Chapter IX

Environment

CHAPTER IX

Environment

I. INTRODUCTION

The preservation and protection of the environment against both overexploitation of natural resources and pollution of the environment will become more important during the Fifth Malaysia Plan Period *inter alia* to support the growth of the economy and the necessary maintenance of other socio-economic amenities. The high rate of economic development, particularly in the recent decades, drew heavily on the resource base, both renewable and non-renewable, ranging from forestry, land, fossil fuels, and minerals to the most basic resource, water. In the past, a priority task in the efforts of the Government to achieve a balance between development and the environment was to deal with environmental problems through restorative measures backed by the enforcement of the relevant environment-related legislation, while developing strategies to forestall future problems. Through these largely curative measures, improvements of the environment were made, particularly in the agro-based processing industries. Improvements in the other sectors would be realized through restorative and preventive measures.

The Government will continue to bring about a more balanced exploitation of these resources. It will also emphasize conservation to ensure that the resulting environmental damage will not negate the benefits gained through development so that the present and future generations will continue to have access to similar resources. During the Fifth Plan period, environmental programmes will be developed to meet these objectives in most sectors of the economy. Priority will be accorded to conservation strategies and efforts that strengthen the existing regulatory machinery, particularly at the state and local government levels through the development of uniform rules with variable standards as well as through joint and well co-ordinated enforcement. At the federal and state levels, greater co-ordination between policy-formulating and programme-implementating agencies will be important. Efforts will also be directed at promoting greater involvement of the public, the citizen groups, and the private sector in environmental awareness campaign, education, and training.

II. PROGRESS, 1981-85

Environmental management

Environmental impact assessment (EIA) process. Environmental impact assessments provided the basis for evaluating the overall impact of projects on the environment. Through administrative and other arrangements, a number of projects, as shown in Table 9-1, were subjected to an informal procedure administered by the Department of Environment. By these arrangements, the environmental dimension was incorporated to some extent in the planning of development projects.

TABLE 9-1

MALAYSIA: PROJECTS SUBJECT TO INFORMAL ENVIRONMENTAL IMPACT ASSESSMENT PROCEDURE AND GUIDELINES, 1981-85

Project	*Number*
Water resources management	3
Regional development	5
Urban structural development	4
Industrial estates	1
Master plan	1
Water	
Hydroelectric power generation	7
Flood mitigation[1]	–
Irrigation storage dam	1
Petroleum and gas	
Oil refinery	2
Power plant	2
Fertilizer plant	1
Gas processing plant	2
LNG plant[1]	–
Methanol plant	1
Gas pipeline	1
Other minerals	
Iron and steel plant	1
Integrated aluminium smelter	1
Tin mining	1
Forest Industry	
Pulp and paper	3
Other infrastructure	
Oil terminal[1]	–
Tourist complex	1
Coastal land reclamation	1
Total	*39*

Source: Department of Environment.

Note:

[1] Environmental impact assessment was carried out during the Third Malaysia Plan period.

Environmental awareness. Both formal and informal education, technical training, mass media, non-governmental organizations, and citizen groups increasingly played a role in the process of creating greater environmental awareness. Some progress was made in terms of greater access to information on environmental problems and prospects, administrative and legislative means of organizing and implementing action, methodological guidance in assessment and analysis of environmental changes and measures, and training and technical co-operation in environmental matters. Regional co-operation to deal with common environmental problems, either through the Association of Southeast Asian Nations (ASEAN) or under the auspices of various United Nations agencies and programmes, had increased. Environmental aspects were also seen in clearer perspective in the various sectors of development, particularly in food and agriculture, health, industry, and human settlements.

Public involvement in environmental debate and action also increased. Support for action at both the scientific and grass roots levels to arrest environmental degradation grew in the face of some apparent negative ramifications of industrialization, urbanization, and population growth, causing significant changes in the landscape, particularly in forests, plantations, and *padi* and rural land.

On balance, the state of the physical environment in the country generally improved, although environmental problems continued to arise in certain areas. This improvement was brought about largely by the strict pollution control measures instituted in the agro-based processing industries, namely, crude palm oil and raw natural rubber. Industrial pollution control was the main activity in the various programmes introduced under the Environmental Quality Act, 1974.

