

# CHAPTER VII

## PUBLIC UTILITIES AND URBAN DEVELOPMENT

Adequate public utility services are necessary for the development of other sectors of the economy. These services include electric power, nonagricultural water supplies, sewage and waste disposal; and municipal services such as street improvement, storm water protection and drainage, and provisions of markets, cemeteries and slaughterhouses.

The public utilities sector has been expanding at an annual rate of 14.2 percent during the past five years as measured by its contribution to gross domestic product. The rapid expansion of this sector is expected to continue at an average annual rate of 13.2 percent during the period of the Plan.

Many of the problems facing the electric utilities that serve the urban areas (such as voltage irregularities, service interruptions and inability to provide service) will be overcome by the end of the Plan, and all reasonably accessible towns of more than 2,000 people are expected to be electrified by private firms with governmental financial assistance during the same period.

High priority will be given to providing urban areas with water and sewage systems. The major cities will have these systems by the end of the Plan. Towns and villages will also be provided with adequate water supplies during the Plan; the urban areas will be protected against flooding by storm water, and additional facilities will be provided for other municipalities.

General strengthening of the organizations involved will take place in the next few years. In addition, efforts will be made, in particular, to improve revenue collections from users of services where user charges are appropriate. Training will be emphasized at most levels of operations.

### ELECTRICITY

The electrical industry has experienced many problems in the effort to provide electrical service to the rapidly expanding economy. Interruptions of service, voltage fluctuations, inability to provide timely service, and the lack of standards in the assessment of connection charges have been commonplace in the urban areas of the Kingdom.

There has been little organized effort to develop a community electrification program for the rural areas although several ministries, as well as numerous private individuals and firms, have electrified many communities within the Kingdom. Since most of these systems have been installed without guidance or supervision, many are inadequate and need expansion or replacement.

All of these problems represent losses to the economy, either directly or indirectly. Although much progress has been made in correcting them, much remains to be done. This will require an organized and cooperative effort by affected organizations in the public and private sectors.

#### Objectives

The objectives of the electrical development program are to:

1. Meet the electric power requirements of the industrial sector at rate levels which do not inhibit growth;
2. Meet the demands of other consumers at lower rates than exist at present;
3. Generally improve and standardize existing services through institutional and technical changes. These will require:
  - a. The establishment of a regulatory body for electrical services;
  - b. Improvements in service to discourage installation of generation plants by private organizations; and,
  - c. Increases in plant utilization of the utilities by application of appropriate rate structures and other methods.
4. Encourage small scale industrial and economic growth and provide better living conditions through a phased rural electrification program.

Specific targets are to:

1. Attain service standards and rate levels so as to minimize installation of isolated generating plants within franchised areas of major utilities by the end of the plan period.

2. Electrify most communities with a population over 2,000 by the end of the plan period.
3. Initiate institutional improvements which will include the establishment of a regulatory body early in the program period to replace the Power Section in the Ministry of Commerce and Industry. This body, when established, will take over the responsibility to supervise electric facilities currently administered by other ministries and companies that render services to the public. The body will issue a standardized system for accounting, make cost studies, design and prepare a basis for electricity rates for adoption by private companies.
4. Standardize the electric voltage and frequency by the end of the period.

## **Programs**

### **Urban Electric Companies**

Rapid expansion of the companies serving the areas of Jiddah, Mecca, Tayif, Medina, Riyadh, al-Hasa and Dammam/al-Khobar will continue. Generation is expected to total 1,500 million kilowatt hours at the end of the Plan.

Production of this amount of electricity will require increasing the existing capacity by 1.6 times during the plan period. This, together with auxiliary distribution and transmission equipment, will require an investment of about SR 400 million.

The generation necessary for the large scale industries proposed by Petromin, and perhaps others in the private sector, is not included in the above estimates. Although it is in general an uneconomic use of the Kingdom's resources for an organization to generate its own power when central power station service is available, the government will not, by decree, require these organizations to take power from the available utility. Instead, it will serve as a coordinating agent and let each case be determined based upon comparative costs.

Several isolated generating plants now exist: It is anticipated that by the time for replacement of these, the rates and service standards of the urban utilities will be such that it will be to the clear advantage of these organizations to buy power from the utility.

