

Chapter XVIII

Public Utilities

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I. INTRODUCTION

The development of public utilities, namely, water supply, sewerage, and urban drainage and flood mitigation programmes, helps to promote economic growth and improve the quality of life. During the Fourth Malaysia Plan period, the implementation of water supply programme was given priority to meet the increasing water requirements, both for domestic and industrial consumption. The public sector investment in the other subsectors was aimed at the completion of projects and major components of ongoing schemes as well as the initiation of a number of new projects.

The strategies for the development of public utilities during the Fourth Plan period will continue to be adopted in the Fifth Malaysia Plan. In order to meet the rapidly increasing domestic and industrial water demands as well as to reduce conflict in water uses, an integrated and comprehensive approach towards the planning, development, and the management of water resources will be introduced. In addition, the source development for several water supply projects involving interstate and interbasin water transfer will be undertaken as an integral part of multipurpose water projects. Greater private sector involvement in the construction as well as operation and maintenance of water supply and sewerage projects will be encouraged to reduce public sector investment.

II. PROGRESS, 1981-85

During the Fourth Plan period, the development of public utilities was accorded priority to help promote economic growth and improve the standard of living. Emphasis was also given to the implementation of water supply programme to meet the increasing water requirements, for domestic and industrial consumption, as well as to optimize the utilization of available water resources. With regard to sewerage development, the implementation of centralized sewerage projects in several state capitals and major towns was completed.

Water supply

In line with the policy of the Government to provide safe water to all as well as to support the industrial development of the country, the implementation of water supply programme was accelerated during the Fourth Plan period. Arising from this, the total treatment plant production capacity was increased by 59.7 per cent, from 2,641.7 million litres per day (mld) in 1980 to 4,218.6 mld in 1985, compared with 63.8 per cent increase in water demand, from 2,281.3 mld to 3,737.3 mld, as shown in Table 18-1. The excess capacity in certain states was mainly attributed to the completion of several water supply schemes with greater treatment plant production capacity initiated during the Third and Fourth Plan periods and the development of other available resources. In terms of distribution by state, substantial increases in total production capacity were recorded in Johor, Kelantan, Melaka, Sabah, and Terengganu. The development of water supply in Kedah, Perlis, and Selangor, however, was unable to match the increase in demand due to various constraints such as lack of suitable water sources and rapid urbanization, industrialization, and migration in the Klang Valley region.

TABLE 18-1
MALAYSIA: WATER SUPPLY AND DEMAND, 1980-90
(mld.)

| State | 1980 | | 1985 | | 1990 | |
|-----------------------|-------------------------------------|---------|-------------------------------------|---------|-------------------------------------|---------|
| | Treatment plant production capacity | Demand | Treatment plant production capacity | Demand | Treatment plant production capacity | Demand |
| Johor | 212.0 | 236.6 | 426.5 | 398.6 | 810.1 | 703.9 |
| Kedah | 142.9 | 162.9 | 260.0 | 287.1 | 569.0 | 534.3 |
| Kelantan | 51.9 | 51.9 | 113.0 | 103.7 | 201.4 | 180.1 |
| Melaka | 79.2 | 79.6 | 232.7 | 140.6 | 240.7 | 237.0 |
| Negeri Sembilan | 118.3 | 97.8 | 213.0 | 182.0 | 387.8 | 325.6 |
| Pahang | 113.8 | 113.8 | 221.7 | 199.3 | 622.5 | 315.4 |
| Perak | 441.4 | 318.5 | 526.7 | 468.2 | 830.5 | 696.1 |
| Perlis | 15.0 | 6.8 | 19.3 | 25.0 | 66.9 | 41.2 |
| Pulau Pinang | 291.2 | 268.5 | 464.1 | 342.6 | 631.9 | 551.0 |
| Sabah ¹ | 124.6 | 106.9 | 318.0 | 188.0 | 556.8 | 362.8 |
| Sarawak | 157.0 | 101.5 | 267.0 | 233.0 | 532.2 | 334.0 |
| Selangor ² | 854.9 | 707.8 | 1,037.0 | 1,098.4 | 1,895.1 | 1,768.0 |
| Terengganu | 39.5 | 28.7 | 119.6 | 71.4 | 332.1 | 229.2 |
| Malaysia | 2,641.7 | 2,281.3 | 4,218.6 | 3,737.3 | 7,677.0 | 6,278.6 |

Sources: Ministry of National and Rural Development.
Water Supply Division, Public Works Department.