Water pollution control

Agro-based industries. Both the palm oil and rubber processing industries continued to be regulated under the respective Environmental Quality (Prescribed Premises)(Crude Palm Oil) Regulations, 1977 and the Environmental Quality (Prescribed Premises)(Raw Natural Rubber) Regulations, 1978. Through heavy investments in environmental research and development, these industries successfully developed the necessary indigenous treatment technology and improved the rate of compliance with the increasingly more stringent standards stipulated under the regulations over a period of five years. With the latest treatment technology, the palm oil processing industries reduced their pollution load, in terms of Biochemical Oxygen Demand (BOD), from 1,893 tonnes to 4 tonnes per day in 1985 which is equivalent to the waste generated by 100,000 people. The level of performance, as shown in Table 9-2, was maintained over 94 per cent during the Fourth Malaysia Plan period, despite the rapid increase in crude palm oil production, and thus, in pollution generated prior to treatment.

TABLE 9-2

MALAYSIA: POLLUTION CONTROL PERFORMANCE OF PALM OIL INDUSTRY, 1981-85

Year	*Generated pollution load (tonnes/day)*	*Pollution load after treatment (tonnes/day)*	*Population equivalent of treated effluent (million)*	*Performance (per cent)*
1981	1000	58	1.2	94.2
1982	1100	35	0.7	96.8
1983	1200	19	0.4	98.4
1984	1640	4	0.1	99.7
1985	1893	4	0.1	99.8

Source: Department of Environment.

The rate of compliance to the prescribed standards was more rapid in the rubber processing industry than in the palm oil processing industry. This was explained by the characteristics of rubber wastes that were more amenable to biological treatment compared with palm oil wastes and the support of research and development (R & D) provided by the Rubber Research Institute of Malaysia (RRIM). Residual pollution from this industry, however, remained higher than that of palm oil industry due to the uncontrolled discharges from numerous smallholdings throughout the country. The pollution load could only be reduced to an equivalent of that generated by 200,000 people.

In both palm oil and rubber processing industries, the concurrent R & D efforts by the private sector played a significant part in evolving the indigenous development of treatment technology for palm oil wastes and rubber effluents. The types of R & D advanced rapidly from the conventional land applications in crop irrigation and fertilization, anaerobic-aerobic treatment, and anaerobic digestion for biogas generation to the most integrated in single-cell protein development in the recovery of palm oil waste. During the period 1979-83, the industries expended about $200 million in R & D on the treatment of polluting effluent and the recovery of other waste matters as energy in the form of biogas and electricity as well as animal feed. Greater financial input was also committed to develop more advanced and clean technologies. In addition, over $2 million was spent during the period 1980-83 by RRIM and about $1.2 million by the Palm Oil Research Institute of Malaysia (PORIM).

Manufacturing industries. With regard to other industries, particularly the manufacturing industries, the introduction of the Environmental Quality (Sewage and Industrial Effluents) Regulations, 1979, came into force in 1981. The regulations helped to reduce the organic BOD load from these industries by 60 per cent from 124 tonnes per day in 1981 to 50 tonnes per day in 1985 which is equivalent to the waste generated by 1.25 million people. The required pollution

control measures were implemented by the factories with the introduction of a licensing system based on the polluters-pay principle. The regulations were also effective in controlling new sources of pollution.

Sewerage. In 1985, the total BOD load generated from human wastes in terms of sewage and sullage discharge was 750 tonnes per day, more than that generated by the industries. The control of human wastes depended upon the progress in the provision of waterborne sewerage systems. By 1985, comprehensive central waterborne sewerage systems were available in Georgetown, Kota Kinabalu, Kuala Lumpur, and Shah Alam. Over two-thirds of the rural population were provided with sanitary latrines by 1985.

Animal husbandry. Animal wastes were largely discharged into watercourses untreated. Recognizing the lack of appropriate technology in the handling, treatment, and disposal or recovery of such wastes, the Department of Veterinary Services, in collaboration with other Government agencies and international funding agencies as well as through bilateral arrangements, initiated a number of projects to address these problems.