### **Rural Community Electrification**

The rural community electrification program for rural areas will be undertaken in accordance with the Council of Ministers Decision No. 826, dated 10.5.1388. This decree assigns responsibility for this program to the Ministry of Commerce and Industry and stipulates that there should be:

1. Maximum possible use of private capital to initiate rural electrification projects;
2. Maximum possible development of local management responsibility;
3. Utilization of Government funds to supplement private capital in amounts not to exceed 75 percent of total capital costs; and,
4. Ultimate repayment of funds.

The program outlined for the period proposes to electrify most reasonably accessible towns of 2,000 population or more. It includes 80 towns identified by name and administrative region as having sufficient population to merit electric service (see Fig. 24). Electrification of these communities is scheduled in five successive stages.

In the cases of ar-Ruq'i, al-Humatiyat, az-Zarqani, and Halit Ammar, the Ministry of Finance and National Economy will meet the total costs of all four projects. These are border communities at main entrances to the Kingdom where significant population growth is expected.

The priority for electrification of each town is based on its importance, considering such factors as population, economic significance, and the location of governmental establishments. These priorities are intended as guides to determine costs, but are flexible and can be altered as conditions warrant.

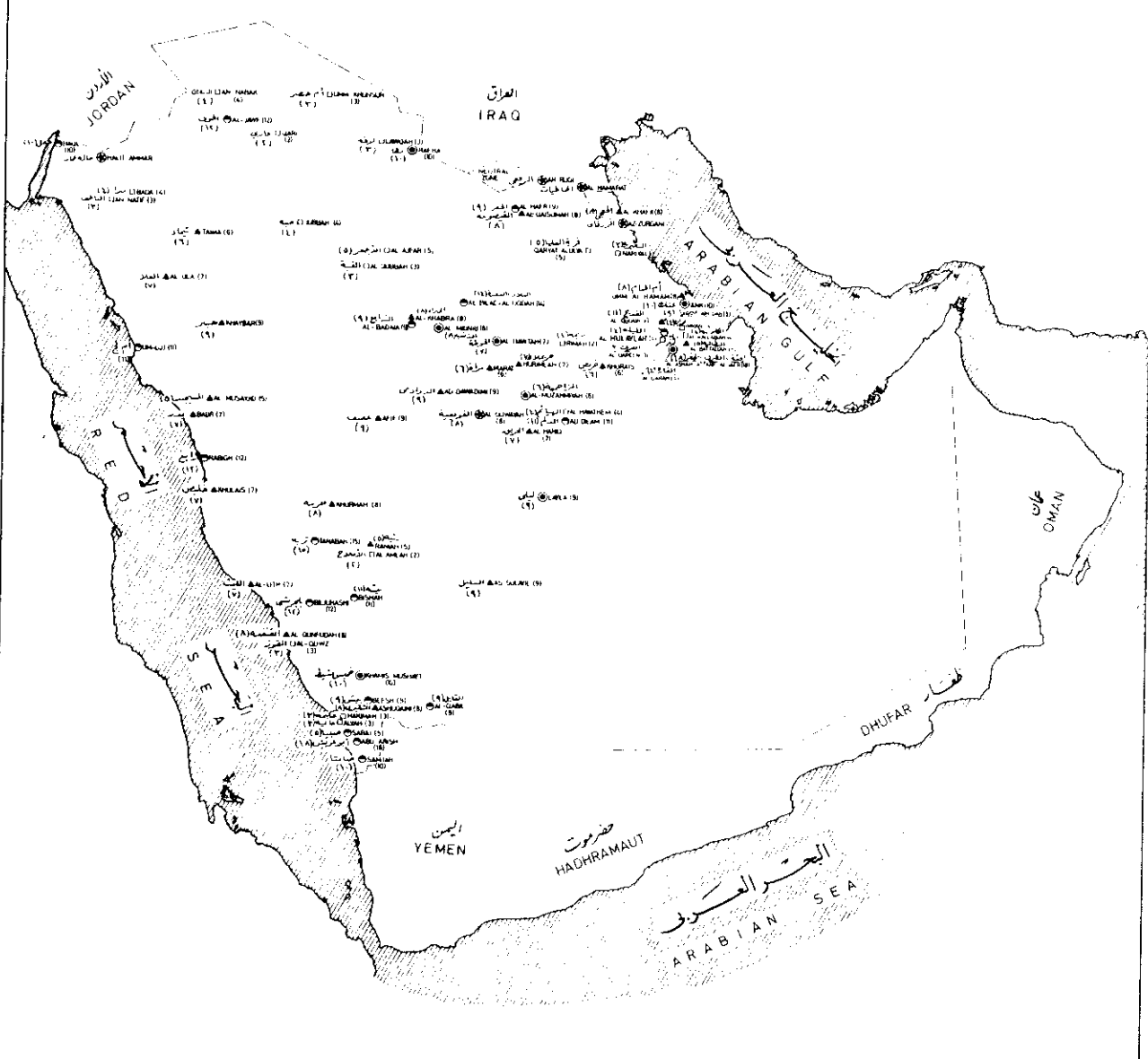
In developing financial requirements, it has been predicted that 25 percent of the cost burden will be assumed locally and the remainder borne by governmental fifteen-year, interest-free loans. Repayment will probably not be possible until at least three years after operations begin. With allowance for administrative arrangements and construction, repayment is not assumed until after the Plan.

