Chapter XV

Environment

CHAPTER XV

Environment

I. INTRODUCTION

15.01 As efficient management of the environment and natural resources is an essential condition for ensuring balanced development, the Government, during the Sixth Malaysia Plan period will develop better techniques for integrating environmental considerations in the formulation of programmes and projects. Effective implementation of environmental programmes will ensure that the poor are not adversely affected by environmental degradation since they are the most vulnerable and least capable of protecting themselves. In addition, to sustain the development of scarce and depletable natural resources, the Government will progressively control pollution and enhance the natural beauty of national landscapes and physical surroundings through the conservation of natural resources and the preservation of the environment.

15.02 At the international level, Malaysia continues to play a visible role. The Langkawi Declaration on the Environment, which Malaysia initiated at the Commonwealth Heads of Government Meeting (CHOGM) in October 1989, epitomized our continued commitment to the global plan of action aimed at arresting possible environmental degradation and promoting environmentally-sound and sustainable development.

II. PROGRESS, 1986-90

State of the Environment

15.03 *Air Quality.* During the period 1986-90, air quality in terms of total suspended particulates (TSP) monitored in the commercial and industrial areas had improved while the levels of particulates increased slightly in the residential and vehicular traffic areas. However, air quality

as measured by TSP was within the recommended Malaysian Annual Guideline of 90 microgram per cubic metre (ug/m^3). While air quality generally improved, TSP values in the industrial and heavy traffic areas in the Klang Valley, Johor Bahru and Pulau Pinang were slightly above the recommended level.

15.04 The concentration of atmospheric lead, another indicator of air quality, declined in all areas. These improvements, particularly in the heavy traffic areas and residential areas, were attributable to the mandatory reduction of lead content in gasoline from 0.4 gram per litre (g/litre) to 0.15 g/litre.

15.05 Studies on the concentration of gaseous pollutants in the ambient air in the Klang Valley indicated that levels of sulphur dioxide and nitrogen dioxide were well within the recommended Malaysian one-hour guidelines of 350 ug/m^3 and 320 ug/m^3, respectively. Ozone levels in Kuala Lumpur city centre occasionally exceeded the Malaysian one-hour guideline value of 200 ug/m^3, while carbon monoxide levels were fairly high, exceeding the 35 ug/m^3 guideline. These findings also indicated that the sulphur dioxide, nitrogen dioxide and carbon monoxide levels were within satisfactory limits in the residential areas.

15.06 *Water Quality.* During the Fifth Plan period, the quality of river water, in terms of biological oxygen demand (BOD), suspended solids, and ammoniacal-nitrogen, deteriorated. The quality of water is considered 'clean' for biological support of life if the BOD measure is 3 milligram per litre (mg/litre), total suspended solids content of not more than 50 mg/litre and if its ammoniacal-nitrogen content does not exceed 0.3 mg/litre. In terms of BOD, organic pollution deteriorated at the rate of 0.37 per cent while the levels of ammoniacal-nitrogen and suspended solids deteriorated at 10.17 per cent and 1.89 per cent, respectively. These indicated the prevalence of heavy and uncontrolled loadings of organic wastes and silt in the water courses. Industrial and domestic discharges accounted for major components of the organic load while land clearing, unregulated development, mining and logging activities in the catchment areas were responsible for sedimentation and siltation problems. Untreated domestic sewage and animal wastes continued to pose a major problem as indicated by the deterioration rate of 10.17 per cent for ammoniacal-nitrogen.

15.07 Rivers on the west coast of Peninsular Malaysia were more polluted with heavy metals such as mercury than other rivers in the country. This was due to extensive land use and industrialization

resulting in increased wastewater discharges containing heavy metals. Small and service type industries established without proper and adequate wastewater treatment facilities were the principal source of pollution.

15.08 *Coastal and Marine Water Quality.* The coastal and marine waters remained contaminated with traces of oil and grease, total suspended solids and faecal coliform. However, the degree of contamination remained at about the same level compared with the previous Plan period, although water quality had deteriorated slightly in certain locations. Some parts of the coastal areas of the States of Kelantan, Melaka, Negeri Sembilan, Sabah, Selangor and Terengganu were found to have traces of oil and grease. The situation in Sabah and Selangor had, however, improved.

