

CHAPTER 9

NATURAL RESOURCES

9. NATURAL RESOURCES

This chapter outlines the main objectives, policies and programs for the development of the Kingdom's water, energy and mineral resources. Included in this chapter is a discussion of the key issues that must be addressed in each sector in order to attain the longer term development goals.

9.1 WATER

9.1.1 Role and Development Objectives

In a desert climate, such as that pertaining in Saudi Arabia, water is the most important of all natural resources. This fact has been clearly recognized throughout the development planning process, and the availability of water has been a key element in determining the scale of longer-term development. The strategic role of the water sector is to meet the water demands of the various user categories through efficient exploitation of available water resources at the least cost and without unnecessary depletion of non-renewable fresh water resources.

Development of the water sector will be guided by the following longer term objectives:

- To provide sufficient quantities of good quality water, in keeping with recognized international health standards, to meet the needs of urban and rural communities;
- To secure sufficient water supplies to meet the demand of industrial development activities;
- To satisfy the water requirements of modern agricultural operations that aim to attain a prudent degree of basic food self-sufficiency;
- Endeavor to reduce water consumption by agriculture, without affecting its targeted growth rates;
- To conserve and develop currently proven water resources efficiently, and to seek new water resources;
- To generate sufficient revenues to cover operating costs for water production and distribution.

9.1.2 Achievements and Key Issues

During the Third and Fourth Development Plan periods a considerable increase in water production was achieved throughout the Kingdom in meeting citizens' needs for potable water supplies. During the Fourth Plan, eight desalination plants were constructed with a combined capacity of 374,000 cubic meters per day, thus bringing to 27 the total number of desalination plants in operation, with a total capacity of 1.9 million cubic meters per day. During the Fourth Development Plan, the Water and Sewerage Departments completed a water supply network amounting to 4166 kms and involving 136,000 new house connections. Total sewerage networks completed amounted to 2975 kms, with a further 122,000 house connections added during the Fourth Plan. Furthermore, the availability of large water supplies for irrigation has contributed to the successful development of agriculture.

As a result of an intensive dam construction program, particularly in the Western and South-Western planning regions, the utilization of the Kingdom's renewable water resources (surface water and shallow aquifers) has almost doubled since the year 1400. Further development of renewable water resources is an important element of the water supply augmentation process in the future. Table 9.1 shows the progress made in the development of water resources over the past 10 years.

TABLE 9.1

National Water Balance
(million cubic meters per year)

	1400	1405	1410
Water Demand			
Municipal & Industrial	510	1,200	1,650
Irrigated Agriculture	1,850	7,400	14,580
Total	2,360	8,600	16,230
Resources Utilized			
Surface Water & Shallow Aquifers (Renewable Water)	1,140	1,850	2,100
Desalinated Water	50	330	540
Reclaimed Waste Water	—	100	110
Non-renewable Water (deep aquifers)	1,170	6,320	13,480
Total	2,360	8,600	16,230

Key Issues

Notwithstanding the great achievements in developing the Kingdom's water resources, several key issues remain unresolved at the end of the Fourth Plan period, and have hindered the orderly development of a rational utilization program for the Kingdom's scarce water resources. In the last ten years, only limited field investigations have been undertaken to increase the proven reserves of non-renewable water contained in seven principal and eight secondary aquifers. Over this period, annual water extraction of non-renewable ground water has increased more than tenfold, mostly because of the rapid expansion of agriculture, and of wheat production in particular. This high growth rate in wheat production has been closely linked to high depletion rates of non-renewable water resources.

Other obstacles that hamper efforts to establish rational water management in the Kingdom are:

- the delay in completing the National Water Plan, halted in 1403 after an intensive 3-year effort by the Ministry of Agriculture and Water;
- the failure to complete some of the hydrogeological studies necessary to form a sound data base for completion of the National Water Plan and the updating of estimates of proven water reserves in principal and secondary aquifers;
- inadequate institutional arrangements for the effective management of the Kingdom's water resources development, and lack of effective coordination between concerned agencies;
- the lack of progress in transferring some water supply functions from MOAW to MOMRA;
- lack of incentives for less water intensive industrial development;
- little progress made in reclaiming waste water for agricultural, recreational and industrial purposes and for ground water recharge.

9.1.3 Role of the Government and the Private Sector

The government will continue to play a dominant and decisive role in planning, allocating and managing the utilization of the Kingdom's water resources. This role will require a review of the water sector's institutional arrangements that will be most appropriate to its responsibilities.