The Department of Veterinary Services took the necessary steps to introduce a uniform federal law in an effort to harmonize the various state enactments for the control of animal farming. By 1984, four states, namely, Johor, Melaka, Negeri Sembilan, and Terengganu had introduced their respective enactments.

Mining. The level of control of discharge from tin mines in the past was not adequate in bringing about the expected improvement in the overall conditions of most rivers and other watercourses affected by tin mines. The Department of Mines took further steps to control the discharge and runoffs from tin-mining areas, largely through the enforcement of the various state mining enactments and rules. The Department also regulated the siting of settling ponds, point of discharge, methods of treatment, and the channelling of mining effluent through a series of settling ponds prior to discharge. Water conservation was also promoted in the industry. The Department of Mines also reviewed the imposition of certain standards of discharge for suspended solids content in the effluent. The previous standards of 500 grains per gallon[1] of discharge was revised to 200 grains per gallon for new leases and 400 grains per gallon for existing mines.

Land use

Soil conservation. The control of runoffs from newly developed land for agriculture, housing, industry, roads, highways, and other infrastructural development was undertaken more on an ad hoc basis. The impact of these developments led to a higher level of pollution of the rivers in Peninsular Malaysia

[1] 1 grain per gallon = 17.1 milligrammes per litre.

as well as in Sabah and Sarawak over the years. Table 9-3 shows that the rivers in the country were polluted more by the presence of silt or suspended solids than by any other pollutants. Sungai Perlis was found to be the most polluted in terms of silt, while most rivers in Selangor carried the highest BOD load.

Ground water protection. The disposal of toxic and hazardous waste onto land, that eventually affect the quality of groundwater resources, had yet to be properly regulated and controlled. A number of joint studies were carried out to help formulate policy guidelines on the appropriate waste management strategy, including the collection, treatment, and disposal of various types of industrial wastes. A national committee was formed to draft legislation and regulations governing the development and operation of sites, and as an interim measure, the committee developed guidelines for the handling, storage, transportation, and disposal of such industrial wastes. Meanwhile, efforts to register all generators of the scheduled industrial wastes were undertaken.

Solid waste disposal. An increasing number of local authorities, particularly the large authorities, adopted sound practice in solid waste management, as shown in Table 9-4. About 85 per cent of the waste collected were disposed off by the standard method of controlled tipping. There was also a significant increase in the percentage of wastes being disposed off by incineration rather than by open burning. Furthermore, large local authorities, such as the City Hall of Kuala Lumpur and the municipalities of Ipoh, Petaling Jaya, Pulau Pinang, and Seberang Prai, considered the feasibility of privatizing solid waste disposal within their respective areas of jurisdiction.

Toxic and hazardous waste management. The local authorities, particularly those having jurisdiction over industrial areas, began to focus their attention on the need to deal with the safe handling, transportation, and disposal of wastes generated by the manufacturing and engineering industries. These industries had to dispose of the accumulating toxic and hazardous wastes captured in settling tanks in the treatment of highly polluting effluent.

In terms of volume, more than 52 per cent of the toxic and hazardous wastes were generated by the electronics industry, 14 per cent by the metal and electroplating industries, and the remainder by the chemical, rubber and plastics, printing and packaging, tannery, and pharmaceutical industries. The nature of the wastes generated varied widely. More than 52 per cent of the wastes in volume were in the form of galvanized metals. In terms of weight, over 74 per cent of the wastes were settled sludge generated by the metal and electroplating industries and 12 per cent were solid pieces of highly contaminated waste generated by the electronics industry.