Notes:

¹ Includes the Federal Territory of Labuan.

² Includes Federal Territory of Kuala Lumpur.

Although most states had surplus supply of water, shortages occurred in certain parts of the country, particularly in pockets of urban areas and in areas where there were constraints in treatment and storage capacities and distribution system, and where there were shortages of surface and groundwater sources. The restricted transfer of excess water among states further aggravated this problem. The completion of several urban water supply projects, initiated during the Third and Fourth Plan periods, however, had overcome the water shortages previously encountered in several localities, such as Muar and Segamat in Johor as well as Machang, Pasir Mas, Pasir Puteh, Tanah Merah, and Tumpat in Kelantan.

Consistent with the efforts of the Government to enable more rural populace to have access to water supply, about 2,300 rural water supply schemes were implemented. These projects with a total production capacity of 370 mld benefitted 1,800,000 people, representing 60 per cent achievement of the Fourth Plan target. In addition, improvements were also made in the level of service to existing consumers.

During the Fourth Plan period, a number of non-surface water schemes were implemented in remote areas to supplement the rural water supply system based on surface water sources and to enable more people to benefit from water supply facilities. A total of 5,600 wells fitted with hand-pumps to tap groundwater potentials were implemented, mainly in Kedah, Kelantan, Perak, and Terengganu. In addition, 420 wells with house connections were constructed in Peninsular Malaysia, while 14,300 rain water collection system were completed, mainly in the remote and coastal areas of Sabah and Sarawak. About 850 gravity water supply schemes and wells with reticulation systems were also developed throughout the country. The implementation of these programmes benefitted an additional 745,000 consumers.

Water supply development was expanded to new land schemes under the Federal Land Development Authority (FELDA) and the regional development authorities (RDAs) areas. During the 1981-85 period, 25 projects with a total treatment plant capacity of 38 mld in 55 FELDA schemes were implemented to provide 25,500 settler families with direct water supply facilities, compared with the target of 74 projects with a production capacity of 45 mld in 116 FELDA schemes, benefitting 30,000 settler families. In addition, standpipes and other forms of temporary supplies were provided in 19 FELDA schemes, benefitting an additional 4,500 settler families. In RDA areas, seven projects were constructed to provide treated water to an additional 46,800 families.

In 1980, 58.7 per cent of the total population were served with safe water. In the urban and rural areas, the coverage achieved were 89 per cent and 42.9 per cent, respectively, as shown in Tables 18-2 and 18-3. By 1985, the coverage for the urban population increased to 93.1 per cent, while that of the rural population was 57.6 per cent, giving a total population coverage of 70.9 per cent. This represented

TABLE 18-2
MALAYSIA: URBAN WATER SUPPLY COVERAGE,
1980-90

| State | 1980 | | 1985 | | 1990 | |
|-----------------------|-----------|------|-----------|-------|-----------|-------|
| | Persons | % | Persons | % | Persons | % |
| Johor | 508,520 | 87.0 | 669,779 | 91.6 | 865,152 | 96.0 |
| Kedah | 146,250 | 90.0 | 174,705 | 95.0 | 203,742 | 98.0 |
| Kelantan | 145,058 | 58.0 | 198,705 | 65.0 | 283,500 | 75.0 |
| Melaka | 107,310 | 98.0 | 114,400 | 100.0 | 120,400 | 100.0 |
| Negeri Sembilan | 163,618 | 86.8 | 207,890 | 89.3 | 263,083 | 92.7 |
| Pahang | 194,948 | 92.0 | 241,205 | 95.0 | 300,076 | 98.0 |
| Perak | 566,208 | 96.0 | 624,652 | 98.0 | 677,853 | 99.0 |
| Perlis | 11,880 | 90.0 | 15,252 | 93.0 | 20,090 | 98.0 |
| Pulau Pinang | 441,544 | 97.0 | 555,072 | 98.0 | 677,457 | 99.0 |
| Sabah ¹ | 208,494 | 99.0 | 289,400 | 100.0 | 388,300 | 100.0 |
| Sarawak | 207,234 | 87.0 | 281,580 | 95.0 | 358,974 | 98.0 |
| Selangor ² | 1,354,860 | 90.0 | 1,876,109 | 94.5 | 2,505,468 | 98.0 |
| Terengganu | 175,350 | 75.0 | 254,150 | 85.0 | 364,420 | 95.0 |
| Malaysia | 4,231,274 | 89.0 | 5,502,899 | 93.1 | 7,028,515 | 96.5 |

Source: Water Supply Division, Public Works Department.

