

V. ROADS AND UTILITIES

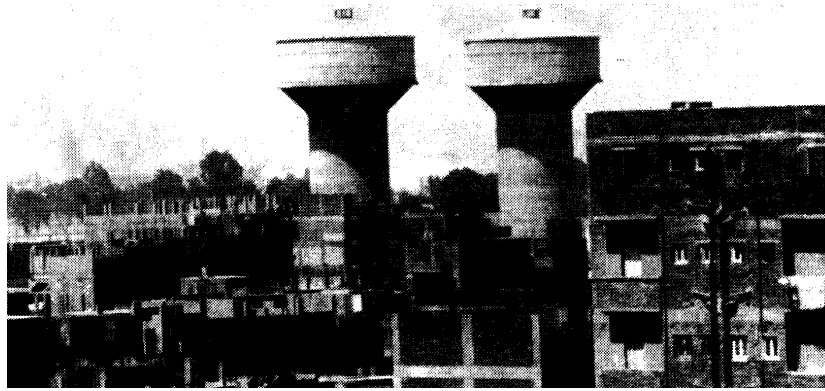


Photo 5.1 Water towers built along north edge of project

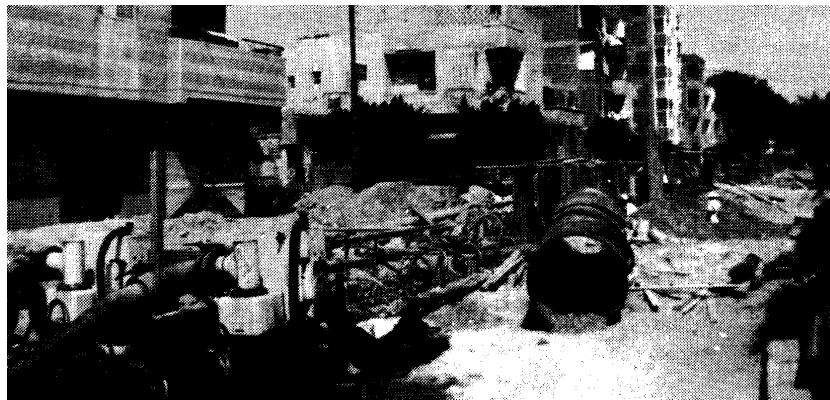


Photo 5.2 Upgrading – installing main sewerage network

STREET NETWORK

Existing situation in 1977

Figure 5.1 shows all the existing utilities in Hai El Salam in 1977.

Deficiencies

- The road system had no clear hierarchy, it was a neutral network of roads in both directions.
- Road widths were constricted in certain parts as buildings protruded into the road right-of-way.
- All road surfaces were very poor consisting mainly of unconsolidated loose sand. The only surfaced road was the extension of Talaatini Street in the west of the area.

Potentials

Constructed plots were not too closely located leaving access roads between them that created a near grid-iron network.

Proposals

The area was limited in the north by the motorway reservation and in the east by the arterial, Shibeen El Koum Street, which was planned to provide one of the main connections with the central part of the city. The proposed street layout (see figure 5.2) is a modified grid based on the existing street pattern. The figure shows how a street hierarchy has been imposed on the grid system. The local streets define neighbourhoods within which access streets provide circulation. In the developed area the distributors are alternate existing north/south routes and discontinuous east/west routes which utilize the widest of the less well-defined pattern of existing cross streets, with the exception of two primary district streets, one limiting the project area to the south (El Bahri Street) and one planned north of the community centre.

The consultants recommended that an east-west arterial proposed in the master plan to cross the built-up part of southern Hai El Salam be omitted. Investigation showed that there would be sufficient capacity available in the east-west corridor to cope with expected demand if the section of the arterial through Hai El Salam was not built. The proposals for Hai El Salam also down-graded the extension of Talaatini from an arterial to a district street; a function more appropriate to the kind of frontage development proposed. The nearby Port Said Road would take the arterial traffic diverted from the Talaatini extension.

