO/SUEZ-KM 18 SUEZ/ISHAILIA	2	24.0
0922	KM 105 CAIRO/ISHAILIA DESERT-EL TASAH	3	53.5
0923	KM 112 CAIRO/ISM.-ISM./SUEZ RD.ENT.	1	4.0
0924	FAYED-EL SAWAHIL	1	1.5
0931	GIZA-BAHARIA OASIS-NEW VALLEY	13	924.0
0932	EL SHEIKH FADL-RAS GHARIB	4	240.0
0933	EL MINYA BR.	2 *	2.5
0934	EL MINSHAH CON.	1	6.0
0935	QANATER NAG HAMMADI-HASSANAT	2	8.0
0936	FARSHUT CON.	1	6.5
0937	NAG HAMMADI BR.-EL TAARIF	2	10.5
0938	LUKOR-LUKOR AIRPORT	2	10.0
0939	QANATER ISNA	1	3.0
0940	KOM OMBO-NASSER	5	91.5
0941	ASWAN-WADI HALFA	6	345.0
0942	EL QURASHIAH-QURASHIAH BR.	1	0.5
0943	EL QUSIYA-QUSIYA BR.	1	1.0
0944	BANI QURAH-BANI QURAH BR.	1	1.0
0945	EL HAWATKA CON.-EL HAWATKA	1	1.5
0946	MNQBAD-MNQBAD BR.	2	2.0
0951	EL OBOUR CITY INTERANCE	1	4.0
0952	SHUBRA EL KHEIMA-EL QANATER EL KHAIRIA	5	15.6
0953	6TH OCTOBER INTRANCES	3	56.0
0954	BENHA TO BENHA N.BR.	2	1.5
0955	RING ROAD	14 *	55.0
0956	MARAZIK BR.-15 MAY	2	7.5
0959	EL MAADI-15 MAY-EL SAFF	6 *	60.0
0961	SHIBIN EL KOM-SERS EL LAYAN-GHAMREEN	3	19.5
0971	MEET GHAMR-DIARB NIGM-MIHYA	4	42.0
0972	MEET ABU KHALID-SUHREGT KUBRA	1	4.5
0981	KAFR DAWOOD-SADAT CITY	2	40.2
0982	WADI EL NATROUN-W.NAT.CON.	1	4.5
	Total	760	14,028.0

*) All or part of the route is divided highway, number of links are double counted for divided highway, and the routes lengths do not include double count for divided highways.

In addition to the previous two sectors, there is a central administration for finance and administration which is responsible for all financial and personnel affairs and reports directly to the RBA chairman. The central administration for finance and administration is subdivided into the finance directorate and the administration affairs directorate.

Beside the two sectors and the central administration for finance and administration, there are several offices which assists the RBA chairman directly, such as the office for planning and follow-up, road construction companies affairs, legal affairs, information center and DSS, management and organization, finance & administration inspection, training center, public and security affairs, public services, etc. Each of these offices is headed by a director, who reports directly to the RBA chairman.

4.1.3 The RBA Districts

The highway network under the jurisdiction of RBA is divided into nine geographical districts and the toll express roads directorate. Each of them is responsible for the construction, upgrading, and maintenance of the main inter city highway links and bridges existing in its territory. These districts, with the location of its central offices, together with the district notation, are as follows:

- First district, CENTRAL(C) ,and having its central office in Nasr city, Cairo
- Second district, CANAL & SINAI(S)), Ismailia
- Third district, EAST DELTA(E), Zagazig
- Fourth district, MIDDLE DELTA(M), Tanta
- Fifth district, WEST DELTA(W), Alexandria
- Sixth district, BENI-SUEF(B), Beni-Suef
- Seventh district, ASYOUT(A), Asyuot
- Eighth district, QENA(Q), Qena
- Ninth district, RED SEA(R), Hurdagha
- Tenth district, TOLL express roads directorate, Haram/Giza

The tenth district, i.e. the toll express roads directorate, with its central office in Cairo, is responsible for the maintenance and operation of the toll roads from the revenues collected from the road users, irrespective of the geographical locations of the roads.

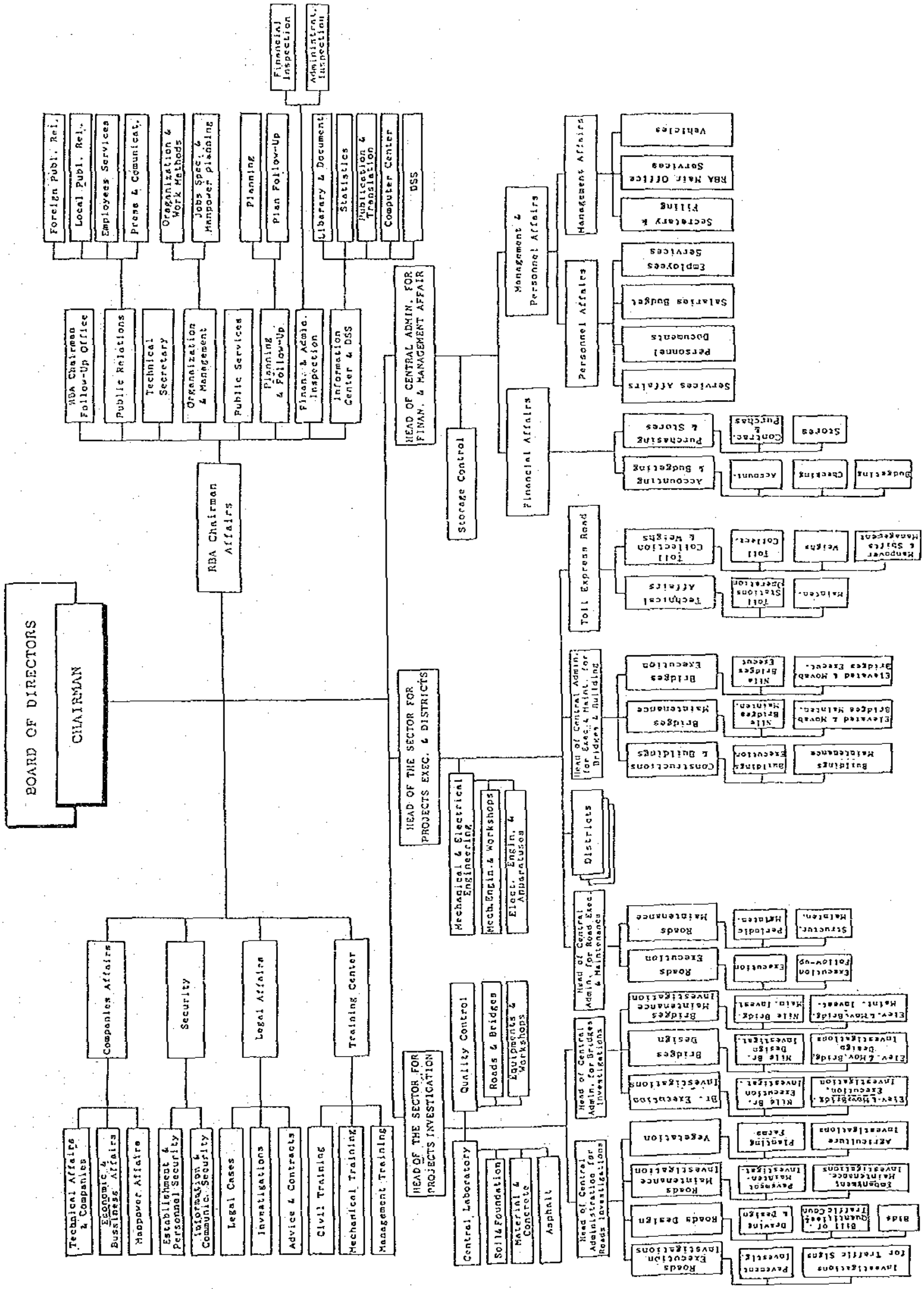

Fig. 4-1-2 Organizational structure of RBA

4.1.4 Link Coding System

For the description of the road infrastructure it is necessary to define clearly the elements of the network. The definition has to enable the filing and presentation of two types of data:

- Road Inventory (R.I.) physical data, such as dimensions of the cross-section of the different road segments, pavement condition, road furniture such as traffic signs, traffic signals, lighting posts, road marking, etc. These data about the different road segments are necessary for routine and structural maintenance plans of the highway network.

- Network operational data, such as road type, whether it is one way or two-way, lengths, speeds and capacities of the different segments of the highway network. These data are necessary when making assignment runs i.e. assigning present or future vehicular O/D matrices to the highway network.

Normally, the highway network is defined by nodes and links. The links could be divided further into sections, so that the successive sections of a link constitute its total length. The section in a link is the basis of compiling the R.I. physical and pavement condition data, while the entire length of a link together with its operational data forms the basis of a network configuration required for the traffic assignment purposes. A section has to have homogeneous physical and operational characteristics over its length, while the link has to have only homogeneous operational characteristics over its entire length.

Each link will be defined by an innode and an outnode. The number of nodes in a network, and consequently the number of links in a network, depends on the purpose of the study. The number of links is heavily correlated to the number of zones i.e. on the zoning system adopted in the relevant study. As the present study is concerned with transport planning on the strategic level, and as the finest zoning system adopted is on the level of the marakez (to serve passenger transport movements), the lengths of the links should correspond to the distances between marakez.

Based on the above,the nodes in the network have been chosen as the capitals of the governorates and marakez, important villages, points of road branching, and/or end of a road administrative agency responsible about the link. The whole length of a link should lie in one RBA district, or in the governorate which is responsible about all technical and administrative works required for the efficient and safe operation of the link.

Each link will be identified by giving code numbers to

their innode and outnode. The code numbers will be chosen to represent the geographical location of the node within Egypt. According to the recommendations made in the transport sector information system project, which is currently in run by TPA, a unified coding system has been defined for all inland transport modes. The code number of any node consists of 5 digits:

- The first digit from left indicates the type of mode; (1) for highways, (2) for railways, and (3) for waterways.
- The following two digits from left indicate the governorate where the node exists. Code number of governorates are the same as that defined by CAPMAS.
- The last two digits represent the serial number of the node within the governorate. Serial number of nodes between 1 and 30 indicates that the node represents a capital of a markaz within the corresponding governorate. Here again, the same coding system of CAPMAS for the marakez within the governorates has been followed. According to CAPMAS, marakez are given serial numbers starting from one within each governorate. The maximum number of marakez in a governorate in Egypt is 18. Nodes having serial numbers within the governorate more than 30 represents additional nodes other than capitals of marakez and could be a branching point in the highway network, an important village, or an end of one of the administrative agencies responsible about engineering and management works of the link.

4.1.5 The Egyptian Inter City Highway Network

The inter city highway network will be simulated into a node and a link map. The basis of the simulation is the map published in the technical report number two of the Transport Sector Information System Project in May 1992. However, additional nodes and links have been added to this map by the Study Team, together with necessary checks and modifications, so that the map can serve as a basis for RBA database management system for highway maintenance, and also the needs for developing the Egyptian inter city highway node and link model required for transport planning on the strategic level. Road physical characteristics and furniture are the needs of the highway maintenance, and link operational characteristics are the needs for the strategic planning. A revised link and node map has been produced by the Study team for the year 1992, in co-operation with officials from RBA road maintenance central administration. The basis for this map were the R.I. sheets filled with data collected by the districts engineers during the period December 91/November 1992, the official highway map scale 1:300,000 published by RBA, and topographic maps of the survey department scale 1:100,000 with identification of the highway links belonging to each district and to each of the 26 governorates. The production of the revised node and

link file consumed a lot of effort from the team, including enquiries from districts engineers about missing links, comparisons with data about network configuration compiled in previous national transport studies and other recent studies. The revised link and node file for the year 1992 produced by the Study team is found in the project working files. The content of the file matches with the route map given in Fig. 4-1-1. A computerized production of the node and link file has been created by the Consultants after giving the nodes their x- and y-coordinates according to their longitudes and latitudes. The computerized graphic presentation for the node and link file for the Egyptian highway network is presented in Fig. 4-1-3.

4.1.6 Data About Operational and Physical Characteristics of the Egyptian Inter city Highway Network

Data about road characteristics have been compiled by the Study team from road inventory data surveyed by the RBA district engineers in the period December 1991/November 1992. These data have been compiled into three main files groups:

- INVA?.LST files, containing the operational characteristics of the network. The files contain the name and code of the link, the RBA district to which the link belongs, codes of the in- and outnodes of the link, and other relevant operational data. These files are called the inventory files. A file has been assigned for each district (?=E for East delta, ?=A for Asyout, ..etc.).