Notes:

¹ Includes the Federal Territory of Labuan.

² Includes the Federal Territory of Kuala Lumpur.

TABLE 18-3
MALAYSIA: RURAL WATER SUPPLY COVERAGE,
1980-90

| State | 1980 | | 1985 | | 1990 | |
|-----------------------|-----------|------|-----------|------|-----------|------|
| | Persons | % | Persons | % | Persons | % |
| Johor | 296,912 | 28.0 | 688,276 | 61.3 | 847,325 | 72.9 |
| Kedah | 502,044 | 52.4 | 592,579 | 57.7 | 835,138 | 76.4 |
| Kelantan | 110,109 | 17.0 | 216,180 | 30.0 | 410,972 | 51.6 |
| Melaka | 249,970 | 70.0 | 308,907 | 81.7 | 383,420 | 95.6 |
| Negeri Sembilan | 255,684 | 66.0 | 294,450 | 75.0 | 353,512 | 90.7 |
| Pahang | 277,441 | 47.0 | 484,120 | 65.0 | 889,586 | 94.9 |
| Perak | 672,375 | 55.0 | 972,900 | 75.0 | 1,092,959 | 80.6 |
| Perlis | 61,020 | 45.0 | 74,350 | 50.0 | 112,015 | 68.7 |
| Pulau Pinang | 392,340 | 78.0 | 410,890 | 85.0 | 392,680 | 87.5 |
| Sabah ¹ | 152,010 | 18.0 | 376,238 | 38.0 | 614,607 | 54.4 |
| Sarawak | 222,580 | 20.0 | 411,312 | 33.0 | 656,186 | 47.3 |
| Selangor ² | 648,180 | 65.0 | 722,262 | 73.0 | 792,085 | 82.1 |
| Terengganu | 77,325 | 25.0 | 135,120 | 40.0 | 329,719 | 89.8 |
| Malaysia | 3,917,990 | 42.9 | 5,687,584 | 57.6 | 7,710,204 | 72.8 |

Sources: Ministry of National and Rural Development.
Water Supply Division, Public Works Department.

Notes:

¹ Includes the Federal Territory of Labuan.

² Includes the Federal Territory of Kuala Lumpur.

a near achievement of the Plan target to provide safe water supply to 72.9 per cent of the total population. Certain states, however, continued to have low rural coverage due mainly to the remoteness of some villages and problems associated with water distribution.

There is currently no uniformity in the water supply administrative system in the country. The operation and maintenance of water supply in various states is managed by either a Water Board, a Water Department or the Public Works Department. In order to increase the efficiency of water supply development and management in the country, efforts had been taken to revamp and improve the existing system. A water supply department was established in Negeri Sembilan, Perak, Selangor, and Terengganu. Johor also initiated efforts towards the establishment of such department. In addition, the commercial accounting system was implemented in Melaka, Pulau Pinang, and Terengganu. Efforts towards its adoption were pursued by Johor, Kelantan, Perak, and Selangor. In view of the increased capital cost of water supply projects and the rising operation and maintenance costs, water rates in all states were revised during the Fourth Plan period to generate additional revenues to meet these costs.

During the 1981-85 period, a number of feasibility studies for specific water supply schemes, such as the Terengganu Water Resources Study, were undertaken. With regard to rural water supply, detailed investigations and preparation of development programmes were carried out and completed in 1984. Feasibility and preliminary engineering studies of the Sungai Johor water resources were initiated in 1984 for the purpose of international water transfer, under the economic co-operation between the Governments of Malaysia and Singapore. This study identified various options for the development of Sungai Johor water resources to meet the future requirements of both countries.