15.09 Sewage contamination mainly from both domestic and animal wastes, as indicated by faecal coliform, were found in Pahang, Perak, Pulau Pinang and Sarawak. A number of river estuaries in the States of Johor, Kedah, Kelantan, Perak, Pulau Pinang, Selangor and Terengganu were also contaminated. This was due to high population density, unorganized disposal of human wastes in squatter areas, increased urbanization, the prevalence of dense settlements along the coast and the lack of adequate facilities for sewage treatment. Except for a few isolated locations, the coastal waters of recreational beaches were not contaminated and were safe for recreational and water sport activities. Nevertheless, the degree of contamination by suspended solids continued to prevail as a result of continued extensive land development activities carried out in the upland and adjacent areas.

Management of Toxic and Hazardous Wastes

15.10 Periodic surveys to monitor the generation and management of toxic and hazardous wastes were carried out. A study on the treatment and disposal of hazardous wastes indicated that not less than 380,000 m^3 of toxic and hazardous wastes were being generated annually from some 1,000 sources.

15.11 Since May 1989, two new sets of regulations and an order for the management of 'scheduled wastes' (toxic and hazardous wastes) were enforced. The Environmental Quality (Scheduled Wastes) Regulations, 1989, prescribe a list of waste substances described as 'scheduled wastes'. The Environmental Quality (Prescribed Premises) (Scheduled Wastes Treatment and Disposal Facilities) Order, 1989, has identified six types of facilities which require licensing. These are off-site storage, treatment

facilities, off-site recovery facilities, scheduled waste incinerators, land treatment facilities and secured landfills. In addition, the Environmental Quality (Prescribed Premises) (Scheduled Wastes Treatment and Disposal Facilities) Regulations, 1989, has specified the operation and licensing procedures for facilities constructed for the recovery, treatment, storage and disposal of scheduled wastes.

15.12 The regulations for the management of toxic and hazardous wastes are comprehensive, covering all stages of waste handling. A computerized system for the tracking and monitoring of hazardous wastes was developed. Regulations were introduced requiring that the appropriate authorities be informed of activities involving the generation, storage and transportation of toxic and hazardous wastes. Presently, factories store their wastes on-site while awaiting the availability of treatment and disposal facilities. In recognition of this problem, the Government provides tax and other incentives to encourage companies to build facilities for the storage, treatment and disposal of such wastes.

Control of Pollution

15.13 *Water Pollution.* Industrial sources of water pollution continued to be concentrated on the west coast of Peninsular Malaysia, with Johor, Pulau Pinang and Selangor accounting for almost 50 per cent. The principal industries responsible for such pollution were industries manufacturing textiles, rubber, paper, and food and beverages.

15.14 Pollution from non-industrial wastes, the most significant contributor of organic pollution in inland waters, showed little improvement during the Fifth Plan period. Sewage and wastes from animal husbandry increased over the period: with the former from 6.28 million population equivalent to 7.56 million population equivalent, and the latter from 1.1 million population equivalent to 1.3 million population equivalent. Sewage remains the main contributor to organic pollution accounting for three times the combined load discharged from industries and animal husbandry.

15.15 Pollution load discharges from palm oil and rubber processing were within control despite increases in the number of such factories. The organic load discharged by the two industries in 1990 were equivalent to the waste generated by a population of only 260,000 compared with 420,000 in 1989 and 600,000 in 1986. The enforcement of the relevant regulations with respect to effluents discharged by these industries indicated that treated effluents complied with specified standards.

15.16 Progress was made in the control of pollution from other industries. Nevertheless, factories established prior to the enforcement of the Environmental Quality (Sewage and Industrial Effluents) Regulations, 1979, experienced difficulties in complying with the requirements due to constraints such as land. However, those established after the enforcement of these Regulations were able to meet the requirement.

15.17 The problem of pollution from animal husbandry has not been resolved. Some states have yet to legislate the required enactments to control and enforce hygienic control of animal wastes while others have not effectively enforced the enacted laws. The 'Pig Farming Area' (PFA) concept contained in the National Agriculture Policy has not been fully implemented. Controlled and organized pig farming is necessary since the industry has become a significant environmental problem, especially in Negeri Sembilan and Pulau Pinang. In Negeri Sembilan, it has affected water sources from Sungai Linggi which require expensive biological and chemical treatment before the water can be used for domestic purposes. Animal waste pollution from the river has also affected coastal waters and beaches, thereby affecting the attraction of Port Dickson as a popular tourist destination. The beaches in some locations in Pulau Pinang have deteriorated, affecting the hygienic quality of aquaculture products. Despite a number of research projects, for example, by the Malaysian Agricultural Research Development Institute (MARDI), no practical and viable system for treating animal wastes has been found. This is because most of the pig farms are managed as cottage industries.