These proposals show the Talaatini extension over passing the motorway to provide access into the university site; sufficient right-of-way was provided to allow for works associated with an overpass.

Levels of provision of streets

The levels of provision of road construction are detailed in table 5.1 and indicated on figure 5.2.

Implementation

The first stage to be implemented included a complete main road network of 11.5 km length. It would be built after the completion of the sewerage network. Funding was by Project Agency Funds - £E 1,275,902 (1990, US\$ 455,680). Further roads are being implemented at a cost of £E 600,000 (1990, US\$ 214,286).

The second stage aims at completing the project roads, a remaining length of nearly 15 km at an estimated cost of £E 3,000,000 (1990, US\$ 1,071,430). The funds are not yet available.

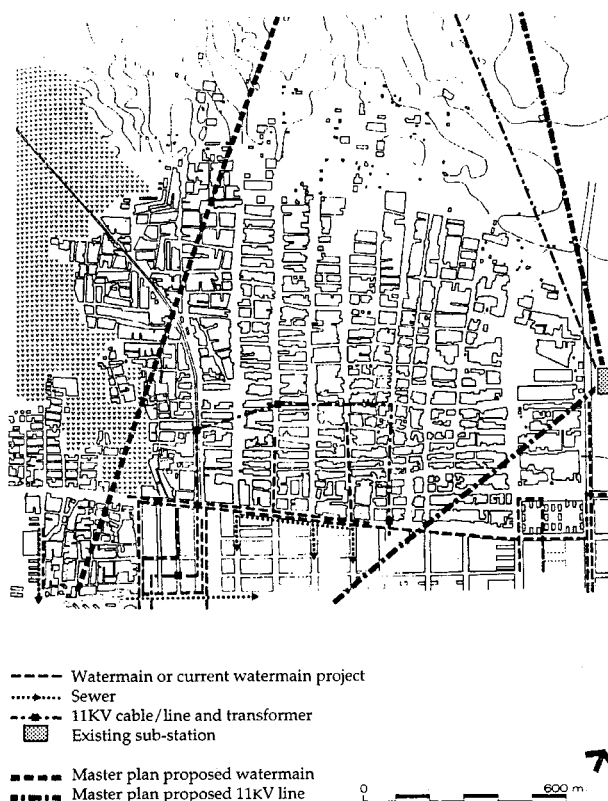


Figure 5.1. Hai El Salam existing utilities and master plan proposals

Source: Arab Republic of Egypt, 1978: vol. 1.

Table 5.1 Hai El Salam streets - levels of provision			
Street		Level of provision	
Type	Name	Initial	Full
District	Talaatini	Surfaced	Paved (asphaltic)
	Mustashfa East-west	DBST*	Concrete
Local		Graded with gravel surface	Surfaced (DBST)
Access		Transitable	Graded with gravel surface

Source: Arab Republic of Egypt, 1987: vol. 1
 *DBST-Double Bitumen Surface Treatment