Water resources

With respect to water resources development, several feasibility studies on water resources development were completed. One of them was the National Water Resources Study which was initiated in late 1979 and completed in 1982. The main objective of this study was to establish a basic framework for the orderly planning, implementation, and the management of water resources development programmes for the country, consistent with the overall national socio-economic development objectives. The study recommended the construction of more storage dams to retain high flows during wet seasons for release in dry seasons.

In line with the recommendations of the National Water Resources Study, feasibility studies for the water stress regions of Kedah, Perlis, and Pulau Pinang as well as Melaka, Negeri Sembilan, and North Johor were completed in 1984. The South Johor Regional Water Resources Study and the updating of the 1980 Klang Valley Water Resources Study were completed in 1985.

Sewerage

The problems of pollution of surface and groundwater sources, coastal waters, and beaches has increased as a result of rapid urbanization, industrialization, and overall economic development. Discharge of sewage was identified as a contributor to the high incidence of water-borne communicable diseases as well as the major source of pollution. This problem, however, could be overcome by the provision of centralized sewerage systems and the improvement of existing sanitation systems.

By the end of the Fourth Plan period, centralized sewerage systems were available in Bukit Mertajam, Butterworth, Georgetown, Kota Kinabalu, Kuala Lumpur, and Shah Alam. These systems which were implemented by the local authorities, however, were not fully extended to serve all households within the urban areas. By 1985, about 152,200 households or 5.3 per cent of the total population of the country were provided with centralized sewerage systems, compared with 4 per cent in 1980. In addition, the construction of new housing projects with communal centralized sewerage facilities undertaken both by the private and quasi-government sectors, has benefitted a considerable number of households.

In line with the objective of the Government to provide centralized sewerage systems for state capitals and major towns, detailed designs for the Bangi, Ipoh, Kota Kinabalu, Kuala Terengganu, Sandakan, and Tawau sewerage projects were completed. Feasibility studies and preliminary engineering designs for eight other towns were prepared for future implementation.

With regard to other types of sewerage system, 30.6 per cent of the total population of the country were provided with flush toilets connected to septic and imhoff tanks or other communal centralized sewerage systems in 1985, compared with the Fourth Plan target of 29.1 per cent. In addition, 39.2 per cent of the overall population, mainly in the rural areas, were provided with pour-flush toilets in 1985, compared with 30.3 per cent in 1980.

With the increasing usage of modern methods of sewage disposal, the percentage of the total population using buckets, pits, and hanging latrines declined substantially from 27.5 per cent in 1980 to 14.7 per cent in 1985. The proportion of the population still without any sewage disposal system also decreased from 16.4 per cent in 1980 to 10.2 per cent in 1985.

Urban drainage and flood mitigation

In line with the efforts of the Government to improve the socio-economic conditions and quality of life of the urban dwellers, and considering that a number of urban centres were subjected to frequent floodings, drainage master plans and feasibility studies were undertaken for Alor Setar, Bintulu, Johor Bahru, Kuantan, Melaka, and Port Klang. These studies were mainly aimed at formulating both short and long-term solutions to urban flooding problems. Detailed engineering designs for the Kuala Terengganu and Seremban urban drainage projects were completed in 1985.

The implementation of the Kuala Lumpur Flood Mitigation Project, initiated in 1973, continued into the Fourth Plan. The enlargement of the existing Klang Gates Dam, a component of the project, was completed in 1980 while the construction of the Batu Dam which will also supply water to the Federal Territory of Kuala Lumpur and the canalization and revetment works of the Sungai Batu, Sungai Gombak, and Sungai Klang were carried out during the Plan period.

The construction of Batu Anam Flood Mitigation Project was completed in 1984, while the Klang-Port Klang, Kota Bharu, and Pekan schemes continued to be implemented. In addition, detailed design of the Seremban Flood Mitigation Project was completed in 1983, while that of the Kangar scheme was initiated in 1984.