TABLE 9-3

MALAYSIA: THE EXTENT OF RIVERS AFFECTED LARGELY BY SOIL EROSION AND SILTATION BY STATE, 1978-83
(%)

State	Clean place			Time		
	The extent of rivers that continued to remain clean at any time in the past			The maximum percentage of the time that pollution continued to occur at any point along any river		
	SS	$NH\text{-}N_3$	BOD	SS	$NH\text{-}N_3$	BOD
Johor	12	80	82	95	75	95
Kedah	3	82	57	95	95	95
Kelantan	13	100	96	95	5	25
Melaka	38	68	88	65	65	65
Negeri Sembilan	10	18	72	95	95	75
Pahang	22	87	90	95	65	65
Perak	3	75	76	95	75	75
Perlis	0	87	67	95	15	25
Pulau Pinang	18	68	60	95	95	95
Sabah	22	100	74	95	5	35
Sarawak	41	100	96	95	5	55
Selangor	18	53	50	95	95	95
Terengganu	33	92	83	95	65	95

Source: Department of Environment.

Key : SS Suspended solids, indicator of river siltation.
$NH\text{-}N_3$ Ammoniacal Nitrogen, indicator of organic pollution.
BOD Biochemical Oxygen Demand, indicator of organic pollution.

TABLE 9-4

PENINSULAR MALAYSIA: MUNICIPAL PRACTICES IN WASTE DISPOSAL, 1977 AND 1984
(%)

Practice	*Municipalities*		*Waste in unit quantity*	
	1977	*1984*	*1977*	*1984*
Sound practice				
Controlled tipping	16.9	19.4	44.5	84.6
Incineration	2.6	4.2	0.6	0.1
Unacceptable practice				
Haphazard dumping	24.8	25.7	30.6	4.5
River or coastal dumping	0.7	2.7	0.2	0.8
Open burning	55.0	48.0	24.1	10.0
Total	100.0	100.0	100.0	100.0

Source: Department of Environment.

Control of pesticides. The use and abuse of pesticides were largely regulated under the Pesticides Act, 1974, administered by the Ministry of Agriculture. The Act empowered the Pesticides Board, an interagency regulatory body, to declare a pesticide as legal or illegal. In January 1985, a regulation was issued for purposes of labelling, registration, importing for educational and research purposes, advertising, and manufacture of pesticides.

Marine environmental protection

Control of land-based sources. The control of wastes discharged into the surrounding seas through rivers and other land-based sources was also beneficial to the marine environment. Most pollutants, including oil from land-based sources, were largely controlled by the enforcement of various regulations under the Environmental Quality Act, 1974.

Control of vessel sources. Several measures were initiated and implemented for the prevention and control of marine pollution from vessel sources. Among the significant measures were the regular exercises conducted by the Department of Environment and other Government agencies under the National Contingency Plan for the Mitigation and Control of Oil Spills in the Straits of Malacca, and the implementation of the Traffic Separation Scheme in the Straits of Malacca and Singapore since May, 1981, in order to prevent collisions and grounding of tankers.

The control of deliberate discharges from ships was effective, particularly within port limits. Deliberate discharge accounted for 62 per cent of the 46 cases of oil spills in Malaysian waters as of October 1984. Prosecution action was taken against five vessels for deliberate discharge of oil. Beyond the port limits, the necessary administrative machinery came into operation with the establishment of the Maritime Enforcement and Co-ordination Centre under the auspices of the Office of the Secretary to the National Security Council to help control similar discharges, particularly in the Exclusive Economic Zone (EEZ). The Centre, operating from the Lumut Naval Base, also co-ordinated the enforcement and surveillance activities of all marine-related agencies at sea.

Air conservation

Control of industrial emissions. The problems of air pollution were controlled largely through the enforcement of the Environmental Quality (Clean Air) Regulations, 1978 and the Motor Vehicle (Control of Smoke and Gas Emission) Rules, 1977. Most factories installed air pollution control devices to reduce emissions of dust, black smoke, and toxic gases. Enforcement inspections were

stepped up to ensure that control devices were effectively operated at all times. By October 1984, 31 factories were charged in court for various offences under the Clean Air Regulations. In addition, about 400 cases were compounded and a further 288 cases were issued warnings in writing with directives to upgrade pollution control equipment.