The estimated cost of executing the entire project is SR 93 million, of which SR 23 million is expected to be raised privately as share capital and the remainder is to be provided as long term government loans. The costs and the proposed

**LEGEND**

- PHASE - 1
- PHASE - 2
- PHASE - 3
- PHASE - 4
- PHASE - 5

SCALE: 1:500,000



**RURAL ELECTRIFICATION PROGRAM**

KINGDOM OF SAUDI ARABIA  
CENTRAL PLANNING ORGANIZATION  
PLANNING DEPARTMENT

FIG-24



schedule of towns include communities for which electric systems are proposed by the Ministry of the Interior (Municipal Affairs), and the Ministry of Finance and National Economy.

The Ministry of Commerce and Industry will offer general technical assistance, supervision of construction, and supervision of operations. It will also engage in certain training activities.

### Electrical Service Organization

An ordinance for the establishment of a financially independent Electric Service Organization has been forwarded to the High Committee for Administrative Reform. The ordinance proposes giving this body the responsibility for the review and supervision of certain activities of both the governmental and privately owned electric utilities of the Kingdom. Such a body has generally been found necessary for electric utilities. Functions proposed include:

1. The issuance of rules and regulations which define in detail the relationship of the companies to their customers;
2. Issuance of an electric wiring code and safety standards;
3. Performance of electric rate studies;
4. Coordination of the rural electrification program;
5. Coordination and supervision of the program to make voltage and frequency uniform throughout the Kingdom; and,
6. Implementation of other improvements in company operation.

### Standardization of Voltage and Frequency

By the order of the Council of Ministers, the service voltage and frequency will be standardized throughout the Kingdom by the end of 1395 at 220/380 volts and 50 cycles. The cost of converting generation and distribution equipment will be borne by the electric companies involved.

Consumers who are affected by this change in service will have to replace and modify some of their electrical equipment. An extensive survey of all customers who will be affected by the conversion will be performed by the Ministry of Commerce and Industry. This Ministry will also be responsible for determining the best methods for conversion, both technically and economically.

### Financial Allocations

The total allocations required for the execution of the electrical program will be SR 99 million. Of this total, SR 89 million will be within Ministry of Commerce and Industry budget and the remainder will be in the budget of the Ministry of Finance and National Economy, as shown in Table 45.

TABLE 45  
FINANCIAL ALLOCATIONS FOR ELECTRICITY  
(SR Millions)

	<u>Recurrent</u>	<u>Project</u>	<u>Total</u>
<b>Directorate General of Industry &amp; Electricity</b>			
Existing Programs	0.9	—	0.9
General Consulting Services	—	9.0	9.0
Electric Service Organization	10.5	—	10.5
Building Improvement and Extension	—	1.5	1.5
Rural Electrification Program	—	66.7	66.7
<b>Directorate General of Industry and Electricity - Subtotal</b>	<b>11.4</b>	<b>77.2</b>	<b>88.6</b>
<b>Ministry of Finance and National Economy</b>			
Subsidies to Electric Companies	6.6	—	6.6
Electric Projects	—	3.8	3.8
<b>Ministry of Finance and National Economy - Subtotal</b>	<b>6.6</b>	<b>3.8</b>	<b>10.4</b>
<b>Total — Electrical Program</b>	<b>18.0</b>	<b>81.0</b>	<b>99.0</b>

## URBAN AND COMMUNITY WATER PROGRAM

The urban and the community water program has been given high priority in the development program, and major construction projects to supply adequate quantities of potable water to consumers have been initiated in the principal urban centers. At the same time, sources of water have been developed and distribution networks constructed for many of the communities in the Kingdom.