III. PROSPECTS, 1986-90

The policies and strategies for the development of public utilities adopted in the Fourth Plan will be maintained. Priority will continue to be accorded to the implementation of water supply programme. In addition, an integrated and comprehensive approach towards the planning, development, and the management of water resources will be introduced to optimize the use of available water resources. Where possible, such projects will be developed as multipurpose schemes on an interstate and interbasin basis. The development of centralized sewerage programme will be confined to state capitals, major towns, and popular tourist resorts, while alternative low-cost systems using appropriate technologies will be developed, where feasible. In line with the Government policy to involve the private sector in public sector development programmes and in view of the limited public sector financial resources, active private sector participation will be encouraged in the construction, operation, and maintenance of public utilities.

Water supply

During the Fifth Plan period, the planning of water supply and water demand will be further co-ordinated. Water supply authorities will be informed of the water requirements of industries as the availability of adequate and reliable water for industrial use is crucial.

In order to meet the increasing water requirements for domestic and industrial uses, which is projected to increase by 10 per cent per annum during the Plan period, the construction of ongoing water supply schemes such as the Ahning Stage I, Johor Bahru Phase IA, Pulau Langkawi, Sungai Semenyih, and the South Coastal Terengganu projects will be completed. In addition, the construction of new schemes, namely, the Bintulu Phase II, Kluang, Labuan, and Muar Phase II will be initiated.

The implementation of ongoing rural water supply projects will be completed during the Plan period. Three new schemes will also be constructed in the *Keselamatan dan Pembangunan* areas (KESBAN). In line with the efforts of the Government to enable more rural populace, especially those in remote areas, to have greater access to water supply, 174 projects will be implemented on a turnkey basis throughout the country. Out of these, 103 are new source works, six are improvements to existing treatment plants, 63 involve laying of pipelines, and the remaining are research schemes involving drilling and exploration for groundwater sources in Perlis and Sarawak. In addition to improving the levels of service to existing beneficiaries, the implementation of these programmes, for which the allocation has been increased fourfold compared with the Fourth Plan provision, will benefit about 2,022,600 new consumers.

The provision of water supply infrastructure in FELDA schemes and the RDA areas will be further expanded. During the Fifth Plan period, 68 water supply projects will be implemented to meet the needs of 30,000 new settler families in 184 FELDA schemes. In addition, six water supply projects with a total production capacity of 75 mld will be constructed in RDA areas to benefit a further 257,000 consumers.

A number of feasibility studies, such as the Johor and Pahang water resources studies, will be carried out during the 1986-90 period, while the joint study of Sungai Johor water resources will be completed in 1986. In addition, investigations on groundwater potentials will be carried out with a view to supplementing surface water resources. A pre-investment study on groundwater development will be initiated in 1986 for the coastal swampy areas of Sarawak where its water sources are affected by saline intrusion. In cognisance of the problem of unaccounted for water, which is as high as 45 per cent in some states, a study on water losses and wastage will be undertaken.

With the accelerated implementation of water supply programme envisaged during the Fifth Plan period, the total treatment plant production capacity will be further increased from 4,218.6 mld in 1985 to 7,677.0 mld in 1990. The water demand is anticipated to increase from 3,737.3 mld to 6,278.6 mld in the respective years, as shown in Table 18-1.

The implementation of water supply projects during the Fifth Plan period will increase the total population with access to safe water by 11.5 per cent. Consequently, 82.4 per cent of the total population will be provided with water by

1990 compared with 70.9 per cent in 1985. The urban water supply coverage is targetted to improve from 93.1 per cent in 1985 to 96.5 per cent in 1990 while the rural coverage from 57.6 per cent to 72.8 per cent.

Water resources

Water resources in practically all major demand areas has been developed or committed for use. There is, therefore, a need to undertake water resources development on a larger scale in future to meet the rapidly increasing domestic and industrial water demands throughout the country. The development of water resources in future will increasingly be undertaken on a regional basis and where possible, such projects will be designed for multipurpose uses. In order to facilitate the development of water resources, the Government will adopt the principles of sharing water amongst states and emphasize the development of interstate projects. With regard to the uses of multipurpose schemes, the highest priority will be accorded to domestic and industrial uses, followed by agricultural use, water dependent activities, namely, mining, fishing, power generating, and navigating, and lastly, recreational use. In addition, the Government will introduce legislation to improve co-ordination in water resources planning and its relation to landuse planning as well as to enable the smooth and timely development of interstate and multipurpose projects.