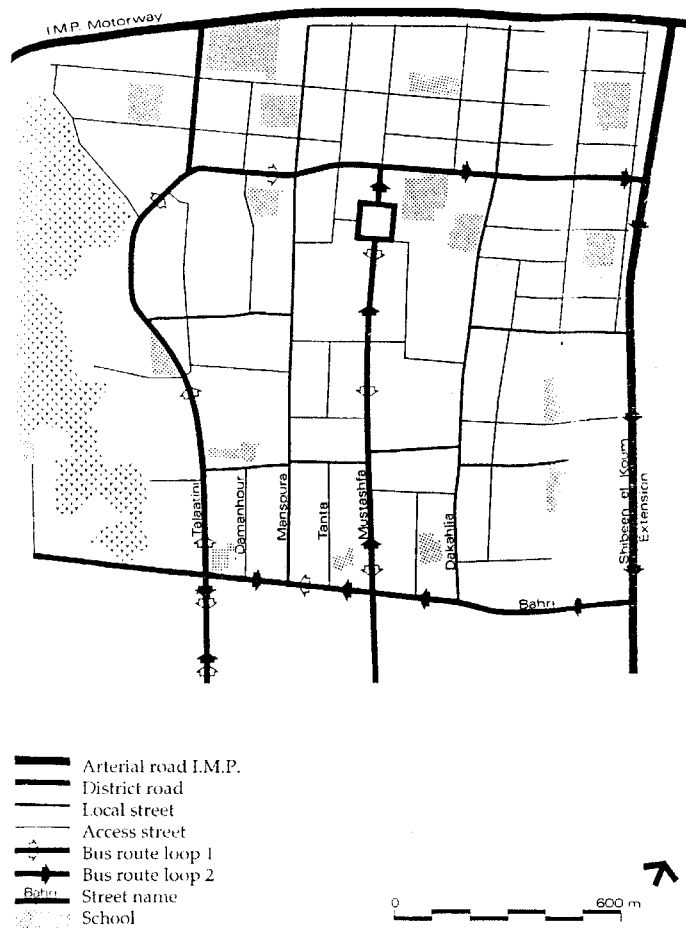


Figure 5.2 Hai El Salam transport
 Source: Arab Republic of Egypt, 1978: vol. 1.

Table 5.2 Street network summary			
Existing situation	Project proposals	Implementation/evaluation	Lessons learned
<p>Deficiencies No road hierarchy, constricted, poor surfaced road.</p> <p>Potentials Construction not too closely located leaving gird-iron roads in between.</p>	<p>A hierarchy has been imposed on the existing grid system. Local streets define neighbourhoods. Surfacing was to be phased and to follow infrastructure works.</p>	<p>After the sewerage network was implemented, a road network (11.5 km) was implemented. Phase 2 aims at completing the project roads (15 km).</p>	<p>Use existing roads to create a proper hierarchical network. Phase street surfacing in coordination with infrastructure works.</p>

PUBLIC TRANSPORT

Existing situation in 1977

Deficiencies

- The area was not served by a public transport system.

Potentials

- The residents had to walk to the peripheral roads (Bahri Street to the south) to gain access to public transport.

Proposals

A bus transport system was proposed to run between Hai El Salam and the bus station to its south. Within Hai El Salam two routes are proposed (see figure 5.2)

- A loop based on Talaatini Street, the new east-west district street and Mustashfa Street.
- A loop based on Shibeen El Koum Street, the new east-west street and Mustashfa Street.

In the first stage only part of the first route could operate and run on Mustashfa Street, terminating at the community centre. The full loop service would be introduced as soon as the link between Talaatini and Mustashfa Streets was completed. The second loop service would be started only when the extent of development in the east and north east of Hai El Salam was sufficient to justify service on Shibeen El Koum. It was proposed that alternative buses on the loop routes run in opposite directions creating a two-way service. Thus pairs of buses would be needed to operate the services.

It was seen likely that the proposed university, sited to the immediate north of Hai El Salaam would create demand for its own bus services. It had been assumed that such services would be additional to these proposals.

Implementation

Implementation would be gradual depending on the surfacing of roads and increase of population.

Existing situation	Project proposals	Implementation/evaluation	Lessons learned
Deficiencies The area was not served by public transport except via peripheral roads.	Alternative bus routes on the loop routes would run in opposite directions creating a two-way service.	Implementation would be gradual depending on the surfacing of roads and increase of population.	Tie local transport system into existing city-wide system incrementally.

WATER SUPPLY

Existing situation in 1977

Deficiencies

- All units lacked direct individual water supply.

Potentials

- Water provision consisted of a small number of standpipes in the southern part of the project area. Additional standpipes were being added at the time of the surveys with the new water main in central Hai El Salaam.