Furthermore, to meet the need for long term sustainable supplies of water, additional investment in some water treatment and distribution systems, and desalination plants, is expected during the Fifth Plan. The private sector will be encouraged to participate in financing some of these investments.

9.1.4 Policies and Main Programs

The principal policies that will govern water development both during the Fifth Plan period and further into the future are:

1. A phased conservation program will be established through the implementation of a water fee structure and revenue collection system, that will eventually generate sufficient funds to cover all operating costs of producing and delivering water to the various user categories.
2. Regulations concerning the conservation of water will be fully enforced, and water consumption for agricultural purposes regularly monitored.
3. Subsidies towards the cost of well drilling and pump purchases should be re-evaluated. Subsidies for irrigation equipment and water saving technology applications (e.g. increased use of greenhouses for production of vegetables), will be retained.
4. Hydrogeologic studies of principal and secondary deep aquifers will be resumed, in order to increase knowledge of the proven non-renewable water resources in the Kingdom. These studies will include the drilling of exploration and observation wells, pumping tests, water quality determination, and monitoring the aquifers under exploitation by means of field observations and ground water model simulations. Likewise, water management studies of renewable water resources utilization, and feasibility studies for proposed desalination and waste water reclamation projects, will be continued. These study programs will serve to establish a sound data base for completing the National Water Plan.
5. The National Water Plan will be completed, along with the National Water Code and related legal documents for enforcement. The primary aims of the National Water Plan are to maintain a strategic reserve of non-renewable water resources, by emphasizing secure water supplies to the Kingdom's population, its industrial enterprises, and water-efficient agricultural undertakings. Adverse effects on the environment must be minimized.

Main Programs

The main programs in the water sector will be undertaken during the Fifth Plan by three government ministries and agencies. The **Water Affairs Department of MOAW** has three major programs:

- (i) Water resources development, which aims at the development of surface water resources, reclaiming of waste water, and preparation of the National Water Plan based on comprehensive water resources assessment;
- (ii) Drinking water supply systems;
- (iii) Operation and maintenance.

The **Saline Water Conversion Corporation (SWCC)** operates and maintains the desalination plants throughout the Kingdom. SWCC will continue its further development and construction of desalination plants. The most important projects to be undertaken during the Fifth Plan will be the Jeddah-Makkah-Taif plant, the Qunfudah plant, phase three of the Jubail plant, phase two of the Yanbu-Al Madinah plant and the third phase of the Al Khobar plant. The possibility of mobilizing private sector resources for the realization of one or more of these plants, on the basis of build-operate-transfer agreements, will be actively pursued.

Al-Hassa Irrigation and Drainage Authority (HIDA) programs will include operation and maintenance of irrigation and drainage facilities in Al-Hassa and Al-Qatif areas.

The main programs of the **Ministry of Municipal and Rural Affairs (MOMRA)** will include the further expansion, operation and maintenance of the water network, the waste water collection and treatment system, and the installation of water meters.

9.1.5 Fifth Development Plan Targets

A major objective in the water sector during the Fifth Plan period is to reduce the rate of water consumption in the Kingdom. This can be achieved through conservation measures, higher efficiency in the use of water and by switching agricultural production away from highly water intensive crops, especially in areas that depend almost exclusively on non-renewable water resources. In this regard, water pricing has the important dual purpose of promoting much needed water conservation within the various user sectors and of generating additional revenues for the government.

The Fifth Plan will seek to achieve the following targets:

Water Conservation

Total water use in the Kingdom will be reduced by 8 percent, from 16.2 billion cubic meters per year in 1410 to 14.9 billion cubic meters per year in 1415, compared with a total increase of 89 percent during the Fourth Plan period. The reduction in water consumption will be the result of the projected decline in agricultural consumption from 14.6 billion cubic meters per year at the beginning of the Fifth Plan to 12.7 billion cubic meters per year at the end of the Plan period. The change in the consumption rate by agriculture is expected to take place through changing crop patterns, the intensification of water saving techniques and other appropriate measures, all of which will not affect the desirable growth rate of agricultural production or its value added.