Sewerage

During the Fifth Plan period, the development of centralized sewerage programme will be confined to state capitals, major towns, and popular tourist resorts, while alternative low-cost systems using appropriate technologies will be developed, where feasible. A National Sewerage Policy will be formulated to co-ordinate the planning and implementation of sewerage development. The sewerage projects in Bukit Mertajam, Butterworth, and Labuan will be completed, while construction of the Ipoh, Kota Kinabalu, and the Seremban sewerage schemes will be initiated in 1986. Implementation of Bintulu Sewerage Project is expected to commence in 1987.

The detailed designs for the Johor Bahru, Klang, Kuala Lumpur Phase II, and Melaka sewerage projects as well as the sewerage and drainage master plans and feasibility studies for Kota Bharu, Kuching, and Muar will be carried out. In line with the efforts of the Government to promote tourism, sewerage projects as part of the infrastructure facilities required will be upgraded at two popular tourist resorts, namely, the North Beach in Pulau Pinang and Port Dickson in Negeri Sembilan. During the Plan period, the North Beach project will be implemented while the detailed engineering design of the Port Dickson scheme will be prepared.

The implementation of these projects is expected to provide 6.4 per cent of the total population of the country with centralized sewerage facility by 1990. The

possibility of privatizing the construction, operation, and maintenance of sewerage systems will be considered with a view to reducing public sector involvement.

With the implementation of new sanitation programmes, the proportion of the population using the flush and pour-flush toilets will increase from 35.9 per cent and 39.2 per cent in 1985 to about 42.5 per cent and 48.5 per cent, respectively, by 1990. Efforts will also be taken to phase out the buckets, pits, and hanging latrines, and replace them with acceptable sanitation systems. The total coverage of households using modern methods of sewage disposal is targetted to increase from 75.1 per cent in 1985 to about 91 per cent by 1990.

In view of the high capital cost in implementing centralized sewerage systems, alternative low-cost systems using appropriate technologies will be developed. Towards this end, further studies and research will be carried out. Efforts will be taken to encourage industries to pretreat industrial wastes before channelling to sewerage treatment plants.

Urban drainage and flood mitigation

The construction of ongoing flood mitigation projects for the Klang, Kota Bahru, Kuala Lumpur, and Pekan will be continued. The implementation of the flood mitigation schemes for Bayan Lepas, Ipoh, Kangar, Kuala Terengganu, and Seremban will be initiated in 1986. An urban drainage and flood mitigation master plan and feasibility study for Cukai in Terengganu will also be carried out.

IV. ALLOCATION

The development allocation and estimated expenditure during the period 1981-85 and the allocation for the period 1986-90 for public utilities are as shown in Table 18-4.

TABLE 18-4
MALAYSIA: PUBLIC DEVELOPMENT EXPENDITURE
FOR PUBLIC UTILITIES, 1981-90
(\$ million)

| <i>Programme</i> | <i>Fourth Plan allocation, 1981-85</i> | <i>Estimated expenditure, 1981-85</i> | <i>Fifth Plan allocation, 1986-90</i> |
|--|--|---|---|
| Water supply | 2,137.91 | 1,827.95 | 3,125.77 |
| Urban | 1,791.71 | 1,510.11 | 1,695.77 |
| Rural | 346.20 | 317.84 | 1,430.00 |
| Sewerage | 217.41 | 212.24 | 178.77 |
| Urban drainage and flood mitigation | 15.75 | 15.52 | 159.27 |
| Total | 2,371.07 | 2,055.71 | 3,463.81 |

V. CONCLUSION

In pursuance of the objectives of the Government to promote economic growth and improve the quality of life, the development of public utilities, which was accelerated during the 1981-85 period, will continue to be emphasized during the Fifth Plan period. The implementation of the water supply programme will be continued to increase coverage, especially in rural areas, to ensure adequate supply to industries and households, and to improve the levels of service to existing consumers. With respect to sewerage as well as urban drainage and flood mitigation programmes, investment by the public sector will be focussed upon the continuation and completion of existing schemes and the initiation of several urgent projects.

Privatization of the construction, operation, and maintenance of public utilities will be given due consideration. In addition, studies and research on water supply and alternative low-cost sewerage and sanitation systems using appropriate technologies will be carried out.