Proposals

The proposed water distribution network (see figure 5.3) consists of a primary ringmain feeding four secondary ringmains each supplying water to approximately 24,000 people by the year 2000. The implementation was phased incrementally to follow demand (see figure 5.4). Water is supplied to the area by gravity from a storage reservoir, situated some 400 metres north of the project area in the proposed university area.

The first stage of improvement would consist of the installation of some 75 standpipes on a 150 meter grid, supplied from the south of the site by connections to the existing network. In order to minimize abortive costs, the standpipes were planned to be fed by pipes ultimately forming part of the full network. A branch from this initial system would supply water to the first phase of the community centre.

Where pressures and capacities permit, on-plot connections to single tap/shower units could be taken from the first-stage network. Subsequent extension of the distribution network would follow once the storage reservoir was to come into operation. By the year 2000, the average daily demand is estimated to be 18,600m³ with a peak hour demand of 537litres/second. Both figures include an allowance for irrigation water.

Implementation

USAID has participated in the implementation of the first stage of the water-supply project that included the creation of two main sources of water (two elevated water towers in the project area with a capacity of 2000m³/day). In addition, this stage included the provision of main streets with potable water network reaching a total length of 8.3 km. The first stage started in 1982 and was completed in 1984. The USAID provided US\$ 1,710,000 and Government of Egypt (GOE) provided £E 1,643,000 (US\$ 2,347,143) for this stage.

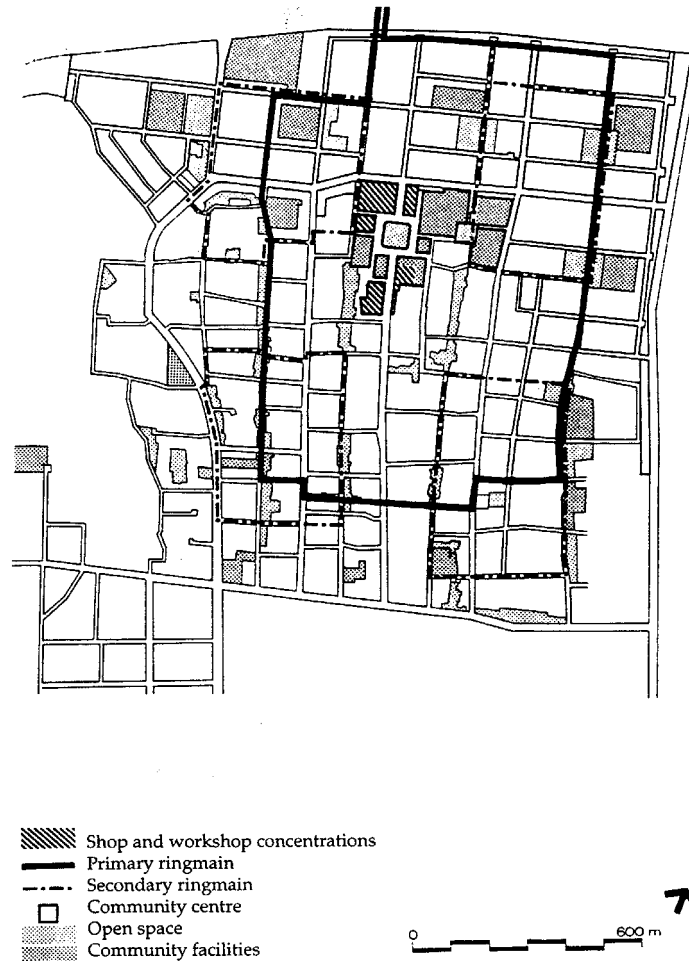


Figure 5.3 Hai El Salam water supply
Source: Arab Republic of Egypt, 1978: vol.1.

The second stage aimed at the provision of 32 km of potable water network to the secondary streets at a cost of £E 1,100,000 (1990, US\$ 407,407) (Project Agency funds - £E 750,000 (US\$ 277,778) and the Suez Canal Authority - £E 350,000 (US\$ 129,639)). This phase is currently being implemented.