- INVB?.LST files, which are considered as extension of the inventory files and containing the furniture of the network. The data are presented also into group of records, each record presents the data about a section in a link.

- ASS?.LST files, containing data about pavement conditions for the highway network. These data are presented for each homogeneous section within a highway link in a separate record.

In addition to these three groups of files, data about operational and physical characteristics of the bridges on each highway link has been collected with the assistance of the RBA bridge central administration and bridges districts engineers. These data have been compiled in a fourth group of files, as will be explained in Section 4.2.

In addition to the data surveyed by the RBA district engineers, which is considered to be a part of the routine work of the concerned departments in RBA Organization, the Study team has made use also from the R.I. data surveyed in the framework of the recent studies carried out during the period 1990/1991, as has been mentioned before. The first one was the study of "Transport on Egyptian Highway Networks, 1990" carried out by DRTPC of Cairo university under the supervision of TPA, and the second one was the "Study of the Effect of the Axle Load on Pavement Deterioration of Egyptian Highways, 1991" carried out by the National Institute of Transport under the supervision of RBA. Both studies had used the same database, which had been collected by universities students in collaboration with RBA district engineers during May/July 1990.

The Study team has amended the above mentioned RBA files with additional links found in these recent studies and belonging to local authorities, to guarantee the connection of all marakez to the inter city highway network, as the inter city highway network under the jurisdiction of RBA connects only some and not all the marakez found within the governorates. Also when a link length under the jurisdiction of RBA forms a part of the arc connecting two adjacent capitals, this arc has been divided into two or more links, each belonging to a separate agency.

4.1.7 Highway Network Operational characteristics

The Study team has compiled from data collected by the highway districts engineers, and from data collected in other studies, the relevant data items for network operational characteristics. A sample of the compiled data items are presented in Table 4-1-2. For the complete set of data about the whole network, refer to the files "INVA?.LST". Following are short explanations for the different columns of Table 4-1-2:

Columns 1&2: innode and outnode code numbers.
Column 3: link name.
Column 4: district code. The letters indicating the district codes are as given in Section 4.1.3. Links under the jurisdiction of local authorities are indicated with an L. Important links like ferries, bridges, barrages, which are necessary for network continuity, and not belonging to the Ministry of Transport are indicated with letter I.
Column 5: road type according to the RBA road maintenance

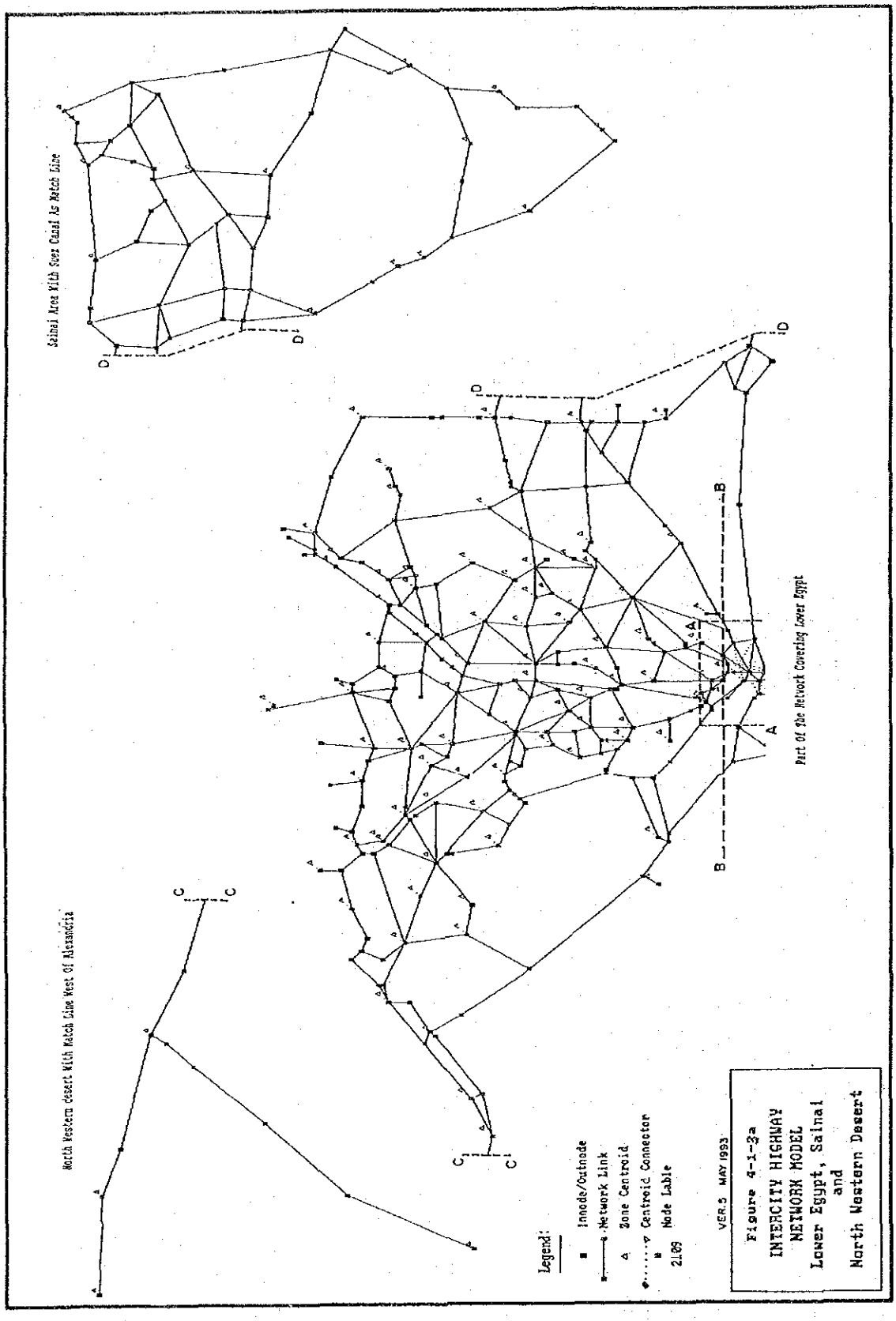

Fig. 4-1-3 Computerized Node and Link Map for the Egyptian Highway Network, 1992,
a) Lower Egypt

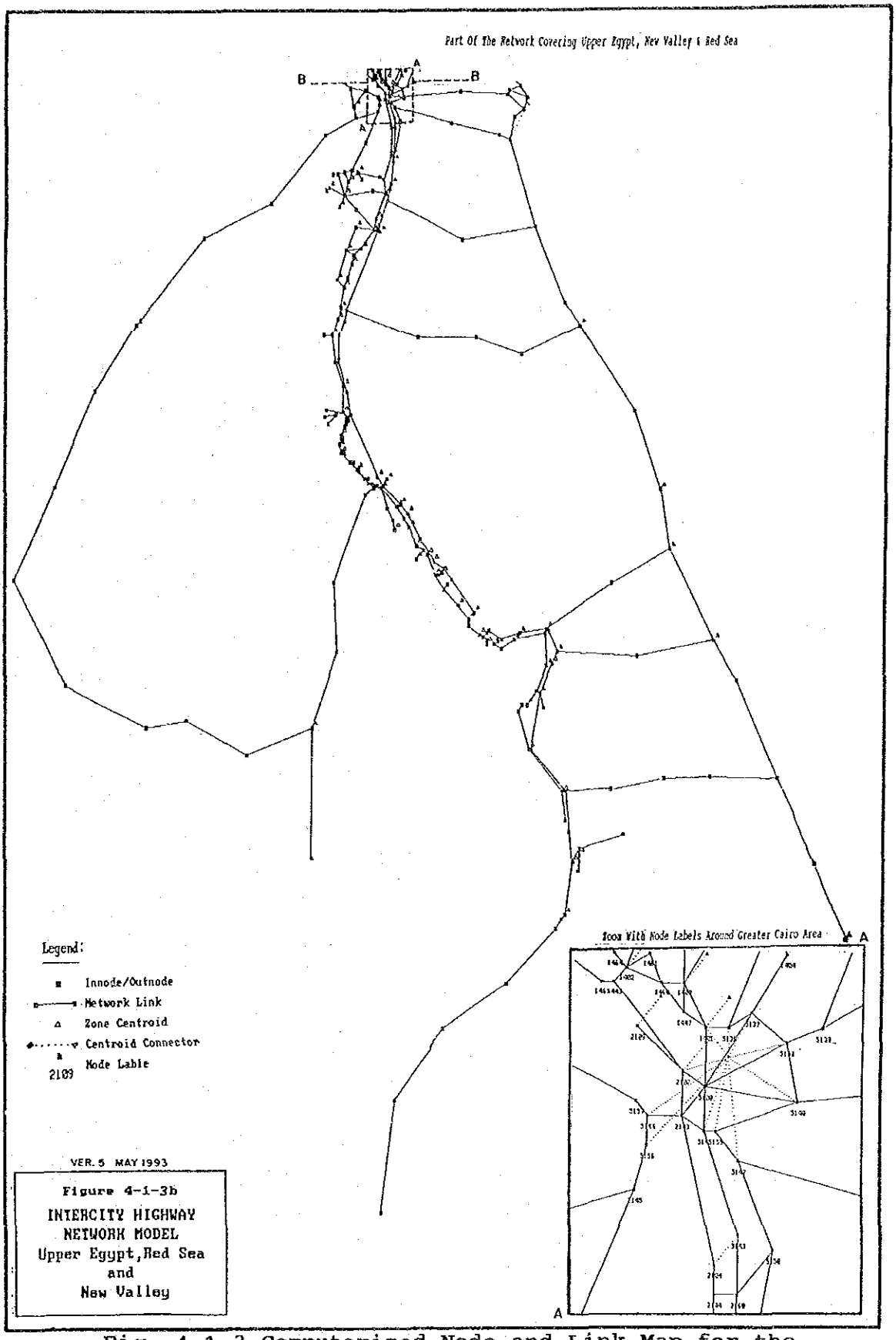

Fig. 4-1-3 Computerized Node and Link Map for the Egyptian Highway Network, 1992, b) Upper Egypt

study. The letter A denotes a link passing through agriculture area, D denotes a link passing through a desert area, and U denotes a link passing through an urban area.

Column 6: road type according the study of transport on Egyptian highway networks. The coding is as follows:

Road type	Main route from Cairo	Other Main routes	Others
Divided(one-way)	11	12	13
Dual(two-way)	21	22	23

Column 7: link length (km). The basis of the link length is data provided by the district engineers. However, cross-checks have been made against measurements from survey maps 1:100,000, together with comparisons with link lengths provided in the road transport study. These checks were necessary, as very often the length of the arc between two cities is not totally under the jurisdiction of RBA, and has to be divided into several links.

Columns 8&9: section start and section end km. Some of the links are divided into several homogeneous section as a basis for pavement condition and geometrical characteristics. In these cases, the link length in column 7 is repeated in all records related to the same link, together with section start and section end for each section of the same link.

Column 10: carriageway width in meter. Carriageway width given in column 10 is according to districts engineers measurements.

Column 11: carriageway width in meter. The carriageway width given in column 11 is according to the road transport study. The figures are based on records from the RBA files of central administration.

Columns 12,13,14&15: shoulder width (m) and type. The letter E and P in column 13 refer to earth and paved shoulder surfacing, while the figures 1,2,&3 in column 15 refer to paved, earth, and (paved+earth) shoulder surfacing respectively.

Column 16: median strip width (m). The figure given is the average width measured all over the link in the road transport study.

Column 17:the average curvature on the link.

Column 18: Average daily traffic in vehicles. The figure given in this column is the estimate of the district engineer by the end of 1991 and the beginning of 1992.

Table 4-1-2 Sample of Road Inventory Data Relevant to Network Operational Characteristics.