In cases where conventional sources of water were inadequate and sea water was available, water desalination plants have been constructed to provide the necessary water: water desalination plants are operating at Jiddah, Duba and al-Wajh. Equipment has been ordered for a plant at al-Khobar.

The general responsibilities for the development of water resources and the construction of delivery systems lie with the Ministry of Agriculture and Water, but the responsibility for distributing water to consumers lies with the Ministry of Interior for Municipal Affairs. There are certain exceptions to this division of responsibilities: the Ministry of Interior, for example, has developed water resources for the Eastern Province and is providing distribution networks for a few of the larger cities. Jiddah is another exception. The Ministry of Agriculture and Water has developed some of the production facilities as well as the delivery systems to Jiddah and the Aziziah Water Company distributes the water to consumers.

### Objectives and Targets

The objectives of the urban and community water program are to:

1. Determine potential water resources for non-agricultural use and develop them as required;
2. Deliver water from sources to consumers; and,
3. Establish the necessary administrative framework to provide water during the coming years to the largest extent possible from self-generated financial resources.

Specifically, the targets of the urban and community water program are to:

1. Complete the delivery and distribution systems in the city of Riyadh and the delivery system in Jiddah;
2. Develop or repair 550 wells for communities by the end of the plan period;
3. Complete or expand distribution systems for 162 communities during the plan period;
4. Complete the water desalination facility at al-Khobar and construct plants for 20 other communities in the Kingdom.

### Programs

#### Urban Water Systems

The Ministry of Agriculture and Water will complete the existing projects at Riyadh and Jiddah. Projects, or expansion of existing projects, to be undertaken by the Ministry of Interior during the period are a distribution network at Mecca, storage facilities and water storage construction and delivery lines at Medina, and some necessary projects at Tayif and al-Hasa.

#### Community Water Systems

Dam construction to supply water to the Abha area and the on-going project to provide a system at Khashm Ela'n will be completed; 550 wells will be drilled. Water distribution systems or expansions will be completed for 162 communities. When distribution systems are completed by the Ministry of Agriculture, they will be operated and administered by the Ministry of Interior.

#### Studies

Studies will be undertaken to determine water requirements of the urban areas and communities of the Kingdom, and the most economic means of meeting these needs. Alternative sources of supply will be considered, including dams, wells, pipelines, tank trucks and desalination.

#### Water Desalination Plants

The large desalination plant at al-Khobar and the smaller one at Khafji will be completed in 1390-91. Other small plants are to be constructed and the Jiddah plant is to be expanded twice during the remainder of the program period.

The execution of those projects will commence after the completion of the proposed study during the first year, so that the execution of any will be based on feasibility and priority. A fuel pipeline for the existing Jiddah plant is proposed for the first plan year. Foreign firms will operate and maintain the desalination plants at Jiddah, Duba, al-Wajh and al-Khobar. Other plants may be operated and maintained under similar contracts, depending upon the technical capabilities of the Ministry staff at the time the plants are completed.

A new headquarters building, and training center are proposed for the Saline Water Conversion Office.

### Organization

The organization of the Ministry of Interior will be strengthened, particularly in account collections. The latter improvements will increase government revenues and tend to discourage excessive usage of water.

Consideration will be given to making the status of some organizations in the potable water program autonomous bodies.

### Training

Training for the most part will be provided on-the-job by foreign contractors, but training abroad will be offered only to key employees.

### Financial Allocations

The total financial requirement of the urban and community water program will be SR 1,551.7 million as follows (details are included in Table 46):

	<u>Cost in SR Millions</u>
Ministry of Agriculture and Water	1,331.6
Ministry of Interior	220.1
<b>Total</b>	<b><u>1,551.7</u></b>

Revenues to the Ministry of Interior for Municipal Affairs are currently SR 26 million. Total revenues will be about SR 120 million per year when current and proposed systems are completed, improved collection practices are implemented, and revenues are received from the desalination facilities. This is about twice the level expected of the annual recurrent cost at the end of the period.