Change in Water Balance

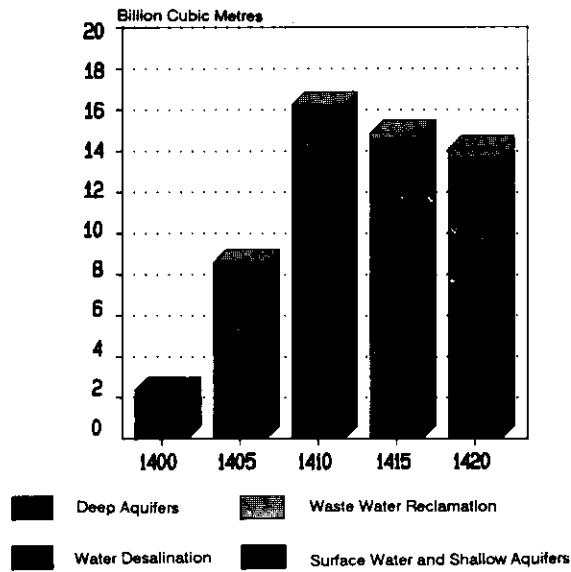
Table 9.2 shows the anticipated change in the national water balance as a result of the conservation measures, with emphasis on a reduction in the consumption of non-renewable water resources, and an increase in the share of all other water resources.

TABLE 9.2

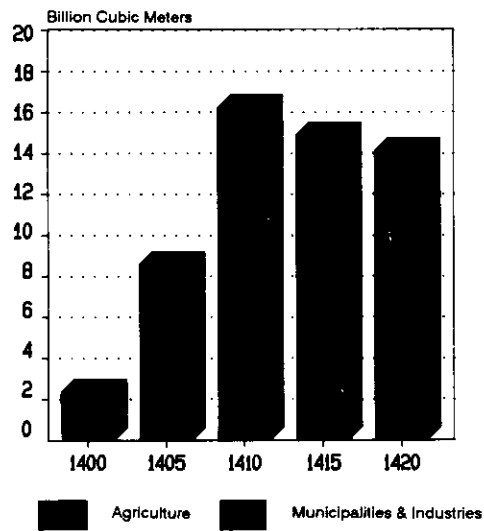
**Water Conservation Impact on National Water Balance
(million cubic meters per year)**

	1410	1415
Water Demand		
Municipal & Industrial	1,650	2,200
Agriculture	14,580	12,675
Total	16,230	14,875
Resources Utilized		
Surface Water & Shallow Aquifers (Renewable Water)	2,100	2,200
Desalinated Water	540	840
Reclaimed Waste Water	110	290
Non-renewable water (deep aquifers)	13,480	11,545
Total	16,230	14,875

Figure 9.1
National Water Balance
Water Resources Utilized



Water Demand



The targeted decrease in water consumption can be achieved, notwithstanding the expected increase in agricultural output, as a result of:

- a rationalization of water consumption patterns;
- the adoption of water-saving techniques, such as drip irrigation and greenhouses;
- a shift to less water-intensive crops.

Water Revenues

Given the effective implementation of related programs and policies, water revenues are projected to reach SR 4 billion in 1415.

Saudiization

In the area of manpower development, non-Saudi manpower will be replaced by Saudis, who will make up 96 percent of total manpower in 1414/1415, compared with 95 percent in 1409/1410.

9.1.6 Financial Allocations: Water Sector

The financial allocations for the water sector during the Fifth Plan are shown in Table 9.3:

TABLE 9.3
Fifth Plan Financial Allocations: Water Sector
(SR million)

Agency	Salaries and Supplies	Operation and Maintenance	Projects	Total
Ministry of Agriculture And Water (Water Affairs)	— *	1,240	3,425	4,665
Saline Water Conversion Corporation	220	3,590	12,988	16,798
Al-Hassa Irrigation and Drainage Authority	595	85	50	730
Total **	815	4,915	16,463	22,193

* Administration expenditures for salaries, supplies and services are included in the agriculture sector (Section 10.1).

** MOMRA expenditures on water, sewerage, rainwater drainage and flood control are shown in Chapter 15.

9.2 ENERGY

9.2.1 Role and Development Objectives

As a result of its eminent position amongst the world's oil producing and exporting countries, the Kingdom has assumed an important role in international trade. In the context of this role and in the conduct of its oil policy, the Kingdom seeks to maintain stable world oil prices and continued supplies of oil to the industrialized countries, with the aim of attaining a balance between producer and consumer interests.

Although the Kingdom's long term objective is to bring about structural change in the economy, by means of a gradual transformation from dependence on oil as a primary source of national income to a multi-resource economy, oil revenues will continue to be the government's main source of income for many years to come. The oil sector will, therefore, continue its development. Although Saudi Arabia possesses the largest share of hydrocarbon proven reserves in the world, the build-up of knowledge about alternative energy technologies and their development are important elements in the Kingdom's long term development strategy. This is particularly true in the case of solar energy for desalination activities and for some agriculture-related ventures.