INNODE CODE	OUTNODE CODE	LINK NAME	DSTR. CODE	ROAD TYPE	ROAD TYPE **	LINK LENGTH	SEC. START	SEC. END	CARRAIGEWAY WIDTH	CARRAIGEWAY WIDTH **	SHOULDER WIDTH	SHOULDER TYPE	SOULDER WIDTH **	SOULDER TYPE **	MEDIAN STRIP **	CURVATURE **	ADT (VEHICLE)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
3232	2106	EL-DAKHLA TO BAHARIA OASIS	A	D	0	500.00	230.0	300.0	6.0	0.00	2	E	0.00	0	0.00	0.00	
3232	2106	EL-DAKHLA TO BAHARIA OASIS	A	D	0	500.00	50.0	80.0	6.0	0.00	2	E	0.00	0	0.00	0.00	
3232	2106	EL-DAKHLA TO BAHARIA OASIS	A	D	0	500.00	80.0	160.0	6.0	0.00	2	E	0.00	0	0.00	0.00	
3232	2106	EL-DAKHLA TO BAHARIA OASIS	A	D	0	500.00	160.0	230.0	6.0	0.00	2	E	0.00	0	0.00	0.00	
3232	2106	EL-DAKHLA TO BAHARIA OASIS	A	D	0	500.00	300.0	500.0	7.5	0.00	0	?	0.00	0	0.00	0.00	
3232	2106	EL-DAKHLA TO BAHARIA OASIS	A	D	0	500.00	0.0	50.0	6.0	0.00	2	E	0.00	0	0.00	0.00	
2502	2501	QOSSIAH TO DAIRUT	A	D	12	12.00	0.0	12.0	7.5	7.50	3	E	1.36	2	0.00	2.80	4000.0
2503	2502	MANFALOT TO QOSSIAH	A	D	12	20.00	0.0	20.0	7.5	7.50	3	E	2.50	2	0.00	7.04	4000.0
2543	2503	MNKABAD TO MANFALOT	A	D	12	22.00	0.0	22.0	7.5	15.00	3	E	2.36	2	1.40	1.35	4000.0
2594	2505	ASYUT TO ABU TIG	A	D	22	25.00	0.0	25.0	7.5	8.28	3	E	2.04	1	0.00	9.98	3000.0
2505	2506	ABU TIG TO SEDFA	A	D	22	12.00	5.0	12.0	7.5	7.11	3	E	1.97	2	0.00	12.67	3000.0
2505	2506	ABU TIG TO SEDFA	A	D	22	12.00	0.0	5.0	7.5	7.11	3	E	1.97	2	0.00	12.67	3000.0
2606	2644	AKHMIM TO EL HAWAWISH	A		22	5.00	0.0	0.0	0.0	7.07	0		1.97	2	0.00	0.00	
2608	2644	DAR EL SALAM TO EL HAWAWISH	A	A	22	47.00	16.0	20.0	7.5	7.29	3	E	0.00	0	0.00	0.00	
2608	2644	DAR EL SALAM TO EL HAWAWISH	A	A	22	47.00	20.0	47.0	7.5	7.29	3	E	0.00	0	0.00	0.00	
2605	2645	SOHAG TO MINSHAH CON.	A	A	22	15.00	0.0	10.0	7.5	7.50	1.5	P	2.33	1	0.00	0.00	
2609	2645	EL MINSHAH TO MINSHAH CON.	A		22	6.00	0.0	0.0	0.0	7.50	0		2.33	1	0.00	0.00	
2605	2645	SOHAG TO MINSHAH CON.	A	A	22	15.00	10.0	15.0	7.5	7.50	1.5	P	2.33	1	0.00	0.00	
2604	2646	GIHEINA TO GIHEINA CON.	A		22	11.00	0.0	0.0	0.0	6.74	0		1.86	2	0.00	0.00	
1548	1501	SKHA TO KAFR EL SHEIKH	M	A	22	4.00	0.0	4.0	7.5	7.21	1.7	P	1.99	1	0.00	5.75	
1644	1502	EL SHEEN TO QELLIN	M		22	8.00	0.0	0.0	0.0	6.55	0		3.67	2	0.00		
1503	1504	DESOUK TO FOUH	M	A	22	15.00	0.0	15.0	6.0	6.74	1.5	P	2.00	1	0.00	4.15	
3102	3101	HURGHADA TO RAS GHARB	R	D	22	148.00	30.0	40.0	7.5	7.58	3	E	5.93	2	0.00	0.00	
3102	3101	HURGHADA TO RAS GHARB	R	D	22	148.00	0.0	10.0	7.5	7.58	3	E	5.93	2	0.00	0.00	
3541	3507	RAS NASRANY TO DAHAB	S	D	0	100.00	0.0	100.0	6.0	0.00	2	E	0.00	0	0.00	0.00	30.0
3545	3508	NAFAREK DAH/NEWAB. TO NEWAIBAI	S	D	0	35.00	0.0	35.0	6.0	0.00	3	E	0.00	0	0.00	0.00	35.0
1204	1208	TALKHA BR.	I		0	2.50	0.0	0.0	0.0	0.00	0		0.00	0	0.00	0.00	
1402	1443	EL QANATER EL KHAIRIA	I		2	1.60	0.0	0.0	0.0	7.75	0		0.00	0	0.00	0.00	
1401	136	SHUBRA EL KHEIMA TO MOSTOROD	L		22	7.50	0.0	0.0	0.0	0.00	0		0.00	0	0.00	0.00	
136	137	MOSTOROD TO EL MARG	L		0	3.30	0.0	0.0	0.0	0.00	0		0.00	0	0.00	0.00	

** INDICATES THAT THE SOURSE OF THE DATA IS 'THE STUDY OF TRANSPORT ON EGYPTIAN HIGHWAY NETWORKS'
FOR COMPLETE SET OF DATA REFER TO THE FILE 'TABLE6-3' DOCUMENTED IN THE COMPUTERIZED PROJECT WORKING FILES.

4.1.8 Highway Network Furniture Data

As mentioned in the previous section, also data about highway furniture has been compiled from data collected by the highway districts engineers and from previous studies. Table 4-1-3 presents a sample of the data compiled. For the complete data set about the whole network, refer to the file "INV?.LST" found in projects computerized working files. Following are short explanation about the items entered in this table:

Columns 1 to 6: As columns 1 to 3 and columns 7 to 9 of Table 4-1-2 explained above.

Columns 7&8: road lining condition at the center of the road. In case of the data collected by the districts engineers; i.e. column 7, G means good condition of the lining, F means fair, P means poor, and N means non-existence of road lining. In case of the data collected in the road transport study; i.e. column 8, the figure 1 means good condition of the road lining, 2 means poor condition, while 0 means the non-existence of the road lining.

Columns 9&10: road lining condition at the edges of the

road. The symbols for road lining condition are the same as given in columns 7&8.

Columns 11&12: number of culverts beneath the road link.

Columns 13&14: number of traffic signs on the link.

Column 15: number of signal sets on the link.

Column 16: number of street lighting posts on the link.

Column 17&18: the longitudinal length of the road on both sides, in kilometers, which needs slope stabilization works.

column 19&20: the longitudinal length of the road on both sides, in kilometers, which needs vegetation control.

Table 4-1-3 Sample of Road Inventory Data Relevant to Highway Furniture.

INNODE CODE	OUTNODE CODE	LINK NAME	LINK LENGTH (km)	SEC. START (km)	SEC. END (km)	ROAD LIN. CENTER		ROAD LINING EDGE		CULVERTS		TRAF. SIGNS		SIGNAL SETS	STREET LIGHTING	SLOPE CONTROL	SLOPE CONTROL (km)	VEGET. CONTROL (km)	VEGET. CONTROL (km)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	** (8)	(9)	** (10)	(11)	** (12)	(13)	** (14)	(15)	(16)	(17)	** (18)	(19)	** (20)
2502	2591	QOSSIAH TO DAIRUT	12.0	0.0	12.0	F	2 F		2	4	2.0	75	45	2	60	2.0	0.00	0.000	0.000
2503	2502	MANFALOT TO QOSSIAH	20.0	0.0	20.0	F	2 F		2	8	0.0	111	71	0	120	4.0	0.00	0.500	0.500
2504	2505	ASYUT TO ABU TIG	25.0	0.0	25.0	F	1 F		1	10	2.0	200	129	0	160	5.5	0.00	0.000	0.000
2504	2507	ASYUT TO GHANAIM	45.0	0.0	15.0	N	0 N		0	1	0.0	75	0	0	0	7.0	0.00	0.000	0.000
2504	2507	ASYUT TO GHANAIM	0.0	15.0	30.0	N	0 N		0	0	0.0	75	0	0	0	7.0	0.00	0.000	0.000
2504	2507	ASYUT TO GHANAIM	0.0	30.0	45.0	N	0 N		0	0	0.0	56	0	0	0	6.0	0.00	0.000	0.000
2504	2543	ASYUT TO MANKABAD	8.0	0.0	8.0	F	0 F		0	0	0.0	20	0	2	200	2.0	0.00	0.000	0.000
2505	2506	ABU TIG TO SEDFA	12.0	0.0	5.0	F	1 F		1	6	0.0	17	48	0	34	0.5	0.00	0.000	0.000
2505	2506	ABU TIG TO SEDFA	0.0	5.0	12.0	F	1 F		1	4	0.0	50	48	0	30	1.0	0.00	0.000	0.000
2506	2601	SEDFA TO TEMA	8.0	0.0	8.0	F	1 F		2	4	1.0	61	44	0	33	1.0	0.00	0.000	0.000
2508	2510	EL-SAHEL TO BADARI	10.0	0.0	10.0	F	0 F		0	2	0.0	56	0	0	2	1.5	0.00	0.000	0.000
2509	2542	ABNOUB TO QANATER ASYUT	10.0	0.0	10.0	F	0 F		0	2	0.0	56	0	0	3	2.0	0.00	0.000	0.000
2510	2607	BADARI TO SUKOLTA	44.0	0.0	0.0	?	2 ?		2	0	3.0	0	124	0	0	0.0	1.50	11.200	11.200
2542	2508	QANATER ASYUT TO EL-SAHEL	25.0	0.0	15.0	F	0 F		0	3	0.0	84	0	0	4	2.0	0.00	0.000	0.000
2542	2508	QANATER ASYUT TO EL-SAHEL	0.0	15.0	25.0	F	0 F		0	1	0.0	56	0	0	3	1.5	0.00	0.000	0.000
2543	2503	MNKABAD TO MANFALOT	22.0	0.0	22.0	F	0 F		0	8	0.0	124	0	0	120	4.0	0.00	0.000	0.000
2543	3201	MNKABAD TO NEW VALLEY	225.0	0.0	13.0	P	0 P		0	4	0.0	60	0	2	0	1.0	0.00	0.000	0.000
2543	3201	MNKABAD TO NEW VALLEY	0.0	13.0	93.0	F	0 F		0	0	0.0	96	0	0	0	0.0	0.00	0.000	0.000
2543	3201	MNKABAD TO NEW VALLEY	0.0	93.0	166.0	P	0 P		0	0	0.0	115	0	0	0	0.0	0.00	0.000	0.000
2543	3201	MNKABAD TO NEW VALLEY	0.0	166.0	225.0	F	0 F		0	2	0.0	85	0	2	0	1.0	0.00	0.000	0.000
2601	2602	TEMA TO TAHTA	15.0	0.0	15.0	F	2 F		2	6	2.0	48	75	0	53	3.0	0.00	0.000	0.000
2602	2646	TAHTA TO GIHSINA CON.	7.0	0.0	7.0	F	0 F		0	3	0.0	22	0	0	25	1.5	0.00	0.000	0.000
2603	2605	MARAGHA TO SOHAG	18.0	0.0	3.0	F	2 F		2	1	1.0	10	27	0	5	0.5	2.00	0.000	0.000
2603	2605	MARAGHA TO SOHAG	0.0	3.0	18.0	F	2 F		2	8	1.0	48	27	0	54	4.0	2.00	0.000	0.000
2605	2645	SOHAG TO MINSHAH CON.	15.0	0.0	10.0	F	0 F		0	2	0.0	25	0	0	35	2.0	0.00	0.000	0.000
2605	2645	SOHAG TO MINSHAH CON.	0.0	10.0	15.0	F	0 F		0	2	0.0	13	0	0	18	1.0	0.00	0.000	0.000
2608	2644	DAR EL SALAM TO EL HAWAWISH	47.0	0.0	6.0	F	0 F		0	0	0.0	39	0	0	200	1.0	0.00	0.000	0.000
2608	2644	DAR EL SALAM TO EL HAWAWISH	0.0	6.0	16.0	N	0 N		0	0	0.0	12	0	0	0	3.0	0.00	0.000	0.000
2608	2644	DAR EL SALAM TO EL HAWAWISH	0.0	16.0	20.0	N	0 N		0	2	0.0	6	0	0	0	0.0	0.00	0.000	0.000
2608	2644	DAR EL SALAM TO EL HAWAWISH	0.0	20.0	47.0	N	0 N		0	3	0.0	18	0	0	185	0.0	0.00	0.000	0.000
2610	2611	GERGA TO EL BALYANA	16.0	0.0	10.0	F	2 F		2	3	4.0	28	25	0	40	2.0	0.00	0.000	0.000
2610	2611	GERGA TO EL BALYANA	0.0	10.0	16.0	F	2 F		2	1	4.0	16	25	0	22	1.0	0.00	0.000	0.000
2611	2643	EL BALYANA TO ABU SHOSHA	6.0	0.0	6.0	F	0 F		0	2	0.0	16	0	0	21	1.0	0.00	0.000	0.000
2644	2607	EL HAWAWISH TO SUKOLTA	16.0	0.0	3.0	N	0 N		0	1	0.0	2	0	0	15	0.0	0.00	0.000	0.000
2644	2607	EL HAWAWISH TO SUKOLTA	0.0	3.0	16.0	N	0 N		0	3	0.0	26	0	0	400	0.0	0.00	0.000	0.000
2645	2610	MINSHAH CON. TO GERGA	20.0	0.0	15.0	F	0 F		0	5	0.0	38	0	0	52	2.5	0.00	0.000	0.000
2645	2610	MINSHAH CON. TO GERGA	0.0	15.0	20.0	F	0 F		0	1	0.0	9	0	0	12	0.5	0.00	0.000	0.000
2646	2603	GIHSINA CON. TO MARAGHA	5.0	0.0	5.0	F	0 F		0	2	0.0	16	0	0	23	1.0	0.00	0.000	0.000