TABLE 46  
FINANCIAL ALLOCATIONS FOR URBAN AND COMMUNITY WATER  
(SR Millions)

	<u>Recurrent</u>	<u>Project</u>	<u>Total</u>
<b>Ministry of Agriculture &amp; Water</b>			
Operation and Maintenance of Existing Facilities	125.8	—	125.8
Riyadh Water System and Community Well Maintenance Contracts	—	156.8	156.8
Riyadh Water System Phase I Completion and Expansion	—	120.9	120.9
Jiddah Water System Improvement	—	52.7	52.7
Community Well Drilling	—	113.7	113.7
Community Distribution System Construction	—	256.7	256.7
Dam Construction	—	22.5	22.5
Al-Khobar Desalination Plant Construction and Maintenance	—	110.7	110.7
Jiddah-al-Wajh-Duba Desalination Plant Maintenance	—	118.2	118.2
Other Small Desalination Plants Construction	28.4	80.3	108.7
Jiddah Desalination Plant Fuel Pipeline	0.4	7.0	7.4
Jiddah Desalination Plant Expansion	—	94.3	94.3
Studies	—	35.6	35.6
Training Center	0.6	3.0	3.6
Headquarters Saline Water Conversion Office	1.2	2.8	4.0
<b>Ministry of Agriculture and Water-Subtotal</b>	<b>156.4</b>	<b>1,175.2</b>	<b>1,331.6</b>
<b>Ministry of Interior</b>			
Projects: Medina, Mecca, Tayif, Al-Hasa and Public Utilities			
Department of Eastern Province	35.1	185.0	220.1
<b>Total</b>	<b><u>191.5</u></b>	<b><u>1,360.2</u></b>	<b><u>1,551.7</u></b>

## MUNICIPALITIES

Recent years have seen considerable progress in the modernization of municipal facilities and services throughout the Kingdom. Major roads have been opened (at a considerable land acquisition cost), asphalted and lighted in many of the medium size and smaller municipalities where asphalted roads never existed, and considerable progress has been registered in extending the grid of asphalted roads in the major cities and towns of the Kingdom.

Municipal buildings (such as slaughterhouses, vegetable and meat markets, municipality buildings and garages, etc.,) have been erected in many of the Kingdom's municipalities. Sewage systems are operating in al-Khobar (where more than 70 percent of the households are connected), and in Dammam (where house connections have been started); the building of sewage systems in major cities (such as Riyadh, Jiddah, Mecca and Medina) is well under way. Power systems have been constructed by the Department of Municipalities in Jaof, al-Wajh, Hayil, Qurayyat, Tabuk and Najran. Control of those has recently been assumed by the Ministry of Commerce and Industry. Water Departments under the Department's jurisdiction take care of water supplies in Mecca, Medina, Tayif, and Hofuf. (The Public Utilities Department of the Eastern Province is responsible for water supply and sewage disposal in al-Khobar and Dammam.)

### Objectives and Targets

The objectives and targets of the Plan include the following:

1. Continuation of asphaltting streets, paving sidewalks, planting trees where practicable, and opening streets where traffic conditions warrant the step; emphasis will be given to improvement in traffic flow and reduction of dust. By the end of the period, major arteries in large and small communities will be paved; in major and small cities, only back roads will remain unpaved.
2. Expansion of street lighting to include all asphalted roads in all municipalities as well as major unpaved roads throughout the Kingdom. Almost complete coverage of the road system is expected by the end of the program period.
3. Completion of municipality requirements for urgent construction by the end of the Plan such that each municipality will have a municipal building, a slaughterhouse, a meat and vegetable market, and, where required, a municipal garage.
4. Completion, as far as possible, of sewage systems for major cities and important towns in the Kingdom that are in urgent need for those systems and particularly those for which final studies are currently being prepared.
5. Completion of storm water drainage systems for certain major cities. Systems will be completed for each of the major cities for which final studies have been made or are soon to be initiated.