The following general objectives have been established for energy sector development during the Fifth Plan:

- To conserve and manage hydrocarbon resources for the maximum long term benefit of the Kingdom with due regard to the environmental dimension;
- To rationalize oil companies' activities and to attain greater efficiency and optimal use of resources;
- To ensure that international trading relations and the Kingdom's marketing policies are compatible with the national objectives for oil and gas development;
- To achieve maximum returns from refining and other downstream activities;
- To develop a domestic marketing strategy for lubricating oils and to promote the exports of those lubricants that can be profitable;
- To develop or acquire technologies of renewable and other energy sources which contribute to the realization of national goals;
- To conserve energy and to induce efficiency in the use of oil products on the part of local consumers.

9.2.2 Achievements and Key Issues

Successful exploration activities undertaken during the Fourth Plan period and a re-assessment of existing oil fields have resulted in an increase in the Kingdom's proven oil reserves to an estimated 315 billion barrels in 1989. This has considerably strengthened Saudi Arabia's position as the world's largest holder of oil reserves. Furthermore, Saudi Arabia has played its full part within OPEC in bringing stability to the world oil market.

On the domestic front, the Kingdom has pursued a vigorous policy throughout successive development plans to make optimal use of its oil resources. Nine refineries have been constructed serving both domestic and export markets, in addition to a Kingdomwide distribution network. A modern petrochemical industry has also been established through the construction of 15 industrial complexes which, despite various hurdles, have managed to successfully penetrate world markets with their high quality products. The Kingdom's oil resources have therefore been used to generate higher value added activity and have contributed to the emergence of an industry-oriented generation of Saudi citizens who shoulder a major portion of the tasks of management, operation, maintenance, and development of these industrial complexes, as well as marketing of their products. In order to complete the vertical integration process and to secure essential feedstock supplies for the Kingdom's industrial complexes, the second stage of the non-associated gas gathering program has been completed and further exploration activity undertaken.

Measures were also taken during the Fourth Plan years for completing the transfer of the assets of the Arabian American Oil Company (ARAMCO), which has now become the Saudi Arabian Oil Company (Saudi ARAMCO). In addition, the Saudi Arabian Marketing and Refining Company (SAMAREC) was set up in 1408, as part of the re-organization of the Kingdom's oil industry. Another successful achievement in expanding various aspects of the Kingdom's oil industry has been the joint venture formed by Saudi ARAMCO with the leading U.S. refined oil marketing company 'TEXACO'. The integration of oil production stages achieved through this joint venture, has secured additional marketing capability for the Kingdom's oil sector, which can guarantee its market share, ensure sufficient supplies to consumers and upgrade profitability of the oil refining sector. The achievement made in this respect has, therefore, unequivocally demonstrated the Kingdom's ability to shoulder its responsibilities at domestic, regional and international levels.

During the Fourth Plan, a series of solar energy applied research projects was conducted under the supervision of the King Abdul Aziz City for Science and Technology (KACST). A photo-voltaic solar electric power plant supplying energy to three remote villages was monitored and evaluated. Studies on solar hydrogen production and solar powered desalination were completed. As part of the Kingdom's activities in nuclear energy, a research program on the prevention of radiation was conducted.

Key Issues

Prices and Energy Consumption

Throughout successive development plans it has been the Kingdom's policy to make refined oil products available to domestic consumers at subsidized prices. However, the level and structure of oil product prices in the domestic market are not conducive to energy conservation or rationalization of energy use. Consequently, domestic consumption has been growing at a relatively high rate. Furthermore, under the terms of OPEC agreements, if this trend were to continue it would reduce the share of oil exports in total production, thereby leading to lower potential export revenues. These issues call for a review of the present pricing policy for domestic energy consumption.

Refineries' Product Slate

The demand for refined oil products, both in terms of quantity and quality, is governed by domestic and international market forces, which have recently led to a marked growth in demand for lighter products. This trend requires continued efforts to improve the technical design and increase the efficiency of oil refineries, in order to achieve greater flexibility and responsiveness to market needs for these products, and to improve the economic rates of return in the refining sector.

Consumption of Natural Gas

The past constraint on the availability of associated gas for domestic users has been greatly alleviated during the Fourth Plan period as a result of two factors -- the non-associated gas fields brought into production, and the completion of the second stage of the gas gathering program. Nevertheless, projected future growth in demand for natural gas over the medium to long term requires measures to increase the availability of natural gas, both as a fuel and as a feedstock. A further consideration in this regard is that flexibility in feedstock and fuel inputs can be a design feature of future domestic industries.