** INDICATES THAT THE SOURSE OF THE DATA IS 'THE STUDY OF TRANSPORT ON EGYPTIAN HIGHWAY NETWORKS'
FOR COMPLETE SET OF DATA REFER TO THE FILE 'TABLE6-3' DOCUMENTED IN THE COMPUTERIZED PROJECT WORKING FILES.

4.1.9 Highway Network Pavement Condition Data

Data have been compiled also by the Study team from districts engineers and previous studies about pavement condition of the different links of the inter city highway network. Table 4-1-4 presents a sample of the data items relevant to pavement condition. For the complete set of data, refer to the files "ASS?.LST" in the project computerized

working files. Following is the explanation of the different entries of this table:

Columns 1 to 6: these columns are similar to columns 1 to 3 & 7 to 9 of Table 4-1-2.

Column 7: the general shape of pavement surface. This type of pavement condition characteristics is given three grades; 1, 2 & 3. Grade "1" means that the general shape of pavement surface is very good and is approximately similar to the shape of the surface as newly constructed. Grade "1" means that the pavement surface is free from corrugations and depressions and drivers do not need to reduce their vehicle speeds and can run with the design speed of the highway. Grade "3" means that pavement surface condition is poor and heavily corrugated, and driving condition is difficult, and vehicle speeds has to be reduced to maintain comfort for the passengers and safety of the goods. Grade "2" is given when the shape of pavement surface is between the conditions explained for grades "1" and "3".

Column 8: pavement surface texture condition. The surface texture condition is determined by observing the surface of the road while driving ,and stopping the observing vehicle to test the texture closely, if required. Three grades for surface texture condition have been determined. These are grades 1, 2, and 3. Grade "1" means that the pavement has a higher asphalt content than the normal ratio,and bleeding is expected in summer months. Such highway sections need spraying of fine aggregates and then compaction. Grade "2" means that the surface texture is normal and accepted, and needs no treatment. Grade "3" is given to pavement sections which starts to loose fine surface particle due to insufficient pavement asphalt content. These sections are proposed for surface dressing treatment.

Column 9 :pavement edge condition with respect to fretting. Edge fretting occurs when highway shoulder has lost a considerable part of its soil or does not exists at all. Irregularities and deterioration of the pavement edges for a depth more than 30 cm indicates edge fretting. The column field includes the length of the fretted edges on both sides of the paved carriageway in kilometers for the whole highway section.

Column 10: longitudinal cracking. Pavement cracking has been classified in the RBA highway maintenance management project only into three types; i.e. longitudinal, reflective, and alligator cracking. The longitudinal cracking is measured as the length of single cracks in kilometers found in the total length of the carriageway in the highway section.

Column 11: reflective cracking. The figure in the column indicates the length of the cracks in kilometers within the carriageway of the link section.

Column 12: alligator cracking. The figure in the column indicates the total area in square meters of the

cracked regions within the carriageway of the link section.

Column 13: potholes. The figure in the column gives the area of potholes in meter square found in the carriageway of the link section.

Column 14: rutting. The figures in the column indicates the total lengths under the wheels in kilometers having rutting. the measurement has to be done separately for each traveling lane.

Column 15: percentage of old patching. The figure in the column indicates the percentage of the total area of the carriageway which have been patched.

Column 16: plastic failure, and is defined as corrugation and pavement shoving. The figure in the column is given in kilometers of the length within the carriageway having this defect type.

Columns 17 to 22: pavement condition according to Pavement Condition Index (PCI) rating method. The rating of the pavement is as follows:

Value Of PCI	Rating
100 - 86	Excellent
85 - 71	Very Good
70 - 56	Good
55 - 41	Fair
40 - 26	Poor
25 - 11	Very Poor
10 - 0	Failed.

The values given in these columns are as measured and calculated from the surveys done within the framework of "The Study of Transport on Egyptian Highway Network" and "The Effect of Axle Loads on Egyptian Inter city Highway Pavement".

Column 23: shoulder low. The column includes the lengths in kilometers of the shoulders on both sides lower than the pavement level with more than 5 centimeters, which leaves the carriageway pavement unprotected.

Column 24: shoulder condition according to road transport study. The figure 1 indicates good condition,2 indicates fair condition, and 3 indicates poor condition.

Column 25&26: type and level of water channels on both sides of highway link. The figure 1 indicates that the waterway exists on the right side, 2 indicates that the water channel is on the left side, and 3 indicates that the water channels are on both sides of the highway. The difference in level between the carriageway surface and the water level is given in meters in column 26.

Columns 27 to 31: last maintenance activity done on the highway link. The activity type code, date of implementation,whether the activity includes a base and a

surface coarse,and the total cost are given in the relevant columns.

Table 4-1-4 Sample of Road Inventory Data Relevant to Highway Pavement Condition (1)

INNODE	OUTNODE	LINK NAME	LINK LENGTH	SECT START	SECT END	SHAPE	TEXTURE	EDGE BRKN.	LONGTUDINAL CRACKING	REFLECTIVE CRACKING	ALLIGATOR CRACKING	POTHLES	RUTTING	% OLD PATCHING	PLASTIC FAILURE
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
1102	1145	DAMIETTA TO EL DEKBA	29.0	0.0	7.0	2	2	0.0	0.00	0.00 Km*	Sq.m	0.0	1.00	0.0	1.00
1102	1145	DAMIETTA TO EL DEKBA	0.0	7.0	29.0	2	2	0.0	0.00	0.00 Km	0.00 Sq.m	0.0	0.00	0.0	0.00
1103	1102	FARASKOUR TO DAMIETTA	14.0	0.0	2.0	2	2	0.0	0.00	0.00 Km	0.00 Sq.m	0.0	0.00	0.0	0.00
1103	1102	FARASKOUR TO DAMIETTA	0.0	2.0	9.0	2	2	0.0	0.00	0.00 Km	0.00 Sq.m	0.0	0.00	0.0	0.00
1103	1102	FARASKOUR TO DAMIETTA	0.0	9.0	14.0	2	1	0.0	0.00	0.00 Km	0.00 Sq.m	0.0	0.00	0.0	0.30
1104	1139	EL ZARQA TO EL-BRASHIA	8.0	0.0	8.0	2	2	2.0	3.50	1.00 Km6	0.00 Sq.m	300.0	2.00	3.0	0.70
1138	1137	NEW DAMITTA TO KAFR EL-BATIEKH	6.3	0.0	6.3	2	2	0.0	0.00	0.00 Km	900.00 Sq.m	0.0	0.00	0.0	0.00
1137	1101	KAFR EL-BATIEKH TO KAFR SAAD	10.0	0.0	3.0	2	2	0.0	0.30	0.00 Km	800.00 Sq.m	0.0	0.00	0.0	0.00
1137	1101	KAFR EL-BATIEKH TO KAFR SAAD	0.0	3.0	8.0	2	2	0.0	0.00	0.00 Km	0.00 Sq.m	0.0	0.00	0.0	0.00
1137	1101	KAFR EL-BATIEKH TO KAFR SAAD	0.0	8.0	10.0	2	1	0.0	0.00	0.00 Km	0.00 Sq.m	0.0	0.00	0.0	0.00
1137	1136	KAFR EL-BATIEKH TO NEW DEMITTA	6.3	0.0	6.3	2	2	0.0	0.00	0.00 Km	500.00 Sq.m	0.0	0.00	0.0	0.00
1137	1138	KAFR EL-BATIEKH TO EL-SNANIA	3.0	0.0	2.0	2	2	0.0	0.60	0.00 Km1	200.00 Sq.m	0.0	0.00	0.0	0.00
1137	1138	KAFR EL-BATIEKH TO EL-SNANIA	0.0	2.0	3.0	2	1	0.0	0.30	0.00 Km	200.00 Sq.m	0.0	0.00	1.0	0.20
1138	1102	EL-SNANIA TO DAMIETTA	2.0	0.0	2.0	2	1	0.0	0.40	0.00 Km	600.00 Sq.m	0.0	0.00	1.0	0.30
1138	1137	EL-SNANIA TO KAFR EL-BATIEKH	3.0	0.0	1.0	2	1	0.0	0.10	0.00 Km	700.00 Sq.m	0.0	0.00	0.0	0.30
1138	1137	EL-SNANIA TO KAFR EL-BATIEKH	0.0	1.0	3.0	2	2	0.0	0.20	0.70 Km	0.00 Sq.m	0.0	0.00	0.0	0.00
1138	1140	EL-SNANIA TO RAS EL-BAR(1)	12.0	0.0	10.0	3	3	2.0	4.00	1.00 Km*	Sq.m	50.0	1.00	0.0	0.40
1138	1140	EL-SNANIA TO RAS EL-BAR(1)	0.0	10.0	12.0	3	3	0.0	2.00	0.50 Km6	0.00 Sq.m	0.0	0.00	0.0	0.00
1139	1103	EL-BRASHIA TO FARASKOUR	8.0	0.0	8.0	2	2	0.0	0.00	0.00 Km1	500.00 Sq.m	0.0	0.00	0.0	0.00
1201	1202	MIT GHAMR TO AGA	26.0	0.0	26.0	2	2	2.0	6.00	0.00 Km	0.30 Km.	30.0	5.00	0.0	0.20
1201	1456	MIT GHAMR TO D.B.BENHA-M.GHAMR	17.0	0.0	17.0	2	2	3.5	25.00	6.00 Km	5.00 Km.	200.0	5.00	0.0	2.00
1202	1254	AGA TO SANDOUB	13.0	0.0	1.0	1	2	0.0	0.00	0.00 Km1	500.00 Sq.m	0.0	0.00	5.0	0.02
1202	1254	AGA TO SANDOUB	0.0	1.0	13.0	1	2	0.0	0.30	0.00 Km	300.00 Sq.m	0.0	0.00	0.0	0.04
1203	1254	SENBELLAWEN TO SANDOUB	18.0	0.0	2.0	2	2	0.0	0.00	0.00 Km	0.00 Sq.m	0.0	0.00	0.0	0.00
1203	1254	SENBELLAWEN TO SANDOUB	0.0	2.0	18.0	2	2	0.0	2.00	0.00 Km5	0.00 Sq.m	0.0	1.00	0.0	0.20
1205	1211	DEKERNES TO MENYET EL NASR	6.0	0.0	3.0	3	3	0.6	0.20	0.15 Km	0.20 Km.	100.0	0.00	0.0	0.10
1205	1211	DEKERNES TO MENYET EL NASR	0.0	3.0	6.0	3	3	0.0	0.10	0.00 Km	0.24 Km.	0.0	0.00	0.0	0.00
1205	1243	DEKERNES TO MEHALET INSHAQ	11.7	0.0	11.7	1	2	0.0	0.00	0.00 Km	0.00 Sq.m	0.0	0.00	0.0	0.01
1206	1250	MANZALA TO EL-HOTTA	5.5	0.0	5.5	3	3	0.0	0.00	0.00 Km2	0.00 Sq.m	200.0	0.20	0.0	0.00
1208	1209	TALKHA TO BELKAS	18.0	0.0	1.5	2	2	0.0	0.00	0.00 Km	0.00 Sq.m	2.0	0.00	0.0	0.00
1208	1209	TALKHA TO BELKAS	0.0	1.5	8.5	1	2	0.0	0.15	0.00 Km	0.00 Sq.m	0.0	0.00	0.0	0.00
1208	1209	TALKHA TO BELKAS	0.0	8.5	17.0	1	2	0.0	0.20	0.20 Km	0.00 Sq.m	0.0	0.00	0.0	0.00
1208	1209	TALKHA TO BELKAS	0.0	17.0	18.0	1	2	0.0	0.00	0.00 Km	0.00 Sq.m	300.0	0.00	3.0	0.02
1304	1316	ZAGAZIG TO QANAYAT	6.0	0.0	4.0	1	2	0.0	0.00	0.00 Km	0.00 Sq.m	0.0	0.00	0.0	0.00
1304	1316	ZAGAZIG TO QANAYAT	0.0	4.0	6.0	1	2	0.0	0.00	0.00 Km	0.00 Sq.m	0.0	0.00	0.0	0.00