Control of motor vehicle emissions. The Department of Environment, together with the Police, conducted regular enforcement campaigns in major towns in Peninsular Malaysia for the purpose of controlling motor vehicle emissions. By July 1984, 2,500 car owners or drivers were served with summons for emitting dark smoke under the Motor Vehicles (Control of Smoke and Gas Emission) Rules, 1977.

Noise control. With regard to control of noise pollution, a National Noise Control Committee was established to study and monitor all aspects of the problem. Appropriate regulations for noise control were formulated. Noise monitoring was also conducted in various towns to determine typical noise levels experienced by the public due to industrial operations, construction activities, motor traffic, and aircraft landings. At the same time, noise control measures were imposed on new industries at the time when site approvals were considered.

Nature conservation

Terrestrial parks and reserves. The preservation of representative areas of natural forest and marine ecosystems with its constituent flora and fauna continued to be accorded due importance. The natural forest habitats play a significant role in the preservation of watersheds and in the maintenance of hydrological cycle. They also serve as a permanent resource of scientific, cultural, and recreational values. About 776,400 hectares in Peninsular Malaysia, 103,200 hectares in Sabah, and 74,670 hectares in Sarawak were designated as national parks and wildlife reserves under the programme for conservation and preservation of flora and fauna, as shown in Table 9-5.

Marine parks and reserves. Further efforts were undertaken to conserve entire ecosystems in the coastal and marine environment, including estuaries, beaches, mangroves, and the coral and island reefs. By December 1984, the Government legislated three national parks and two state parks which included marine habitats. The three national parks were the Bako National Park in Sarawak, Pulau Gaya National Park, and the Turtle Islands in Sabah, while the two state parks were the Mukahead State Park and the Dungun Beach.

TABLE 9-5

MALAYSIA: SYSTEM OF EXISTING TERRESTRIAL PARKS AND RESERVES, 1984
(hectares)

Park/reserve	*State*	*Area*
Peninsular Malaysia		776,393
Taman Negara	Pahang, Kelantan and Terengganu	434,351
Cameron Highlands	Pahang	176,000
Endau Rompin	Pahang and Johor	87,464
Krau Game	Pahang	53,095
Tioman	Pahang	7,160
Bukit Kota Wildlife Reserve	Selangor	4,800
Sungai Dusun	Selangor	4,330
Fraser's Hill	Pahang	2,979
Templer Park	Selangor	2,450
Sungkai Game	Perak	2,428
Pahang Tua	Pahang	1,336
Sabah		103,196
Sarawak		74,670
Total		954,259

Source: Department of Wildlife and National Parks, 1984.

III. PROSPECTS, 1986-90

Strategies

Enforcement. The need to maintain a clean and healthy environment requires effective and regular enforcement of all existing environment-related laws, regulations, and rules. Every regulatory agency will have to develop a comprehensive system of monitoring and assessment of both specific and general compliance with source and ambient standards. These agencies will ensure that conditions specified in the various licences are met by various types of businesses or activities. In order to bring about an improvement in the overall conditions of the environment as well as to induce uniform applications of various laws and regulations, the relevant authorities at the federal and state levels will ensure that joint enforcement programmes be carried out by their respective regulatory agencies. In this connection, state executive committees on the environment will be set up *inter alia* to ensure that these programmes are developed and properly co-ordinated.

Environmental awareness. Active public support is required to complement the efforts of the government in keeping the environment clean and pleasant as well as promoting and preserving the unique and diverse national and natural heritage. The public will need to be made more aware of the immediate and long-term

environmental consequences of their action in carrying out their own daily activities, through the popular mass media and public campaigns.

Environmental planning in development. The basic need to provide the general population with clean air and water and a healthy environment cannot be overemphasized. It is important, therefore, to maintain the quality of the environment relative to the needs of the growing population of the country, particularly with regard to the productive capacity and sustenance of renewable resources. The impact of the growing population and human activities relating to mineral exploration, deforestation, agriculture, urbanization, tourism, and the development of other resources on the environment will be measured, where possible, and accounted for.