Domestic Product Distribution

A large proportion of oil products consumed domestically is being transported overland by tanker trucks. This is both a high cost mode of distribution and has undesirable road safety implications. Measures are therefore needed to develop a cost effective and safe method of distributing oil products, such as constructing additional product pipelines and bulk storage facilities.

9.2.3 Role of the Government and the Private Sector

The role of the Ministry of Petroleum and Mineral Resources in administering most activities in the energy sector will be continued, and will be further enhanced during the Fifth Plan period. However, the Kingdom's energy sector will undergo organizational changes, at

both local and international levels. The Saudi Arabian Oil Company (Saudi Aramco) will assume its role in exploration, development, production and marketing of crude oil. The Saudi Arabian Marketing and Refining Company (SAMAREC) will be responsible for the management and operation of the oil refineries and the marketing of refined products. Petromin subsidiaries currently engaged in blending and marketing of lubrication oil and lubricants will be merged into a single company, the Petromin Lubrication Oil Company ('Petrolube'), which will become the only Petromin company involved in the blending and marketing of lubrication oil and lubricants in both domestic and international markets.

As part of its privatization efforts the government will consider offering shares in SAMAREC for public subscription. The private sector will continue to expand in domestic gasoline and lubricant oil retailing, and in the supply of services, components, construction and equipment to the energy sector.

9.2.4 Policies and Main Programs

The energy sector objectives will be pursued through the following policies:

- Adopt a production policy which, in the long term, reflects the structure of hydrocarbon resources contained in the national reserves;
- Continue to restructure and consolidate the activities of existing companies in order to achieve greater efficiency;
- Apply commercial criteria in all downstream operations and related services;
- Revise domestic oil product prices to reflect production costs;
- Encourage private sector participation in the management and ownership of energy related services;
- Strengthen the Kingdom's role in the organization of the Arab Petroleum Exporting Countries (OAPEC) and the Organization of Petroleum Exporting Countries (OPEC);
- Implement design modifications to existing refineries to allow sufficient flexibility in meeting the level and structure of demand for oil products;
- Increase the availability of natural gas by developing additional sources of non-associated gas and expanding the capacity of the gas gathering program;
- Develop an adequate, efficient and safe domestic storage and distribution network for oil products;

- Conduct applied research in the fields of renewable and other energy resources deemed viable for development in the Kingdom.

Main Programs

These policies will be implemented through a set of programs, foremost among which will be: the operation and maintenance program; petroleum studies and research program; facility and support services development program; solar energy research; and petrochemical research.

9.2.5 Fifth Plan Growth Targets

The value added of the petroleum refining sector is expected to grow at an average annual rate of 5.4 percent during the Fifth Plan period. The other main targets of the energy sector are:

- to construct 334 kms of pipelines per year as part of the petroleum products distribution network;
- to raise the petroleum depots' bulk storage capacity from 21 million barrels in 1409 to 29 million barrels at the end of the Plan period;
- to develop a solar chimney and a solar greenhouse in the context of solar energy research and development, and to undertake seven diverse solar energy related research projects;
- in the area of manpower development, to replace non-Saudi manpower by Saudi nationals during the Fifth Plan period, thus increasing the number of Saudis from 92.5 percent of the total work force in 1409/10, to 95.5 percent in 1414/1415.

9.2.6 Financial Allocations: Energy Sector

The financial allocations for the energy sector during the Fifth Plan period are shown in Table 9.4.

TABLE 9.4

**Fifth Plan Financial Allocations: Energy Sector
(SR million)**

Agency	Salaries and Supplies	Operation and Maintenance	Projects	Total
Ministry of Petroleum and Mineral Resources	379.0	20.0	224.0	623.0
General Organization for Petrol- eum and Mineral Resources (Petromin)	296.5	13.5	—	310.0
Total	675.5	33.5	224.0	933.0

Note : 1. No allocation is made on the government budget to cover Petromin's project expenditure which is estimated at about SR 11 billion.

2. Allocations for alternative energy R&D have been included in KACST allocations (Chapter 12).

9.3 MINERAL RESOURCES

9.3.1 Role and Development Objectives

The territory of the Kingdom contains abundant minerals and metals, as well as hydrocarbon mineral resources. Although non-oil mineral resources are far less significant than the latter, their development has the potential to contribute to the economic diversification of the Saudi economy. Exploration and development of non-hydrocarbon mineral resources has, therefore, been a consistent objective of the government throughout successive Development Plans. The fifth basic strategic principle states in this respect:

'Developing economically promising natural resources, such as the exploration of mineral and sea resources, the mapping of their location, their further development and utilization, and the processing of available natural gas to the maximum extent possible.'