** INDICATES THAT THE SOURCE OF DATA IS ' THE STUDY OF TRANSPORT ON EGYPTIAN HIGHWAY NETWORK'.
FOR COMPLETE SET OF DATA, REFER TO FILE 'TABLE 6-4' DOCUMENTED IN THE COMPUTERIZED PROJECT WORKING FILES. PLEASE

Table 4-1-4 Sample of Road Inventory Data Relevant to Highway Pavement Condition (2)

INNODE	OUTNODE	LINK NAME	PAVEMENT CONDITION						SHOULDER LOW	SHOULDER COND.	WATER CHANNEL TYPE	WATER CHANNEL LEVEL	LAST MAINTENANCE ACTIVITY	LAST MAINTENANCE DATE	LAST MAINTENANCE BASE	LAST MAINTENANCE SURFACE	TOTAL COST
			EXL. **	V. GOOD **	GOOD **	FAIR **	POOR **	FAILED **		**	**	**	**	**	**	**	**
(1)	(2)	(3)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)
1102	1145	DAMIETTA TO EL DEKBA	0.00	13.00	38.00	25.00	24.00	0.00	0.0	1	0	0.00	0	1968	0	0	499904.0
1102	1145	DAMIETTA TO EL DEKBA	0.00	13.00	38.00	25.00	24.00	0.00	3.0	1	0	0.00	0	1968	0	0	499904.0
1103	1102	FARASKOUR TO DAMIETTA	0.00	0.00	0.00	75.00	25.00	0.00	0.0	1	3	3.16	53	1985	25	10	4500000.0
1103	1102	FARASKOUR TO DAMIETTA	0.00	0.00	0.00	75.00	25.00	0.00	3.0	1	3	3.16	53	1985	25	10	4500000.0
1103	1102	FARASKOUR TO DAMIETTA	0.00	0.00	0.00	75.00	25.00	0.00	1.0	1	3	3.16	53	1985	25	10	4500000.0
1104	1139	EL ZARQA TO EL-BRASHIA	0.00	0.00	27.00	33.00	40.00	0.00	6.0	2	3	3.45	510	1985	25	11	2784302.0
1136	1137	NEW DAMITTA TO KAFR EL-BATIEKH	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0	0	0.00	0	0	0	0	0.0
1137	1101	KAFR EL-BATIEKH TO KAFR SAAD	22.00	45.00	33.00	0.00	0.00	0.00	2.0	1	3	2.82	56	1986	15	11	4342105.0
1137	1101	KAFR EL-BATIEKH TO KAFR SAAD	22.00	45.00	33.00	0.00	0.00	0.00	3.0	1	3	2.82	56	1986	15	11	4342105.0
1137	1101	KAFR EL-BATIEKH TO KAFR SAAD	22.00	45.00	33.00	0.00	0.00	0.00	0.0	1	3	2.82	56	1986	15	11	4342105.0
1137	1135	KAFR EL-BATIEKH TO NEW DEMITTA	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0	0	0.00	0	0	0	0	0.0
1137	1138	KAFR EL-BATIEKH TO EL-SNANIA	22.00	45.00	33.00	0.00	0.00	0.00	0.0	1	3	2.82	56	1986	15	11	4342105.0
1137	1138	KAFR EL-BATIEKH TO EL-SNANIA	22.00	45.00	33.00	0.00	0.00	0.00	0.0	1	3	2.82	56	1986	15	11	4342105.0
1138	1102	EL-SNANIA TO DAMIETTA	22.00	45.00	33.00	0.00	0.00	0.00	0.0	1	3	2.82	56	1986	15	11	4342105.0
1138	1137	EL-SNANIA TO KAFR EL-BATIEKH	22.00	45.00	33.00	0.00	0.00	0.00	0.0	1	3	2.82	56	1986	15	11	4342105.0
1138	1137	EL-SNANIA TO KAFR EL-BATIEKH	22.00	45.00	33.00	0.00	0.00	0.00	2.0	1	3	2.82	56	1986	15	11	4342105.0
1138	1140	EL-SNANIA TO RAS EL-BAR(1)	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0	0	0.00	0	0	0	0	0.0
1138	1140	EL-SNANIA TO RAS EL-BAR(1)	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0	0	0.00	0	0	0	0	0.0
1139	1103	EL-BRASHIA TO FARASKOUR	0.00	0.00	27.00	33.00	40.00	0.00	2.0	2	3	3.45	510	1985	25	11	2784302.0
1201	1202	MIT GHAMR TO AGA	0.00	0.00	42.90	7.10	50.00	0.00	0.7	1	1	2.47	59	1987	15	12	2531422.0
1201	1456	MIT GHAMR TO D.B.BENHA-M.GHAMR	0.00	0.00	29.00	13.00	58.00	0.00	4.0	1	1	2.55	52	1985	15	12	1761029.0
1202	1254	AGA TO SANDOUB	7.00	18.00	14.00	32.00	29.00	0.00	0.0	2	3	2.69	54	1986	0	0	127960.0
1202	1254	AGA TO SANDOUB	7.00	18.00	14.00	32.00	29.00	0.00	0.0	2	3	2.69	54	1986	0	0	127960.0
1203	1254	SENBELLAWEN TO SANDOUB	0.00	0.00	25.00	50.00	25.00	0.00	0.0	2	3	3.18	52	1988	15	10	2543700.0
1203	1254	SENBELLAWEN TO SANDOUB	0.00	0.00	25.00	50.00	25.00	0.00	0.0	2	3	3.18	52	1988	15	10	2543700.0
1205	1211	DEKERNES TO MENYET EL NASR	0.00	0.00	13.30	13.30	66.70	0.00	0.8	1	3	2.58	53	1984	20	11	2868905.0
1205	1211	DEKERNES TO MENYET EL NASR	0.00	0.00	13.30	13.30	66.70	0.00	0.0	1	3	2.58	53	1984	20	11	2868905.0
1205	1243	DEKERNES TO MEHALET INSHAQ	0.00	0.00	0.00	0.00	0.00	0.00	0.4	0	0	0.00	53	0	0	0	1350000.0
1206	1250	MANZALA TO EL-HOTTA	0.00	11.00	22.00	33.00	33.00	0.00	2.0	2	2	3.05	53	1987	15	11	450797.0
1208	1209	TALKHA TO BELKAS	0.00	20.00	80.00	0.00	0.00	0.00	0.0	1	3	2.56	53	1987	15	10	831080.0
1208	1209	TALKHA TO BELKAS	0.00	20.00	80.00	0.00	0.00	0.00	0.8	1	3	2.56	53	1987	15	10	831080.0
1208	1209	TALKHA TO BELKAS	0.00	20.00	80.00	0.00	0.00	0.00	0.6	1	3	2.56	53	1987	15	10	831080.0
1208	1209	TALKHA TO BELKAS	0.00	20.00	80.00	0.00	0.00	0.00	0.0	1	3	2.56	53	1987	15	10	831080.0
1304	1316	ZAGAZIG TO QANAYAT	0.00	0.00	10.00	10.00	80.00	0.00	0.0	2	0	0.00	53	1984	0	11	110514.6
1304	1316	ZAGAZIG TO QANAYAT	0.00	0.00	10.00	10.00	80.00	0.00	0.0	2	0	0.00	53	1984	0	11	110514.6

** INDICATES THAT THE SOURCE OF DATA IS ' THE STUDY OF TRANSPORT ON EGYPTIAN HIGHWAY NETWORK'.
FOR COMPLETE SET OF DATA, REFER TO FILE 'TASLE 6-4' DOCUMENTED IN THE COMPUTERIZED PROJECT WORKING FILES. PLEASE

4.1.10 JICA 1992 Sample Road Inventory

As has been shown in previous sections, several road inventory surveys had been carried out recently on the Egyptian inter city highway network. Different forms and approaches had been used. Also some differences among the results of these inventories have been recorded. For these reasons and others, the Study team carried out a sample road inventory. The objective of this sample survey is two folds. The first, is to establish a unified and comprehensive method for R.I. which could be repeated by districts engineers on annual basis for providing the basic data needed for road maintenance planning using the maintenance management system as well as highway planning. The second reason is to check the overall pavement condition of the inter city highway network by the year 1992.

The sample road inventory has been carried out by the Study team within the framework of the OD-Surveys. The road links having OD survey stations have been subject to comprehensive road inventory. Table 4-1-5 presents the name of the road and the innode and outnode codes (columns 1 to 4) of each link on which an OD survey station is located. Link

lengths, which have been subject to road inventory, are given in column 5. OD survey station code numbers according to previous national transport studies, and which have been followed also in the Study, are presented in column 6. Column 7 gives station code numbers according to the RBA Permanent Traffic Counting Program (PTC).

Table 4-1-5 Definition of Road Inventory Links(1)

ROAD BEGIN NAME	ROAD END NAME	IN-NODE	OUT-NODE	LINK LENGTH (Km)	STATION IDENTIF. ENTS II,III	STATION IDENTIF. PTC
1	2	3	4	5	6	7
GREATER CAIRO	SUEZ	10140	10449	134.0	1	4
TENTH OF RAMADAN	ISMAILIYA	11359	11938	64.0	2	1
ABU HAMMAD	EL TELL EL KEBIR	11353	11903	10.0	3	5
ABU ZAABAL	BELBES	11448	11302	27.0	4	7
MENYET EL KAMH	BENHA	11457	11303	22.0	5	109
KAFR SHOKR	MIT GHAMR	11456	11201	20.0	6	110
AGA	SAMANOUD	11215	11608	4.0	7	
SAMANOUD	TALKHA	11655	11208	17.0	8	9
BELKAS	KAFR EL-GRAIDA	11209	11541	8.0	9	119
BENHA	QUESNA	11407	11745	10.5	10	111
KANATER ELKHAIRIA	SENTRES	11402	11761	14.8	11	115
KAFR EL DAWAR	ALEXANDRIA	11810	10237	19.0	12	15
GIZA	SENNOURES	12154	12337	59.8	13	13
AIYAT	WASTA	12155	12201	32.0	14	3
SEDFA	TEMA	12506	12601	10.0	15	132
QENA	SAFAGA	12704	13103	160.0	16	135
ISMAILIYA	SALHIA CITY	11902	11312	32.0	18	
DAMIETTA	PORT SAID	11145	10300	69.0	19	107
MIT GHAMR	ZEFTA	11201	11601	3.0	23	113
TALKHA	TIYRA	11208	11244	21.0	24	
EL-QANATER EL-KH.WEST	EL-KHATATBA	11443	11846	42.0	26	136
WADI EL NATRON	JANAKLIS CONNECTION	11865	10234	48.0	27	125
ALEXANDRIA	ABU QUER	10200	10233	2.0	29	
MATROUH CONNECTION	ALAMEN	13309	10232	80.0	30	133
ALAMEN	EL AAMRIA	13309	13305	84.0	31	
SAFF	EL-KORIMAT	12108	12140	32.0	32	129
EL QANTARA	EL ARISH	11936	13402	156.0	33	137
SUEZ	TOR	10431	13503	210.0	34	140
NEW VALLEY	ASYUT	13201	12543	266.0	35	131
EL RAHMANIA	DAMANHOUR	11880	11503	2.0	36	123
KAFR EL ZAYAT	EL-TAWFIKIA	11604	11851	7.0	37	2
MAGHAGHA	BENI MAZAR	12241	12401	20.0	38	130
DAIR MOWAS	DAIRUT	12409	12501	12.0	39	14
EL BALYANA	ABU TESHT	12643	12701	8.0	40	100
ISNA	IDFU	12709	12801	52.0	41	101
TENTH OF RAMADAN	BELBES	11319	11302	24.0	50	
BENHA	ZEFTA	11745	11601	26.0	55	
BABEL	TANTA	11743	11642	10.0	59	114
FAYOUM	BENI SUEF	12303	12203	45.0	72	128