Table 5.4 Potable water summary			
Existing situation	Project proposals	Implementation/evaluation	Lessons learned
<p>Deficiencies All units lacked direct water supply.</p> <p>Potentials Water provision consisted of a few standpipes in the southern area.</p>	<p>The water network would consist of a primary ringmain feeding 4 secondary ones. 1st stage: installation of 75 standpipes fed by pipes ultimately forming part of the full network.</p>	<p>1st stage: 2 water towers, provision of main streets with network. 2nd stage: provision of network to secondary streets, currently being implemented.</p>	<p>Upgrade and implement gradually to meet needs and means of users; first standpipes then full supply to individual units.</p>

WASTE WATER DISPOSAL

Existing situation in 1977

Deficiencies

- The sewerage network did not enter the project area and though mains existed immediately to the south, they did not have the capacity to take any new connection from the project area.

Potentials

- Individual solutions such as sewerage tanks for each plot were provided by plot owners.



Figure 5.4 Phasing of Hai El Salam water
 Source: Arab Republic of Egypt, 1978: vol.1.

Proposals

The proposed sewerage system (see figure 5.5) consists of several groups of branching sewers generally falling from the north-east of the site to a pumping station in the south-west. From this station, the sewage would be pumped to the sewage works in a rising main which bypasses the existing (inadequate) city system. Within the project area, secondary systems would discharge to two pumping stations in order to avoid excessive depths on the main collectors.

Phasing is discussed in more detail below (see figure 5.6). Briefly, proposals for the first phase consisted of the main collector running east from the pumping station, proposed in the master plan, then north up Mustashfa Street to the community centre and Phase 1 of the new development area. Phase 2 would consist of an extension to this system to the north-west corner of the project area and also the west collector running along the edge of the existing built-up area. The south-east system and pumping station would form the final phase. An emergency outfall from this station should discharge to the adjoining groundwater drain. It was proposed that the existing groundwater, or cover drain, should be cleared out and repaired as necessary.

The relatively low flows in the early years of the development were feared to result in silting-up along flat sections of the sewers. Regular inspection together with routine cleaning as necessary was recommended and was expected to prevent blockages.

In order to enable the community centre buildings to be supplied with water prior to the development of the sewerage system, a septic tank could be installed as a temporary measure. At detail design stage a suitable site would have to be identified to accommodate this provision. Special attention would have to be paid to the design of the drainfield and it was recommended that the tank would be maintained regularly.

By the year 2000, total daily sewage flow from the site was estimated to be approximately 13,800m³. Peak hour flow rate would be approximately 400 litres/sec. Both figures include an allowance for infiltration.

Implementation

The project provided a fleet of pump trucks to remove sewage from tanks in addition to the procurement of trucks for garbage collection (Project Agency Funds £E 979,258 (1980, US\$ 1,398,940)). The waterborne system has taken much longer to implement than initially estimated. This resulted from technical problems such as the high water table in the southern section of the project site. Delays and inflation have caused several changes of contractors and financing has been adversely affected. The Governorate of Ismailia coordinated with the national organization of potable water and

sewerage, and the Hai El Salam sewage disposal project was included in the programmes of USAID. The work was divided into two stages.