Further development of mining activities is both possible and desirable, as it will have several positive effects on the national economy:

- it will constitute a source of additional revenue for the government;
- it will generate additional exports and contribute to export diversification;
- it will create new opportunities for the creation of industrial activities in the Kingdom;
- it will attract private investment into mining activities and associated manufacturing industries;
- it will contribute to harmonious regional development and to an improvement in the regional balance.

There are two main components in the minerals sector:

- the quarrying of building materials for use in the construction industry;
- the extraction of metals for further processing and industrial use.

The first segment has received greater attention since the early stages of development, predominantly as a result of private initiative and in response to the needs of the domestic construction industry. The extraction of metals has also been supported by the government, and as a result, two mines started production during the Fourth Development Plan period. Together, these two activities accounted for 1.8 percent of non-oil GDP in 1409/1410, and employed some 3,500 workers.

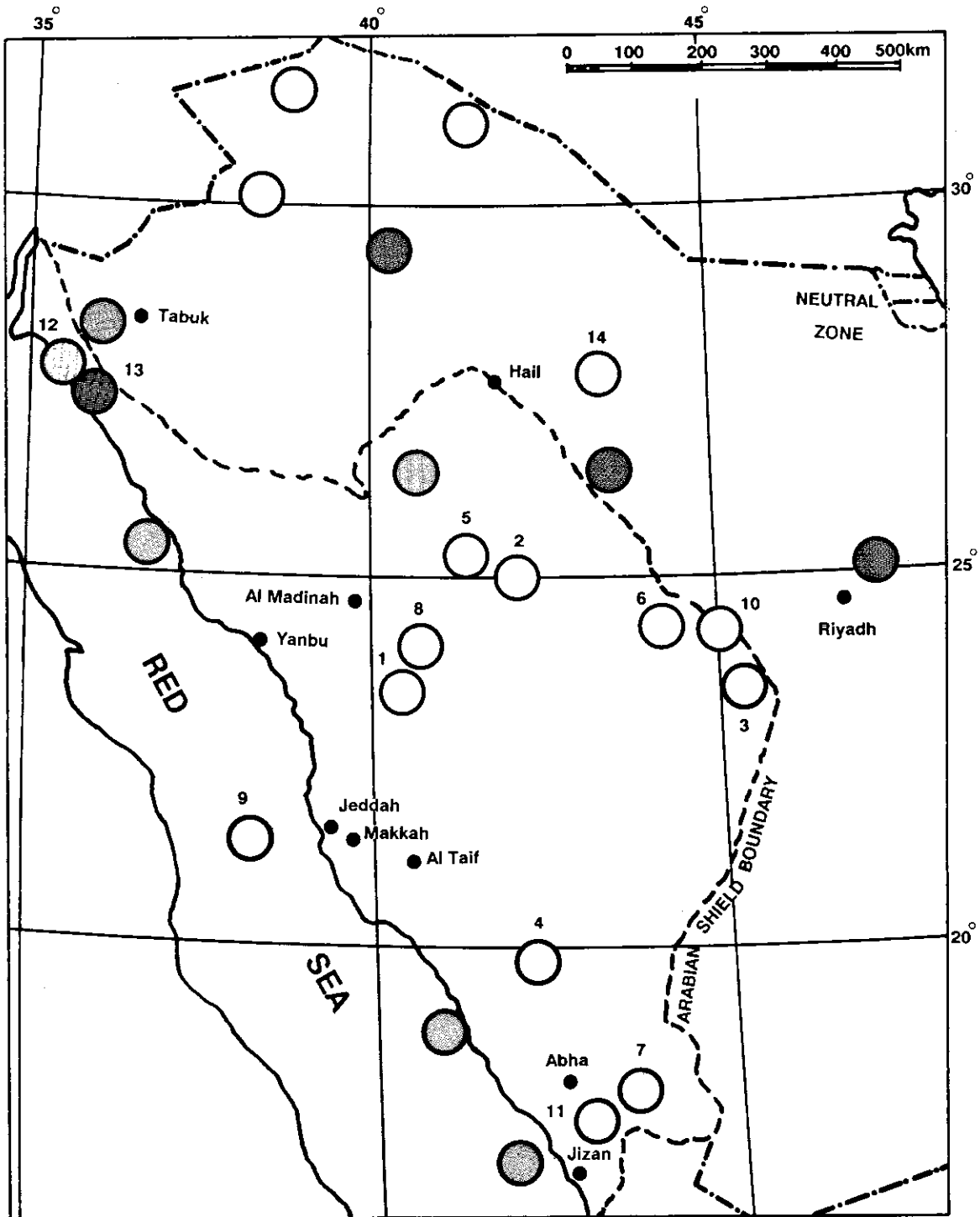
9.3.2 Achievements and Key Issues

Through considerable government efforts during previous Development Plans, a sizeable number of mineral deposits have been explored. Within the context of these endeavors, enormous knowledge of the Kingdom's geology and mineral potential has been gained, and as a result, a data base has been established that has helped to identify a number of mineral projects and deposits that give a sound basis for the development of the Kingdom's mining industry.

A start was made at the end of 1408, when the first gold mine, Mahad ad Dahab, achieved full production. The second gold mine, Sukhaybarat, is scheduled to reach that stage in 1411.

Figure 9.2

METALLIC AND INDUSTRIAL MINERALS
Major Deposits



LEGEND

- | | | | | | | | |
|-------------------------------|-------------|-------------------------------|-------------|-------------------------------|--------------------------|---|-------------|
| ○ | GOLD-SILVER | ○ | COPPER-ZINC | ● | NIObIUM-TANTALUM-URANIUM | ○ | PHOSPHATE |
| 1. Mahad ad Dahab (Au,Ag,Cu,) | | 7. Al Masane (Zn,Ag,Cu,Au) | | 12. Ghurayyah (Nb,Ta,I,Th,U,) | | | |
| 2. Sukhaybarat (Au) | | 8. Jabal Sayid (Cu) | | ● | IRON | ● | MAGNESITE |
| 3. Al Amar (Au,Zn) | | 9. Altantis II (Zn,Ag,Cu,Au,) | | ○ | 13. Wadi Sawawin | ○ | POTASH |
| 4. Al Hajar (Au) | | 10. Khnaiguiyah (Zn,Cu,) | | ○ | ALUMINIUM | ● | SILICA SAND |
| 5. Nuqrah (Ag,Au,Zn,Cu,) | | 11. Kutam (Cu,Au,Ag,) | | | | | |
| 6. Samrah (Ag,Au,Pb,) | | | | | | | |

Note: Producing quarries for Cement, Clays, Structural Materials and Ornamental Stones are not shown.

Key Issues