Table 4-1-5 Definition of Road Inventory Links(2)

ROAD BEGIN NAME	ROAD END NAME	IN-NODE	OUT-NODE	LINK LENGTH (Km)	STATION IDENTIF. ENTS II,III	STATION IDENTIF. PTC
1	2	3	4	5	6	7
PORT SAID	EL QANTARA	10332	11939	45.0	78	143
SUEZ	ZAAFARNA	10454	13136	120.0	102	134
GIZA	SADAT CITY	12153	11860	73.5	210	124
MIT GHAMR	AGA	11201	11640	28.0	212	11
MAADI	KATTAMIA	10142	10141	30.0	20	
IMBABA	KHATATTBA	12142	11846	10.0	21	
CAIRO	KANATER EL KHAIRIA	11403	11406	10.0	22	
QALAG ROAD		10137	11404	15.0	51	
MOAHAHDA ROAD		10136	11444	15.0	52	
ALEXANDRIA	KAFR EL DAWAR	10237	11810	20.0	28	
SUEZ	NAKHL	10435	13438	100.0	301	139
BENHA	ZEFTA	11745	11601	30.0	209	
BENHA	BAGOUR	11452	11745	16.0	25	
QENA	QUSEIR	12711	13104	100.0	211	
MENOUF	EL BRIGAT	11703	11744	12.0	42	
IDFINA	MOUTOBUS	11883	11505	5.0	43	
DEMO	MEYDOM	12201	12303	30.0	105	
EL FAYOUM	GERZA	12301	12155	20.0	73	
BERKET EL SABE	ZEFTA	11708	11639	20.0	57	
QUESNA	SANTA	11707	11639	18.0	56	
BERKET EL SABE	TANTA	11708	11603	25.0	58	
TALA	TANTA	11705	11603	14.0	60	
BELBES	EL HAIKSTEP	11302	10139	35.0	302	
TOTAL				2,654.6	62	

The links lengths which have been subjected to the inventory were estimated to be around 2,650 Km distributed over 62 links with no double count for divided highways. The inventory has been carried out during the second half of July 1992. The form consists of three pages. The heading of page (1) contains general information about date of the survey and name of surveyor, the link name, innode and outnode code numbers, whether the carriageway is dual (two-ways) or divided (one-way), and the area type through which the link passes. The upper part of the first page defines the number of homogeneous sections into which the link has to be divided, the kilometrage of the begin and end of each section, and the dimensions and area of the tested unit in each section. This upper part is repeated at the top of pages 2 & 3. The remainder part of page one, contains in principal, R.I. data over the entire length of the link relevant to the cross sections and the highway furniture. Carriageway and shoulder widths, shoulder type and condition, slope and vegetation control lengths, water channel characteristics, and lighting poles intervals have to be recorded in page one

for each homogeneous section separately. Other elements to be surveyed and reported all over the whole length of the link are given at the bottom part of page one. These are the number and types of culverts, the number and types of traffic signs, and guardrail and road marking condition.

Pages 2 & 3 contains all data items relevant to pavement condition characteristics. In case that the link contains more than one section, then pages 2 & 3 are repeated for each section. For the determination of the pavement condition, the adoption of the pavement condition index method was proposed, which developed by the United States Army, and which had been used by the RBA districts engineers in 1990 for the R.I. done in the framework of the study of the effect of axle load on pavement deterioration. The results of this sample R.I. will be reported together with the results of the data compiled from other surveys in the following sections.

4.1.11 Links Geometrical Characteristics

The geometrical characteristics of each link in the network are the main input for the determination of the link capacities and free flow speeds necessary for the traffic assignment process. As has been presented in Table 4-1-1 the network includes 104 routes which in turn contain 678 links. For the determination of the link geometrical characteristics, the data compiled in sections 4.1.7 and 4.1.10 was reviewed for the type of the link whether it is two-way or one-way, the carriageway width, the shoulder type and width, and the shoulder condition for each link in the network defined in the section 4.1.5. Contradiction between data obtained from the different sources have been checked and the correct value has been adopted. A file named LINKFILE has been created which includes the validated geometrical characteristics of all the links included in the inter city highway network. Table 4-1-6 presents a sample of the information found in the LINKFILE.

Table 4-1-6 Sample of the Data Included in the LINKFILE (1)

LK_COD	INNODE	OUTNODE	LK_NAM	DISTRICT	LK_LEN Km	LK_BEG Km	CAR WID	DIR	SHOULTYPE	SHOULWID	SHOUL COND
1	2	3	4	5	6	7	8	9	10	11	12
000101	5100	1401	CAIRO TO SHUBRA EL KHEIMA	L	10.0	0.0	10.5	0	P	2.00	F
000101	1401	5100	SHUBRA EL KHEIMA TO CAIRO	L	10.0	214.0	10.5	0	P	2.00	F
000102	1401	1403	SHUBRA EL KHEIMA TO QALYUB	C	10.0	10.0	10.5	0	P	2.00	F
000102	1403	1401	QALYUB TO SHUBRA EL KHEIMA	C	10.0	204.0	10.5	0	P	2.00	F
000103	1403	1406	QALYUB TO TOUKH	C	20.0	20.0	10.5	0	P	2.00	G
000103	1406	1403	TOUKH TO QALYUB	C	20.0	184.0	10.5	0	P	2.00	G

Table 4-1-6 Sample of the Data Included in the LINKFILE (2)

LK_COD	INNODE	OUTNODE	LK_NAM	DISTRICT	LK_LEN Km	LK_BEG Km	CAR WID	DIR	SHOULTYPE	SHOULWID	SHOUL COND
1	2	3	4	5	6	7	8	9	10	11	12
000104	1406	1407	BENHA TO TOUKH	C	13.0	40.0	10.5	0	P	2.00	F
000104	1407	1406	TOUKH TO BENHA	C	13.0	171.0	10.5	0	P	2.00	F
000117	1809	1810	ABU HOMMOS TO KAFR EL DAWAR	W	17.0	176.0	7.5	0	P	2.00	P
000117	1810	1809	KAFR EL DAWAR TO ABU HOMMOS	W	17.0	31.0	7.5	0	P	2.00	P
000118	0237	1810	ALEX. KM8 TO KAFR EL DAWAR	W	23.0	8.0	7.5	0	P	2.00	F
000118	1810	0237	KAFR EL DAWAR TO ALEX. KM8	W	23.0	193.0	7.5	0	P	2.00	F
000119	0200	0237	ALEX. TO KM8 ALEX¥CAIRO AGR.	L	8.0	0.0	7.5	0	P	2.00	F
000119	0237	0200	KM8 ALEX/CAIRO AGR. TO ALEX.	L	8.0	216.0	7.5	0	P	2.00	F
000201	5100	2103	CAIRO TO GIZA	L	10.0	0.0	10.5	0	P	2.00	G
000201	2103	5100	GIZA TO CAIRO	L	10.0	47.0	10.5	0	P	2.00	G
000202	2103	2104	GIZA TO BADRASHIN	C	20.0	10.0	7.5	0	P	2.00	G
000202	2104	2103	BADRASHIN TO GIZA	C	20.0	27.0	7.5	0	P	2.00	G
000203	2104	2105	BADRASHIN TO AIYAT	C	27.0	30.0	7.5	0	P	2.00	G
000203	2105	2104	AIYAT TO BADRASHIN	C	27.0	0.0	7.5	0	P	2.00	G
000204	2155	2105	GIRZA TO AIYAT	B	22.5	57.0	7.5	T	P	2.00	G
000205	2201	2155	WASTA TO GIRZA	B	10.5	79.5	7.5	T	P	2.00	G
000206	2202	2201	BUSH TO WASTA	B	22.0	90.0	7.5	T	P	2.00	G
000207	2203	2202	BENI SUEF TO BUSH	B	8.0	112.0	7.5	T	P	2.00	G
000208	2203	2205	BENI SUEF TO BEBA	B	20.0	120.0	7.5	T	P	2.00	G
000209	2205	2240	BEBA TO SIDS	B	6.0	140.0	7.5	T	P	2.00	G
000266	2802	2804	KOM OMBO TO ASWAN	Q	45.0	828.0	7.5	T	E	2.00	F
000267	2543	3201	MNKABAD TO NEW VALLEY(KHARGA)	A	225.0	353.0	7.5	T	P	2.00	P
000268	3201	3233	NEW VALLEY TO PARIS	A	90.0	578.0	6.0	T	E	2.00	F
000301	1444	5136	MASAKIN ABU ZAABAL TO MOSTOROD	C	19.0	0.0	6.0	T	P	2.00	F
000302	1448	1444	EZBT BATA TO MASAKIN ABU ZAAB.	C	2.0	19.0	6.0	T	P	2.00	F
000303	1302	1448	BELBES TO EZBT BATA	E	24.0	21.0	6.0	T	E	2.00	F
000304	1354	1302	EL-ABASSA TO BELBES	E	22.0	45.0	6.0	T	E	2.00	F
000305	1354	1353	EL-ABASSA TO EL-DAHRIA	E	3.5	67.0	6.0	T	E	2.00	F
000306	1903	1353	EL TELL EL KEBIR TO EL-DAHRIA	S	5.0	70.5	6.0	T	E	2.00	F
000307	1937	1903	EL-KASASEN TO EL TELL EL KEBIR	S	21.0	75.5	6.0	T	E	2.00	G
000308	1944	1937	KM112 CA/ISM.D. TO EL-KASASEN	S	22.0	96.5	6.0	T	E	2.00	G
000309	1902	1935	ISMAILIYA FERREY	I	3.0	118.5	0.0	T		0.00	
000310	1935	1953	EAST NO. 6(ISM.EAST) TO ELTASA	S	30.0	121.5	7.0	T	P	2.00	F
000311	1953	3440	EL TASAH TO BEIR EL-GIFGAFA	S	50.0	151.5	7.0	T	E	2.00	G
000312	3445	3440	BEIR HOMA TO BEIR EL-GIFGAFA	S	40.0	201.5	7.0	T	E	2.00	F
000313	3449	3445	MAFAREQ 156 ISM. TO BEIR HOMA	S	27.0	241.5	7.0	T	E	2.00	F
000314	3451	3449	MAFAREQ 161 ISM TO M.156 ISM.	S	4.0	268.5	6.0	T	E	2.00	F
000315	3443	3451	ABU AGELA TO MAFAREQ 161 ISM.	S	40.0	272.5	6.0	T	E	2.00	F
000316	3443	3442	ABU AGELA TO EL-AOGA	S	30.0	312.5	6.0	T	E	2.00	F

The first field in this file includes the link code. The link code consists of 6 digits, the first four from the left give the RBA route code which the link forms a part of it. The next two digits gives the serial number of the link on the route. For example, link number 000101 is the first link in route number 0001 (Cairo/Alexandria agric. road), and the route includes 19 links. Route number 0002 is the

Cairo/Aswan main highway with its branching to New Valley, and includes 68 links, from which the first 3 links are in a divided highway. The second and third fields in the file include the innode and outnode codes of the link. The name of the link is given in the fourth field. One-way links in divided highways are repeated twice in the link file, for example, the Cairo to Shubra El Kheiima link 5100-1401 is repeated directionally by the code 1401-5100. The code of the district responsible about the maintenance and the administration of the link is given in field number 5. Link length in kilometers is given in field 6. The kilometrage of the link beginning measured from the start of the route is given in field 7. Route kilometrage starts by zero from Cairo center and increases outbound from Cairo in all directions. Carriageway width in meters is given in field 8. Field 9 includes link direction usage code, where 0 indicates one-way links in four-lane or six-lane divided highways, and T indicates Two-way links in two-lane dual highways. Type of the shoulders are given in field 10. The letter P indicates paved shoulder, while the letter E indicates earth shoulders. Shoulder width in meters is given in field 11. Field 12 gives the shoulder pavement condition. The letter G indicates good, F fair, and P poor pavement conditions. The link file includes 678 links.