### Programs and Projects (See Fig. 25)

#### Road Building

A major program during the period will be to pave roads, construct sidewalks and install street lighting. Projects will provide for such facilities for about 320 kilometers each in Riyadh and Jiddah; 225 kilometers in Mecca; 90 kilometers each in Medina, Tayif and Hofuf; 45 kilometers each in Buraydah, Dammam and al-Khobar. The remainder, about 550 kilometers, will be built in smaller municipalities.

#### Municipality Buildings

By the end of the period, all municipalities will be equipped with a modern, fully equipped slaughterhouse, a meat market and a vegetable market, and where appropriate, a fish market; and in most cases, a municipality garage.

Municipal buildings will be completed in the 11 main cities of the Kingdom.

#### Sewage Systems

Twenty-three percent of the total budget for the program period will be spent for sewage systems. Seventy-four percent of this will be expended in four major cities: Riyadh, Jiddah, Mecca and Medina. Thirteen percent will be used for 'Unayzah and Buraydah; Rahima, al-Wajh, Jizan and al-Kharj will absorb remaining 13 percent.

Other towns in the Kingdom are in need of sewage systems, but for several reasons construction is not planned for them during the period. Those must wait until the end of the Plan because of the time required to prepare final design studies, and existing priorities within available funding.



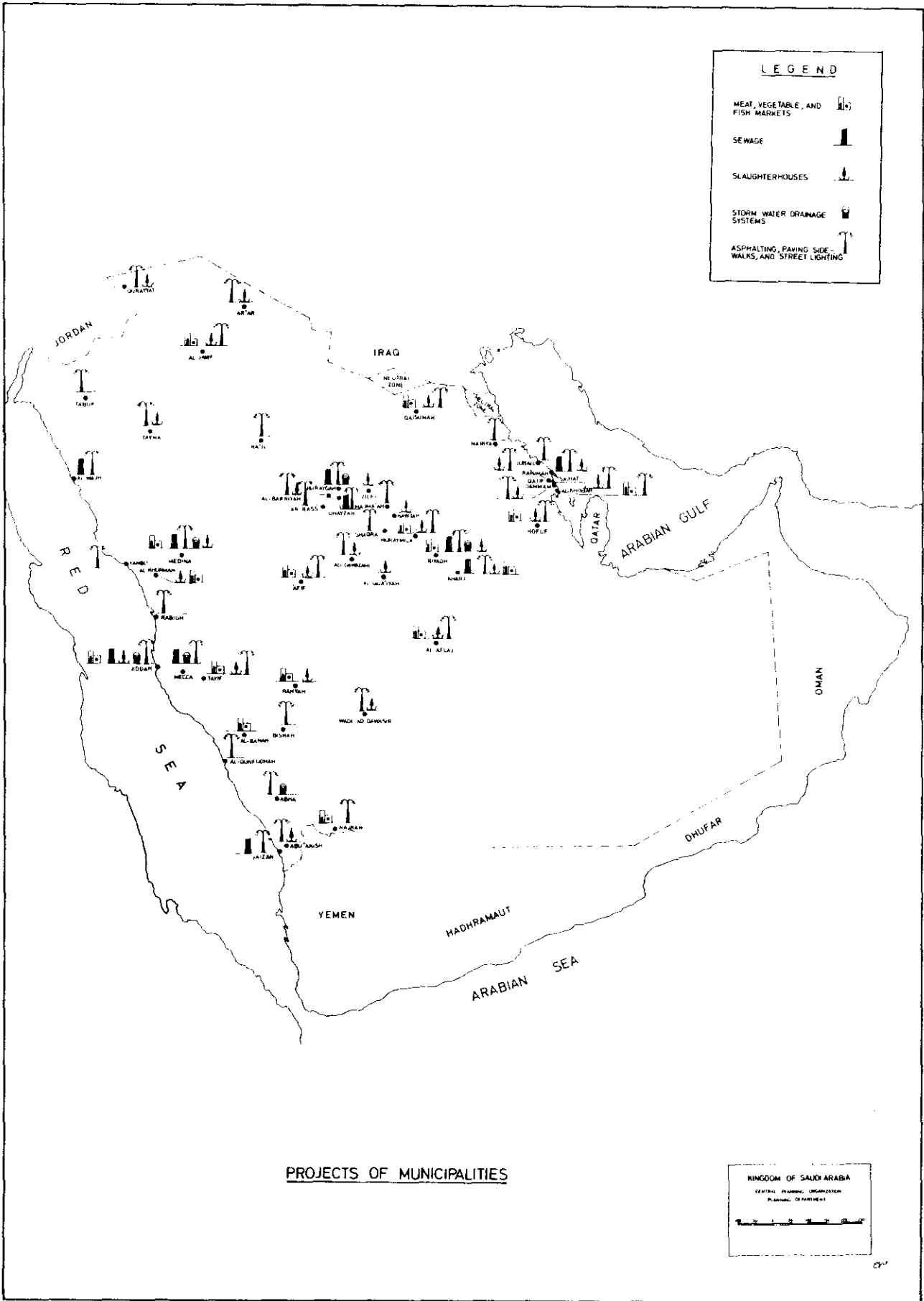


FIG - 25



### **Storm Water Drainage**

The possible loss of life and property due to storm damage is sufficiently severe to justify construction of storm water drainage systems for the major cities of the Kingdom. Storm water drainage systems should be completed during the plan period for Riyadh, Jiddah, Mecca, Medina, Abha and Buraydah.

The reasons for not proposing construction of storm water drainage systems for other municipalities within this period are similar to the reasons delineated above under sewer systems.

### **Other Projects**

Facilities proposed that will greatly increase the comfort of urban dwellers, include, but are not limited to, the following:

1. Public toilets;
2. Small earthworks to prevent flooding;
3. Wind screens to reduce dust;
4. Municipal garages;
5. Public parks in the major cities.

### **Other Commitments**

In addition to these projects, the Department of Municipalities has jurisdiction and fiscal commitments related to the water departments in Mecca, Medina, Tayif and Hofuf, and the Public Utilities Department of the Eastern Province (the latter being responsible for water supply and sewage disposal in Dammam and al-Khobar).