In accordance with the directives of the Custodian of the Two Holy Mosques, as well as with the strategic principles, an effort will be made in the Fifth Development Plan period to overcome the administrative and legal complications that still constrain private sector participation in this sector. Issuance of the regulations governing mining activity, as well as the mining concessions that are currently under study, will be actively pursued.

Due to the fact that the Saudi mining industry is still at the infancy stage of its development and lacks the necessary know-how, every possible effort will be made to promote the participation of specialized international foreign companies in investment in the Kingdom to facilitate the transfer of know-how. Mining and tax laws will also be modified and a business-like approach will be adopted with a view to keeping abreast with on-going progress in this field.

9.3.3 Role of the Government and the Private Sector

The respective roles of the government and the private sector are determined by the Mining Code, which confirms that the government will continue to play an important administrative and regulatory role, but the driving force for the development of mining activities will be provided by private enterprise. The government will assume its role through the Ministry of Petroleum and Mineral Resources, which will undertake basic geologic works (like geological surveys), mineral exploration and development, in addition to supervision and follow up of quarrying and mining activities. The relative importance of the basic geological work will increase in the Fifth Development Plan period, as the private sector is expected to become increasingly involved in exploration activities, thus relieving the government of some of its current tasks.

The Ministry of Petroleum and Mineral Resources will promote and support private mineral investment, and regulate and monitor investment in order to assure its contribution to national economic development. The Third Basic Strategic Principle states in this respect:

‘Acquainting investors regularly with results of official studies relating to mining; encouraging investors to undertake the utilization and development of available minerals; allowing companies to invest in minerals that have been discovered; and encouraging investment in mining through such means as the provision of basic infrastructure.’

Mining activity in the Kingdom is at an early development stage. The government, therefore, through Petromin, has embarked directly into the production of minerals, as in the case of the Mahad ad Dahab project. The 100 percent government funded and managed Mahad ad Dahab project has so far not been able to fulfill all expectations, namely efficient performance and an acceptable level of profitability. Some problems in the gold project can be attributed to the fact that this is the first experience with a mining operation for a petroleum and refining organization.