The total links lengths of the inter city highway network amounts to 15,880 Km. The distribution of the link lengths according to agencies responsible about the maintenance and operation of the link and the carriageway width have been deduced from the LINKFILE and are given in Fig. 4-1-4. Notation of the agency responsible about the link is given in the upper margin row, while the carriageway width is given in the margin left column. It is clear that divided 4-lane highways represent 21.66% of the total network. Six-lane divided highways represent 1.74% of the network, but two-third of the 6-lane divided highways are located in local governorates (mainly the Ring Road around Greater Cairo). The majority of the links are full dual two-way links having 7.5m carriageway width. A considerable portion of the network (27.68%) is a two-lane dual links with 6.0m carriageway, A normal practice now in RBA is to upgrade these links to full two-lane dual links having 7.5m carriageway when traffic volume justify the upgrading, and before upgrading to 4-lane divided highways.

Carraige-width,mt.	A	B	C	D	E	I	L	M	Q	R	S	T	W	Totals	Percen.
10.5 D	0	0	89	0	0	0	188	0	0	0	0	0	0	277	1.74%
7.5 D	0	94	370	0	278.2	18	305	223	0	0	501.8	411	1241	3442	21.66%
7.5	1621	285	518.5	65.5	369.5	19	291	137	1072	618	1737	115	412.2	7260.6	45.70%
7.0	0	0	0	0	19	0	0	44	0	0	298	0	0	361	2.27%
6.5	10	0	4	0	39.5	0	74.5	22	0	0	0	0	0	150	0.94%
6.0	145	221	48.4	172	253.1	25.1	707.4	415.5	296.5	568	1260	0	285.4	4396.9	27.68%
Totals	1776	600	1030	237.5	959.3	62.1	1566	841.5	1369	1186	3796	526	1939	15887.5	100.00%

Note : A,B,C,E,.... indicates districts notations as given in item 4.1.3
L indicates local links,I important links like bridges, tunnels, ferries, and D indicates local links having bridges belonging to RBA.

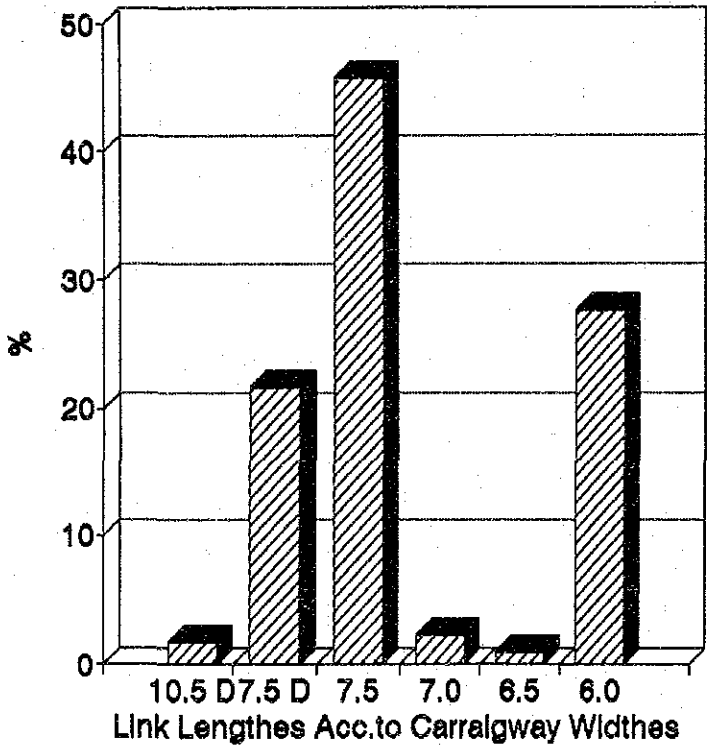

Fig. 4-1-4 Link Lengths According to Carriageway Widths

For the evaluation of the shoulder geometric characteristics, Fig. 4-1-5 has been deduced from the LINKFILE. The majority of the shoulders have two meters width. About 46% of the shoulders are paved shoulders, the rest are earth shoulders. Paved shoulders are mainly provided to divided and two-lane full dual highways.

Shoulder Type	Shoulder Width mt.	A	B	C	D	E	I	L	M	Q	R	S	T	W	Totals	Percen.
---	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00%
Paved	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00%
Paved	1.0	6	18	0	0	0	15.1	26.5	0	0	0	0	0	143	208.6	1.31%
Paved	1.5	0	11	86.5	0	12.6	9.5	134	113	0	0	150	0	38	554.6	3.49%
Paved	2.0	457	202	407.4	0	613.6	11.5	548	455	325	0	669.8	526	329	4544.3	28.60%
Paved	2.5	0	0	0	0	0	16	0	0	330	0	60	0	0	406	2.56%
Paved	3.0	211	129	13	0	0	0	93	0	0	0	93	0	970	1509	9.50%
Earth	0.5	0	0	0	0	0	10	0	0	0	0	0	0	0	10	0.06%
Earth	1.0	0	0	0	0	0	0	22	7	91.5	0	0	0	37.2	157.7	0.99%
Earth	1.5	0	23	0	0	0	0	203.9	25	7	0	178.5	0	38	475.4	2.99%
Earth	2.0	939	101	168	237.5	333.1	0	538.5	241.5	530	486	2511	0	77.4	6162.9	38.79%
Earth	2.5	0	31	0	0	0	0	0	0	85	80	70	0	0	266	1.67%
Earth	3.0	163	85	355	0	0	0	0	0	0	620	64	0	306	1593	10.03%
Districts Totals		1776	600	1030	237.5	959.3	62.1	1566	841.5	1369	1186	3796	526	1939	15887.5	100.00%

Note : A,B,C,E,... indicates districts notations as given in item 4.1.3
L indicates local links,I important links like bridges, tunnels, ferries, and D indicates local links having bridges belonging to RBA.

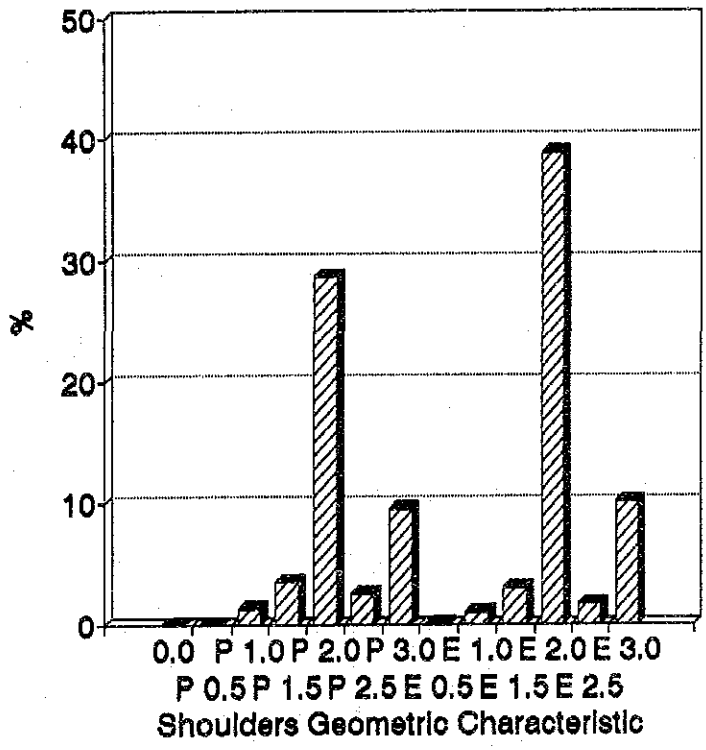

Fig. 4-1-5 Geometric Characteristics of the Shoulders

4.1.12 Evaluation of Links Pavement Condition

As has been mentioned under the section 4.1.10, the R.I. carried out in 1990 in the frame work of the study of the effect of the axle load on the deterioration of the road pavement, included the field surveys necessary for the

determination of the pavement condition index (PCI) for most of the inter city highway links. A total of route lengths of 7,778Km had been surveyed in this study, and the PCI values calculated for each link had been given in the ASS?.LST files of the section 4.1.10. An evaluation of the pavement condition of the inter city highway network based on the PCI calculated link values is given in Fig. 4-1-6. More than 60% of the total paved area has a pavement rating excellent and very good. A very small portion of the network have poor and failed condition rating.

Item Description	EXL.	V. GOOD	GOOD	FAIR	POOR	FAILED	Totals
Route Lengths(km.)	2082.56	2284.67	1388.46	795.43	1091.52	135.00	7777.64
Paved Areas(km2)	20.28915	21.63070	11.87753	5.988925	7.323379	0.977020	68.08672
Per. of Tot. Route Len.(1)	26.78	29.37	17.85	10.23	14.03	1.74	100.00
Per. of Tot. Paved Area(2)	29.80	31.77	17.44	8.80	10.76	1.43	100.00

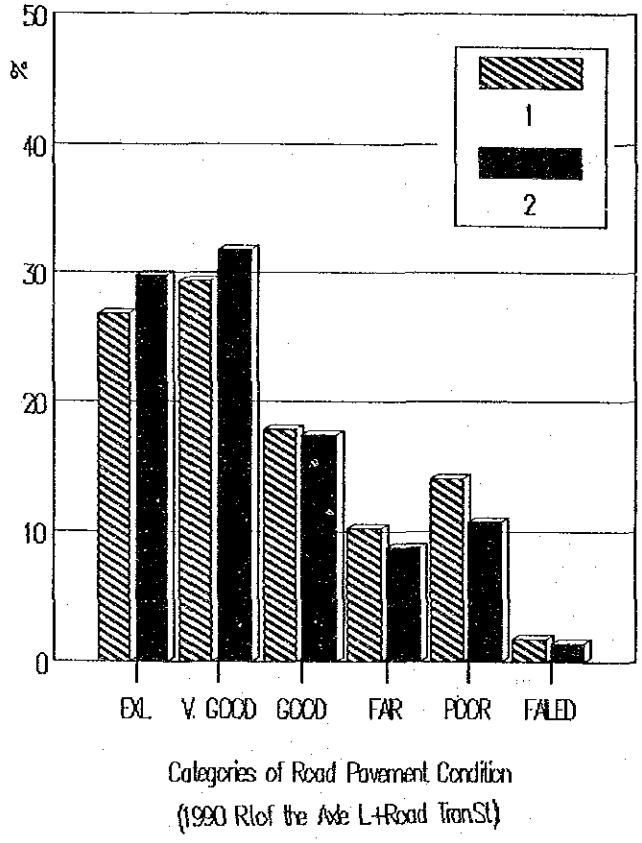

Fig. 4-1-6 Evaluation of Pavement Condition Based on Link PCI Values.

The percentages calculated on the basis of route lengths are smaller than that calculated on the basis of the paved area for the rating excellent and very good, and is higher for the ratings good, fair, poor and failed. This indicates that the pavement conditions are better for the wider divided and full two-way dual links, than the two-way dual 6.0m carriageway links.

The pavement condition of the inter city highway network was evaluated based on the PCI values surveyed and calculated in 1992 through the JICA sample R.I. described under the section 4.1.11. Fig. 4-1-7 presents the results of this sample R.I.