15.18 Pollution load from sewage continued to increase due to greater urbanization and inadequate sewerage facilities as only 5 per cent of the urban population benefited from centralized sewerage facilities. Improvements to sewerage facilities in existing towns were constrained by the high costs of implementing centralized systems and limited financial resources of local authorities. However, in the new built-up areas, the local authorities have enacted regulations requiring developers to provide adequate sewerage and sanitation facilities in these areas.

15.19 *Air Pollution.* Air pollution was estimated to have increased by 6 per cent during the Fifth Plan period. The largest contributor to air pollution was motor vehicles which registered rapid increase during the period. The Motor Vehicle (Control of Smoke and Gas Emission) Rules, 1977, regulates the emission of black smoke from diesel-powered motor vehicles.

15.20 Until June 1990, about 180,000 vehicles had been tested for smoke emissions using the Hartridge Smokemeter and 29,325 drivers or owners had been served with summons for exceeding the specified limit of 50 Hartridge Smoke Units (HSU). The overall percentage of compliance remained constant at 83 per cent. Effective from 1st January 1990, the concentration of lead (Pb) in petrol was further reduced to 0.15 g/litre as required by the Environmental Quality (Control of Lead Concentration in Motor Gasoline) Regulations, 1985. Random samples taken from petrol manufacturers and suppliers particularly petrol kiosks in urban areas have shown compliance with the new standard.

15.21 Industrial sources of air pollution are controlled by the Environmental Quality (Clean Air) Regulations, 1978. In accordance with the Regulations, new factories emitting air impurities into the atmosphere have to be evaluated to ensure compatibility with land usage in surrounding areas. In addition, the installation of air pollution control devices are required to ensure compliance with standards of emission for air impurities.

15.22 The open burning of industrial wastes, particularly in wood-based and rubber-based factories, remains a major problem. Up to July 1990, about 1,370 cases of open burning have been compounded. The open burning of wastes at local authority dumping grounds was also found to be a problem.

15.23 *Marine Pollution.* To further control waste discharges from land-based sources to the marine environment, the amendment to the Environment Quality Act, 1974, that came into effect on 9th January 1986, prohibits the discharge and spillage of oil and wastes into Malaysian waters, unless licensed. As for the control of pollution from sea-based sources, the Merchant Shipping Ordinance (MSO), 1952, controls the discharge of oil and harmful substances from ships.

15.24 *Pollution from oil spills.* During the Fifth Malaysia Plan period, more sightings of oil spills were reported from oil platforms. With the cooperation of the Marine Department and various port authorities, most of the spills occuring in port areas were cleaned up and the costs of cleaning were recovered from the spillers.

15.25 *Noise pollution.* Control of noise pollution from motor vehicles was carried out under the Environmental Quality (Motor Vehicles Noise) Regulations, 1987. However, enforcement initially was focussed on noise

pollution from motorcycles. Plans and strategies for the management and control of noise and vibration problems in dense settlements are being formulated, incuding the feasibility of constructing noise barriers along major highways.

Pollution from Agricultural Chemicals

15.26 No specific programmes have been implemented to control pollution arising from the use of chemical fertilizers, pesticides and herbicides in agriculture. The indiscriminate use of such chemicals in certain locations resulted in the substantial reduction of freshwater fish. Studies have not been carried out to determine the effects of pollution from these chemicals.