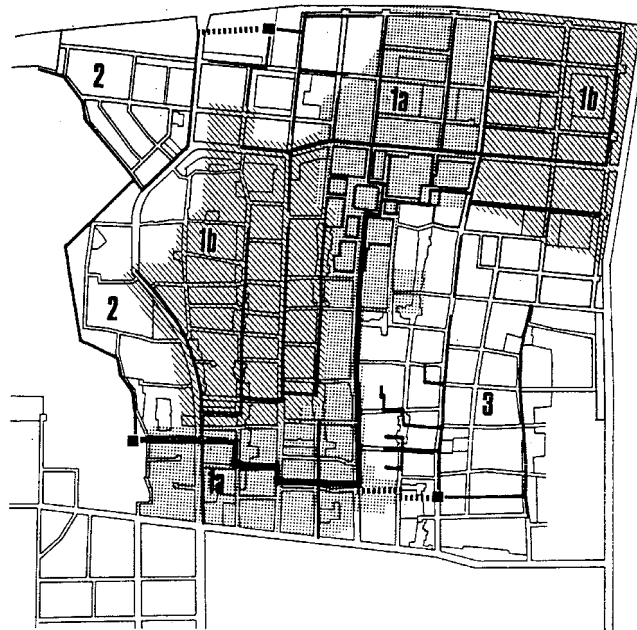
The first stage aimed at dividing the project into areas and the procurement of the pipes and the construction of pump stations and the implementation of a 49km sewerage network. USAID-funded design fees US\$ 10,000; pipe procurement US\$ 100,000; and pump station US\$ 2,000,000. GOE's share was £E 3,000,000 (1990, US\$ 1,071,430). So far 29,380 km have been implemented and work has started on the remaining 20 km.

The second stage aims at implementing the sewerage network within the secondary roads of the old section of the project area at a total cost of £E 3,000,000 (1990, US\$ 1,071,430). Funding is currently being sought to implement this stage. The project Agency has implemented access holes on the sidewalks so that residents could be connected to the main system without destroying street surface finishing. The connections to the manholes were implemented at a cost of £E 120,347 (1990, US\$ 42,980).

Table 5.5 Wastewater summary			
Existing situation	Project proposals	Implementation/evaluation	Lessons learned
<p>Deficiencies No waterborne sewerage system.</p> <p>Potentials The area was served by individual tanks.</p>	<p>Sewerage system would follow the natural slopes. Two pumping stations would be used to avoid excessive depths on the mains.</p>	<p>The project provided a fleet of pump trucks to remove sewage from individual tanks.</p>	<p>Implement gradually. First use individual tanks then a complete waterborne system.</p>



Figure 5.5 Hai El Salaam sewerage
Source: Arab Republic of Egypt, 1978: vol. 1



- Phase 1a
- Phase 1b
- Main collector, phase 1
- Primary collectors
- Raising main
- Pumping station

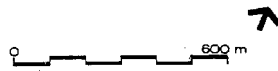


Figure 5.6 Phasing of Hai El Salam Sewerage

Source: Arab Republic of Egypt, 1978: vol. 1



Photo 5.3 Surfaced street before infrastructure installation

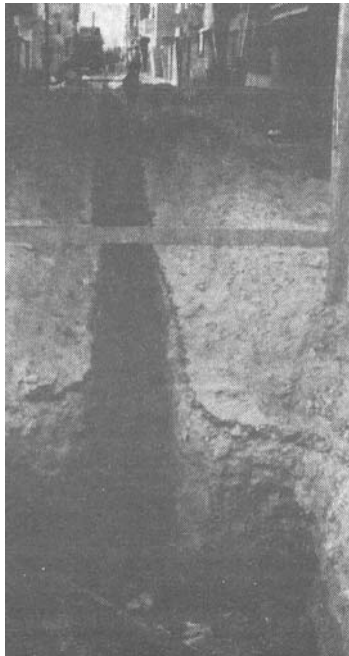


Photo 5.4 Trenches dug for sewerage pipe installation



Photo 5.5 Project Agency trucks to evacuate pit latrines

SOLID WASTE

Existing situation in 1977

Deficiencies

- Garbage was not systematically and hygienically disposed of. It was disposed of in locations far-away from the site then periodically burned.

Proposals

The provision of trucks for garbage collection to ensure proper hygienic disposal.

Implementation

The Project Agency provided a fleet of trucks for garbage collection. Costs are included with the cost of pump trucks for wastewater disposal discussed in the previous section.

Table 5.6 Solid-waste disposal summary			
Existing situation	Project proposals	Implementation/evaluation	Lessons learned
Deficiencies Garbage was disposed of in far-away locations then burnt.	Trucks would be provided for garbage collection to ensure proper disposal.	The Project Agency provided a fleet of trucks for garbage collection.	Organize and improve garbage disposal through a central agency.