	Exl.	V.Good	Good	Fair	Poor	Failed	Totals
Link Lengths(km.)	1320.3	797.6	485.5	265.5	172.0	64.0	3104.9
Paved Areas(km2)	9.00000	6.04418	3.65307	1.97465	1.25617	0.24401	24.00126
Per. of Tot. Route Len. (1)	42.5	25.7	15.6	8.6	5.5	2.1	100
Per. of Tot. Paved Area (2)	45.1	25.2	15.2	8.2	5.2	1.0	100

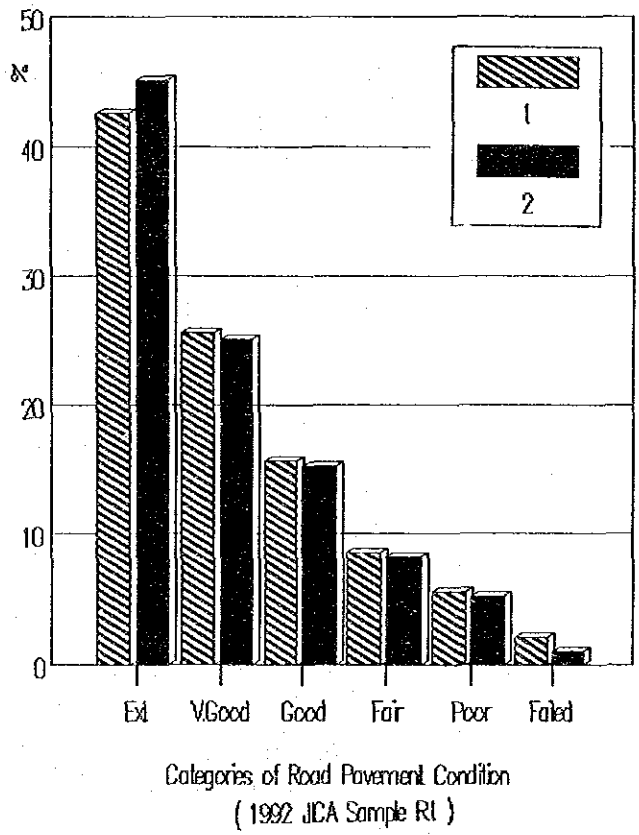

Fig. 4-1-7 Evaluation of Pavement Condition based on JICA Sample R.I.

The overall pavement condition rating is higher than that surveyed in 1990. The percentage of the area surveyed having a rating excellent and very good is around 70% compared to the 60% of the 1990. The increase in the percentage is in the rating excellent which is mainly on divided and toll highways. This could indicate an improvement in the pavement condition during the period 1990/1992, but could also be explained by the fact, that the surveyed links are the links having OD/survey stations which are located on cordon lines intersecting mainly main roads.

The shoulder pavement condition was also evaluated based on the values given in the LINKFILE. Fig. 4-1-8 presents the results of this evaluation together of their graphical presentation. Almost 46% of the shoulders are paved, the rest is left unpaved. Fair pavement rating is the predominant condition.

District	A	B	C	D	E	I	L	K	Q	R	S	T	W	Totals	Percen.
Paved G	339	296	150	0	246.6	52.1	391	123	58	0	436.5	44	42	2178.2	13.71%
Paved F	75	43	356.9	0	319.6	0	384.5	269	469	0	305.8	482	1346	4050.8	25.50%
Paved P	260	21	0	0	60	0	26	176	128	0	230.5	0	92	993.5	6.25%
Earth G	10	0	0	0	0	0	13.5	8	0	0	427	0	0	458.5	2.89%
Earth F	1092	115	523	237.5	266	0	646.4	104.5	508.5	846	1865	0	458.6	6662.9	41.94%
Earth P	0	125	0	0	67.1	10	104.5	161	205	340	531	0	0	1543.6	9.72%
Totals	1776	600	1030	237.5	959.3	62.1	1566	841.5	1369	1186	3796	526	1939	15887.5	100.00%

Note : A,B,C,E,.... Indicates district notation as given in item 4.1.3
L indicates local links,I important links like bridges, tunnels, ferries, and D indicates local links having bridges belonging to RBA .

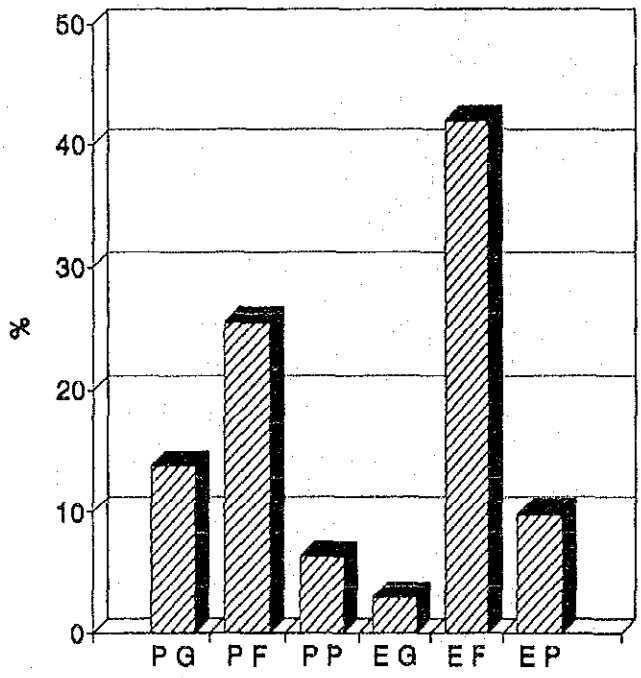

Fig. 4-1-8 Shoulder Pavement Condition

4.2 Bridges

4.2.1 Bridge Location Information

An important element to be considered in the analysis of inter city highway infrastructure is the existing bridges as well as their future expansion requirements. The required planning information was compiled for the existing bridges on the inter city highway network through the RBA bridge central administration and their bridges districts engineers. A form was designed to be filled for each bridge, and sent to the districts bridges engineers, requesting data about the location of the bridge and its design features. A file has been created for each district, which includes the necessary bridge planning information. These files will be used in a later stage when investigating the future volume of traffic using the highway network, together with its expansion needs.

Table 4-2-1 illustrates an example for the information compiled in co-operation with RBA. The table includes information about the bridges under the jurisdiction of the Asuyt District. The bridges are classified according to their location on the previously defined highway links in the district.

Column 1 in the table gives the serial number of the bridge within the district.

Columns 2 gives the link code on which the bridge is located.

Columns 3 & 4 give the code numbers of the innode and outnode of the link.

Column 5 gives the kilometrage of the link begin measured from the begin of its route.

Column 6 gives the bridge name.

Column 7 gives the bridge location code. The bridge location code is defined by its serial number on the route. All the bridges located on the same route are given serial numbers, starting by one with the first bridge on the route and ending with a serial number equals the total number of bridges found on the route.

Column 8 gives the kilometrages of the location of the bridges measured from the route begin.

Columns 9, 10 and 11 give data about bridge type. Column 9 gives the crossing type, where 1 denotes a Nile crossing, 2 a crossing of a drain or a canal, 3 a railway crossing, and 4 other unidentified crossing. The type of the material of the superstructure of the bridge is given in column 10. Reinforced concrete bridges are denoted by 1, pre-stressed R.C. bridges are denoted by 2, steel bridges by 3, and unidentified by 4. The type of operation of the bridge is given in column 11. Moving bridges over navigable channels are identified by 1, fixed bridges at ground level over non-navigable canals are identified by 2, elevated bridges over

navigable canals are denoted by 3, and unidentified by 4.

Column 12 gives the length of the bridge along the longitudinal direction of the link between the two end side wing walls.

Column 13 gives, carriageway width across the highway link.

Column 14 gives the permissible loading on the bridge.

Table 4-2-1 Bridge Planning Information

SERIAL	LINK CODE	INNODE CODE	OUTNODE CODE	KILOMETRAGE OF LINK BEG.	BRIDGE NAME	BR. LOCATION CODE	KILOMETRAGE OF BRIDGE/RT.	TYPE OF BRIDGE CROSS.	MATER.	OPERA.	BRIDGE LENGTH (m)	CARRIAGE WAY WIDTH(m)	LOAD (ton)
1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	000222	2501	2409	288.00	ELEV. DAIRUT	0002031	298.50	2	1	3	152.00	13.00	70
2	000232	2501	2409	288.00	EL GALAA (EL MOAAHDA)	0002032	298.60	2	3	1	75.00	9.00	70
3	000233	2504	2505	361.00	EL MALAH	0002033	363.00	2	1	2	17.00	10.00	70
4	000233	2504	2505	361.00	ARAB EL MADABEGH	0002034	368.00	2	1	2	17.00	10.00	70
5	005702	2542	2508	10.00	EL MEANA	0057001	17.50	2	3	2	29.30	12.00	70
6	005901	2402	2401	0.00	EL IDWA	0059001	1.00	2	1	3	96.00	10.00	30
7	026702	2474	2472	5.00	DERWA	0267001	10.50	2	1	1	96.00	9.00	30
8	026703	2474	2473	5.00	EL BADRMAN	0267002	14.49	2	1	1	72.00	9.00	30
9	026901	2475	2476	0.00	MASARET MALLAWI	0269001	0.10	2	1	2	73.00	9.00	30
10	027001	2403	2473	0.00	DEIR MAWAS	0270001	0.50	2	1	1	80.00	5.00	5
11	032003	2605	2642	9.00	AKHMIM	0320001	9.50	1	3	1	666.00	14.00	30
12	036201	2575	2576	0.00	OLD NAZALY GANOUB	0360001	0.25	2	1	1	105.00	5.00	5
13	039201	2503	2579	0.00	NEW MANFALUT	0392001	0.50	2	1	1	101.30	10.50	70
14	039202	2503	2580	0.00	OLD MANFALUT	0392002	0.50	2	3	1	96.00	5.15	5
15	039203	2503	2581	0.00	MANFALUT	0392003	0.50	2	1	1	100.00	10.00	70
16	039801	2477	2478	0.00	TAL EL AMARNA	0398001	0.20	2	1	1	79.00	9.00	30
17	042701	2408	2471	0.00	EL SAWAHGA	0427001	12.80	2	1	1	73.00	9.00	30
18	049201	2572	2573	0.00	SANABO	0492001	0.10	2	1	1	94.70	8.00	30
19	049401	2565	2584	0.00	BENI HUSSEIN	0494001	0.80	2	1	1	93.00	7.50	70
20	057701	2405	2470	0.00	SHUSHA	0577001	4.50	2	1	1	73.00	6.00	20
21	093301	2406	2440	0.00	ELEV.MINYA	0933001	0.50	1	2	3	1800.00	21.50	70
22	094201	2570	2571	0.00	EL QURASHIAH	0942001	0.10	2	1	1	93.70	8.00	30
23	094301	2502	2574	0.00	EL QUSIYA	0943001	0.25	2	1	1	105.00	10.00	70
24	094401	2577	2578	0.00	BANI QURAH	0944001	0.30	2	1	1	85.00	10.50	70
25	094501	2583	2582	0.00	EL HAWATKA	0945001	0.50	2	1	1	101.70	10.50	70
26	094601	2543	2586	0.00	OLD MNQBAD	0946001	0.25	2	1	1	93.00	7.00	30
27	094602	2543	2587	0.00	NEW MNQBAD	0946002	0.25	2	1	3	85.00	13.00	70

The total registered bridges are 1,030 in the whole country as shown in Table 4-2-2. Bridges are consisted of several spans and those which have movable type span are 82 or 8.0%, almost all have rotation types. 286 bridges or 27.7% have total bridge length of more than 200m and 733 or 71.1% have the length of 50m - 200m.

Table 4-2-2 RBA Bridges in Egypt

RBA District	Cross Type				
	Nile	Canal Drain	Rail	Others	Total
1 Asyut	2	25	0	0	27
2 Beni Suef	1	108	0	0	109
3 Central	2	27	4	0	33
4 Minya	4	312	4	0	320
5 Qena	3	162	2	0	167
6 East Delta	4	179	1	0	184
7 Red Sea	0	0	0	0	0
8 Sinai	0	26	0	0	26
9 West Delta	0	162	1	1	164
Total	16	1,001	12	1	1,030

4.2.2 Individual Bridge Information

A bridge is consisted of various types of structure elements by span, pier and abutment, so that Study team proposed to RBA to make a file for individual bride information for maintenance and inspection works, which includes;

(a) General information of bridges (Name, location, route, etc.)
(b) Main information such as serial code, bridge type, lane number, total length, width, vertical profile information, number of span, length, area, structure types, and effective length of each span, etc.
(c) Information on super structure such as design and contractor's name, cost, completion date, slab and main girder type and dimensions, etc.
(d) Information on sub-structure including information on foundation and piles
(e) Information on bearing
(f) Information on expansion joint
(g) Information on bridge furnitures such as lighting, hand rail, and so on
(h) Reference drawing numbers
(i) Inspection, repairing and maintenance work records

The prototype format of these information was handed to RBA with a preliminary record manual.