The required sums will be allocated to complete the Public Utilities Department of the Eastern Province, link the houses to the sewage systems in Dammam and Khobar, increase the quantity of drinking water and improve its quality in those two cities.

Lastly, the water networks in Hofuf and Tayif will be improved.

### **Department of Municipalities**

Other major items proposed are to conduct some studies and to expand the buildings of the central administration in Riyadh. Considering the probability of an increase in the number of municipalities during the coming years and the accompanying expansion of responsibilities and volume of work, the Department will require additional office space. The present facilities will be expanded to meet the needs of the personnel increases predicted to be required during the period.

Sewage system studies have not been performed for several sizable towns in the Kingdom which have population densities and other characteristics such as to require proper sewage systems. Sewage systems studies will be completed for Tayif, 'Unayzah, Tabuk, Najran, Al-Kharj, Hayil, Yanbu', Ras al-Khafji, Bishah, and al-Wajh. Regional and master planning studies are needed so that the expenditures on municipal programs can realize the most value to the people of the Kingdom. The plans will aid in determining the location of new roads, phasing of sewage networks and storm water drainage projects, location of municipal buildings, and so on.

### **Financial Allocations**

The recurrent allocations proposed by the Department of Municipalities for the period, excluding allocations for the Department's water projects, total SR 1,037 million and the project allocations for the same period total SR 1,884 million as shown in Table 47.

TABLE 47  
**FINANCIAL ALLOCATIONS FOR MUNICIPALITIES**  
(SR Millions)

	<u>Recurrent</u>	<u>Project</u>	<u>Total</u>
Administration Expenditures for Existing Facilities	969.0	—	969.0
Sewer Systems	45.0	680.1	725.1
Storm Water Drainage Systems	3.0	273.5	276.5
Asphalting, Sidewalks and Street Lighting	8.5	719.2	727.7
Slaughterhouses	5.0	23.9	28.9
Markets	0.6	14.0	14.6
Municipal Buildings	0.5	7.7	8.2
Land Acquisitions	—	80.9	80.9
Other Projects	4.8	29.9	34.7
Department of Municipalities — Projects of the Central Administration	1.0	55.0	56.0
<b>Total*</b>	<u>1,037.4</u>	<u>1,884.2</u>	<u>2,921.6</u>

---

\* Allocations for water projects of the Department of Municipalities is SR 220.1 million of which SR 185.0 million is project cost and SR 35.1 million is recurrent cost. This is included in the section of this chapter covering Urban and Community Water.