Response Planning for Oil Spills

15.27 During the Fifth Plan period, the National Oil Spills Contingency Plan was formulated, incorporating the Plans for the Straits of Melaka and the South China Sea. The concept of cooperative support and joint response action was built into the Contingency Plan. Unlike the Straits of Melaka Contingency Plan, which was developed during the Third and Fourth Malaysia Plans, the National Contingency Plan placed greater emphasis on the pooling of resources and maximizing the utilization of available resources. Under this Plan, oil industries and port authorities were required to upgrade their response capabilities. The Department of Environment (DOE) is modernizing its equipment by replacing the old oil booms and skimmers. At the regional level, Malaysia, Indonesia and Singapore developed a cooperative plan to combat oil spills in the Straits of Melaka and Singapore waters. A similar cooperative plan has also been initiated between Malaysia and Brunei Darussalam to cover the seas bordering these two countries. An Association of South-East Asian Nations (ASEAN) Plan for mitigating oil spills is being developed with assistance from international agencies.

15.28 Since communications play an important role in contingency planning, a Communications Centre was set up at the DOE to complement operational capabilities of other operation centres at *Petroleum Nasional Berhad* (PETRONAS), the Marine Department and the Maritime Enforcement Coordination Centre in dealing with oil spills. Guidelines on the use of dispersants for combating oil spills were formulated by the National Oil Spills Contingency Plan Committee.

Conservation of Natural Resources

15.29 Malaysia is endowed with rich and varied natural resources particularly forests, rivers, coastlines and fertile soil. Despite developments encroaching upon virgin forest areas, 12.73 million hectares, or 38.6 per cent, remain as permanent forests. Of this, 29 per cent is protected or maintained as amenity forests. In addition to the area under permanent forest, 1.39 million hectares are being maintained as national parks and wildlife reserves, and 4.61 million hectares as state land forests. During the Fifth Plan period, some 1.56 million hectares of permanent forests were rehabilitated while some 80,000 hectares of logged-over areas in Peninsular Malaysia are being rehabilitated.

15.30 During the Fifth Plan period, the Government continued to monitor developments encroaching upon these natural reserves. Excessive forest harvestings and extensive land-based development could lead to deforestation, massive erosion, diminution of catchment areas with consequential effects on weather, atmospheric temperature, water sources and soil quality as well as coastal pollution. Lowland forests, mangrove and peat swamp areas were also closely monitored in order to prevent further destruction of spawning grounds for fish and other marine life. Since the marine ecosystem is vital in sustaining bio-organisms on which fishes thrive, large-scale mangrove and peat swamp clearings, aquaculture and cage culture activities were closely monitored.

Environmental Awareness

15.31 Environmental education, as a tool for creating environmental awareness, was introduced in the upper primary school curriculum in 1986 in the form of the subject 'Man And His Environment'. This subject is intended to provide knowledge, perception and positive attitudes towards the environment in a holistic manner. At the tertiary level, both *Universiti Pertanian Malaysia* (UPM) and *Universiti Teknologi Malaysia* (UTM) offered formal degree courses which covered environmental topics such as pollution control, environmental management and environmental control technology. Environmental education and awareness programmes on a non-formal basis were conducted by various Government agencies, voluntary organizations and by the private sector.

III. PROSPECTS, 1991-95

15.32 In line with the spirit of the Langkawi Declaration on the Environment, the implementation of sectoral programmes and projects will continue to focus on the necessity of maintaining a balance between the competing demands of growth and sustainable development.

15.33 In the light of rapid industrialization, high population growth, increasing urbanization, growing scarcity of land and other resources, greater emphasis will be given to sustainable development. The increased tempo of development calls for greater efforts at maintaining environmental cleanliness and ecological balance through more effective environmental management.

Environmental Issues and Concerns

15.34 During the Sixth Plan period, the major environmental issues and concerns which require effective management are as follows:

- the increasing air and noise pollution in the urban areas as a result of the expansion of automobile ownership and vehicular traffic, with increasing affluence of Malaysians;
- constraints on the supply of affordable housing and efficient sewerage and sanitation facilities in major towns;
- the lack of adequate and efficient on-site or off-site waste disposal facilities;
- pollution caused by unorganized disposal of consumer products;
- the encroachment of economic activities on vegetation, forest cover and catchment areas which have serious repercussions on sustained water supply; and
- soil-related pollution caused by unplanned construction activities.

Effective management of these concerns will continue to pose new challenges to the nation during the coming decades.

15.35 The conservation of the environment is the responsibility of all, namely, the Government, industries and the public. Reliance on the Government and its machinery alone is insufficient to guarantee environmentally-sound and sustainable development. Public sector agencies will be required to give equal priority to environmental consideration in formulating and implementing programmes and projects. Strict enforcement of existing laws will be made to require industrial establishments to control the production of pollutants and adoption of a more effective storage and disposal system.