There has been an increased awareness among the people on the need to maintain and protect the environment. Nevertheless, the environmental standards to be adhered to will be made consistent with development goals of the country rather than the high environmental quality standards of the industrialized countries. In this respect, environmental quality standards that are established in the country will take cognizance of its level of development and provide support to its development strategies. The maintenance of sound environmental conditions will, therefore, be balanced against the goals for socio-economic development and the need to bring the benefits of development to a wide spectrum of the population.

Environmental programmes. Underlying the importance of striking a balance between development and the environment is the need to place more emphasis on prevention through conservation rather than on curative measures. Elements of this strategy will include the enforcement of laws and regulations, the conduct of regular environment impact assessment studies prior to the implementation of relevant projects, and public awareness and education through special television programmes. Further developments of ambient air, water, and land quality criteria and standards will be undertaken. Co-operation and co-ordination among the ASEAN Governments will be further strengthened since environmental matters transcend national boundaries. Greater co-operation and increased coordination among relevant federal and state authorities and agencies will be fostered through the establishment of appropriate state executive committees on environment.

Project implementation. In order to incorporate an environmental dimension in project planning and implementation, it is necessary that the implications of the proposed projects be studied and the costs of the required environmental mitigation measures determined. This will be implemented mainly through the conduct of EIA.

The state of the environment

While the general environmental conditions have improved, furthur progress in the state of the environment will be made. The amount of pollutants will be controlled in order to provide the country and its growing population with clean air as well as safe and uncontaminated water, land, and seas.

Air quality. Air quality remains relatively unpolluted except in industrial and urban areas such as Seberang Prai, Kuala Lumpur conurbation, and Johor Bahru. Suspended particulate matters and lead in the air along congested roads are generally found to be the most serious. With the increasing use of liquid petroleum gas, a substitute to petroleum or diesel and high sulphur fuel, the level of suspended particulates harmful to human health and welfare in the urban areas will be further reduced. The lead content in the urban air is also expected to be under control with the reduction of lead in motor gasoline from 0.84 grammes per litre of petrol in 1985 to 0.40 grammes per litre in 1986 and 0.15 grammes per litre in 1990. A plant to manufacture methyl teritiary buthyl ether (MTBE), the lead substitute, will be built locally and is expected to be in production by 1990.

Water quality. The majority of the rivers continue to be polluted mainly by silt and other suspended solids. The prospects for the improvement of these conditions are, however, promising. The quality of these rivers, measured in terms of suspended solid content, has been improving at the rate of 8.5 per cent per year. With regard to the problems caused by the discharge of untreated or partially treated animal, human, and other organic wastes, the affected rivers are expected to improve at the rate of 5.5 per cent per year, measured in terms of BOD load. Pollution control of the coastal waters and the marine environment will continue to be given emphasis. With the implementation of measures to improve environmental quality, the coastal waters are expected to continue to improve.

Land use. More than 35 per cent of the land in Peninsular Malaysia have been developed for agriculture, mining, urbanization, and infrastructure. About 20 million hectares or 62 per cent of the land area in Peninsular Malaysia is still under natural forest cover, of which 10 per cent can be considered to be rich and diverse ecosystems of scientific significance. The prospects for more areas to be set aside for multipurpose parks and reserves are promising, in view of the close collaboration between the federal and various state agencies in identifying and managing these areas.

IV. CONCLUSION

Overall improvements in the environment have been constrained due to difficulties faced by certain sectors of the economy in bringing about drastic cuts in their respective pollution loads. Soil erosion and siltation have now become the main water pollution problem. In terms of air pollution, emissions from motor

vehicles are more serious, particularly in congested areas, than those from industrial sources. The coastal zones are threatened by the discharge of partially treated or untreated sewage, sullage waters, and animal wastes as well as oil from vessels and other marine sources. In this regard, greater control will be exercised over pollution from non-point sources, particularly from the widespread discharge of untreated sewage, market places, erodable lands, animal farms, and other agriculture and forest lands that have been subjected to the excessive use and abuse of pesticides. At the same time, the environmental strategy will focus more on prevention rather than protection. Environmental dimension will be incorporated in development planning, project implementation, and operations and maintenance. Achieving a proper balance between development and the environment will rest on the extent of environmental consciousness and positive action displayed by all.