ELECTRICITY

Existing situation in 1977

Potentials

- A new electricity distribution network had been installed in the existing Hai El Salam area just before the survey, and the area was thus reasonably well served.

Proposals

Primary distribution was proposed to be by means of an 11 kV underground cable linking to 18 transformers rated from 200 to 300 kVa. Secondary distribution would be a 380/220 volt supply, generally on overhead lines (see figure 5.7). In areas such as the community centre, the secondary network is would be located underground to improve the visual amenity of the area.

It was recommended that the existing overhead 11 kV line across the north-east corner of the site should be replaced by an underground cable routed under local roads.

Provision of electric mains and of street lighting in all district streets was planned for the initial stage. This would be followed by the completion of all street lighting.

Implementation

The first stage included the provision of electricity required for lighting. It included the provision of 26 transformers in addition to street lights (Project Agency Funds - £E 1,500,000 (1982, US\$ 2,142,857)). The Ministry of Electricity, through the Rural Electrification Organization, participated in the provision of eight transformers in addition to 350 street light poles to complete the second stage that ended in 1989 (Ministry of Electricity funding - £E 683,744 (1990, US\$ 244,194)).

Existing situation	Project proposals	Implementation/evaluation	Lessons learned
Potentials A new electricity network had been installed before the project, thus the area was reasonably served.	Primary cables under-ground would be linked to 18 transformers. Secondary overhead lines would only be provided to special areas to improve visual amenity.	1st stage: provision of street lighting on main roads. 2nd stage: provision of secondary street lighting.	Phase provision of electric distribution lines and street lighting to reduce street initial costs.

TELEPHONES

Existing situation in 1977

Deficiencies

- The area had no telephone service due to its illegal status and the low income of the inhabitants.

Potentials

- The new city telephone exchange was located immediately to the south of the project area, thus the area is well placed for provision of a telephone network.

Proposals

Initially, public telephones were proposed to be installed on the two major north-south streets and on the east-west street immediately north of the community centre, and thus be within 500 metres of every dwelling.

Implementation

Telephones have been supplied to some of the shops for public use in the project area. More telephones should be provided for public use.

Table 5.8 Telephone summary			
Existing situation	Project proposals	Implementation/evaluation	Lessons learned
<p>Deficiencies</p> <p>No telephone services due to illegal status and inhabitants' low incomes.</p>	<p>A new city telephone exchange located south of the area, was foreseen to provide a telephone network.</p>	<p>Telephones have been supplied to some shops for public use. More telephones should be provided.</p>	<p>Phase implementation according to needs.</p>

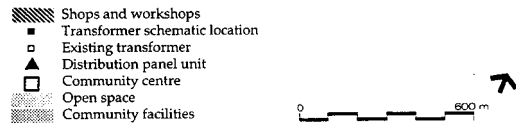
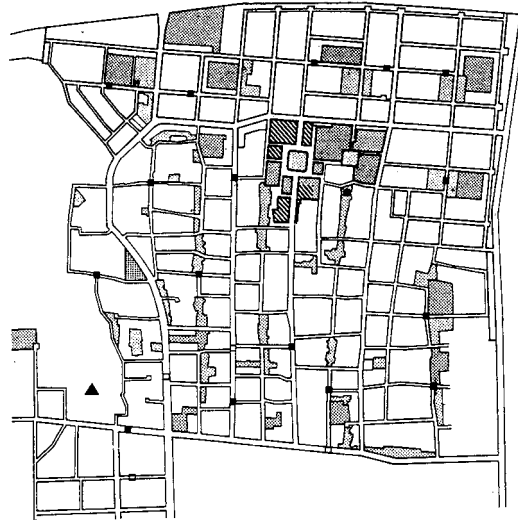


Figure 5.7 Hai El Salam power
Source: Arab Republic of Egypt, 1978: vol. 1