Under the current legal system as well as in the proposed reform of the Mining Code, most mining ventures will have varying degrees of government equity participation. Such participation has to be held and exercised by a government body with special experience in and concentration on mineral investment. In line with the current reorganization in the role and functions of Petromin, its minerals branch activities will also be reassessed. In this context, and in view of the above mentioned need, consideration will be given to the establishment of a separate, independent 'MINCO' (mining company) to act as a holding company for government participation in mining projects.

9.3.4 Mineral Resources Policies and Main Programs

In order to meet the unresolved issues and eliminate obstacles to the attainment of the sector's long-term objectives the following policies will be implemented:

- Carry out the general geologic survey work and update geologic information; continue the search and exploration of mineral deposits applying modern methods and technologies; and evaluate the technical and economic feasibility of promising mineral deposits.
- Advise the community about risks that result from earthquakes, land subsidence, and volcanic activity.
- Encourage the private sector to participate in and invest in the exploration, development, and exploitation of mineral deposits; acquaint potential investors regularly with the results of public efforts in mineral exploration; promote policies, regulations, and laws governing mining and related activities to create a conducive environment for investments; and ensure compliance with laws and regulations.
- Promote small- and medium-scale mining by providing financial and technical assistance to private enterprises, and by purchasing mineral ores and concentrates; support the development of mining through assistance in the provision of the necessary basic infrastructure; and encourage mining development through support services and downstream processing industries.
- Develop the Sukhaybarat mine together with the joint-venture partner, and optimize production and improve profitability at the Mahad ad Dahab gold mine.
- Increase efficiency of the regulatory and supervisory functions.
- Continue to train Saudi nationals in all aspects of sectoral activities, thereby increasing their abilities and skills to replace non-Saudi manpower.

Main Programs

Implementation of the proposed policies will be pursued through several programs, including:

- **Geological Services**, whose objective is the production of the basic geological data and information, as well as the provision of the required geologic services to the community. It will include geologic mapping as well as geologic studies for civil engineering, hydrogeology, and geologic hazards. The probability of earthquakes, volcanic eruptions and land subsidence will be investigated and monitored.
- **Mineral Exploration**, whose prime objective is the discovery and investigation of mineral deposits.
- **Mining Development** will be carried out, under which ore reserves will be studied, and mining and beneficiation characteristics of selected deposits investigated, particularly those of special national interest that have not yet attracted private partners.
- **Regulatory Supervision**, under which mining policies, laws and regulations governing mineral activities will be enforced. The organization of the sector will be reassessed in the light of the revised Mining Code. An investment promotion department will be established. The DMMR Licence and Concessions Department will evaluate applications for reconnaissance permits, exploration licenses and mining leases and assist interested parties in the preparation of applications for the legal documents.

Other programs include the provision of Support Services and Manpower Development.

A special program is devoted to the reorganization of Petromin's minerals branch. The Mahad ad Dahab project will be transformed into an independent profit center with a totally commercial work approach. Petromin's role will be similar to its function in SAMAREC, that of a holding company. The same approach will apply to the Sukhaybarat gold project that is being developed by the Saudi Company for Precious Metals, a Petromin joint-venture with a Swedish mining company.

9.3.5 Growth During the Fifth Plan Period

The quarrying segment of the industry is expected to expand in the Fifth Plan period because of the expected recovery in domestic construction, as well as continuing substitution of imports of foreign construction materials. Value added growth is targeted to reach 4.0 per cent per year.

The other segment of the mining sector (i.e. extraction, transformation and utilization of metals) became active in 1408, when the first gold mine, Mahad ad Dahab, started full production. The second mine, Sukhaybarat, is scheduled to begin production in 1411, and one or two other locations that are already well explored might reach that stage before the end of the Fifth Plan period. Within the context of manpower development at the DMMR, Saudi nationals will replace non-Saudi manpower, and Saudiization will be increased from 99.5 percent in 1409/1410 to 100 percent in 1414/15.

9.3.6 Financial Allocation: Mineral Resources

The financial allocation for the mineral resources sector in the Fifth Plan is shown in Table 9.5 below:

TABLE 9.5

**Fifth Plan Financial Allocation: Mineral Resources
(SR million)**

	Salaries and Supplies	Operation and Maintenance	Projects	Total
Ministry of Petroleum and Minerals Resources (Deputy Ministry of Mineral Resources)	206.8	85.0	1,108.0	1,399.8