15.36 Although within the Government, DOE is charged with the responsibility to monitor the state of the environment, all public agencies are equally responsible for environmental preservation and resource sustainability. While DOE will play the lead role in enforcement programmes, other public agencies will complement its role through

incorporating environmental concerns in the formulation of programmes and projects. This coordinated effort will enhance the effectiveness of environmental management.

15.37 State governments will have to give higher priority to efforts directed at sustainable development of natural resources which are depletable and non-renewable. In addition, the states need to manage developments which have serious repercussions on the environment and the welfare of society. Therefore, measures should be undertaken to prevent overlogging, safeguard catchment areas and control industrial pollution.

15.38 The private sector has an important role to play in safeguarding the environment since many of its activities result in pollution. In the pursuit of profits, the negative externalities or costs to society must be taken into account by internalizing as much as possible the pollution costs. The Government will consider the feasibility of imposing pollution charges and surcharges on the private sector to ensure compliance.

15.39 Environmental awareness programmes will be intensified to promote greater consciousness among the public since the lack of environmental awareness may be due to ignorance of the long-term adverse implications of pollution hazards to human welfare.

15.40 In view of the current inadequate disposal and treatment facilities and the higher tempo of industrialization, future approvals of investment proposals will give due consideration to the technology to be used to ensure that the negative impact on the environment is minimized. In order to facilitate this effort, state governments and local authorities will expedite the identification of suitable disposal areas.

15.41 With the level of atmospheric and air pollution on the increase in major urban areas, measures will be undertaken to limit traffic flows in congested towns like Kuala Lumpur, Georgetown and Johor Bahru. Public transport facilities will be improved to reduce traffic congestion.

Conservation and Sustainable Resource Development

15.42 *Sustainable Forestry Resources.* Forest resources will be carefully exploited to ensure sustainable growth and safeguard the welfare of future generations. Since indiscriminate and unorganized exploitation of resources accelerates the depletion rate and undermines the development of vital sectors, the Government is formulating a National Conservation Strategy to provide the framework for comprehensive resource management and utilization.

15.43 Of the 12.73 million hectares of permanent forests, 2.74 million hectares are protected forests and 9 million hectares are production forests. About 4.74 million hectares of permanent forests are located in the Peninsular, 3.35 million hectares in Sabah and 4.64 million hectares in Sarawak. In addition, about 6.09 million hectares are logged-over areas of which 2.40 million hectares are in Peninsular Malaysia, 2.25 million hectares are in Sabah and 1.44 million hectares are in Sarawak. These logged-over areas which represent 17.5 per cent of the national land area need to be progressively reforested.

15.44 In the Sixth Plan period, programmes will be implemented to support the sustainable development of forest resources. *Firstly*, additional forested areas will be designated as forest reserves, animal sanctuaries and national recreational parks to ensure that the ecological balance is maintained, environmental occurrences of degradation minimized and essential habitats and biodiversity preserved.

15.45 In support of this strategy to conserve the natural heritage, nine states have taken the initiative, with the assistance of the World Wildlife Fund for Nature, to formulate conservation strategies. These States are Kedah, Kelantan, Melaka, Negeri Sembilan, Perlis, Sarawak, Selangor, Terengganu and Wilayah Persekutuan Kuala Lumpur.

15.46 *Secondly*, large-scale reafforestation supported by agro-forestry programmes will be carried out. Greater priority will be given to provide funds for research and development (R&D) on reforestation, ensure strict enforcement and conduct studies to determine fees for licences for logging to preserve environmental quality.

15.47 *Thirdly*, tree cover will be expanded to preserve the habitats, safeguard soil quality, reduce siltation and erosion, sustain climatic balance and also absorb excessive carbon dioxide released into the atmosphere. This programme is anticipated to reduce soil losses, droughts, floods, disruption of water supplies and to replenish the natural productivity of land.

15.48 *Fourthly*, the conservation of marine resources is an important development programme during the Sixth Plan period. In addition to sustaining fishery resources, the marine ecosystem will be further protected to preserve natural heritage, promote tourism and encourage marine research.

15.49 The maritime waters around 22 islands have been gazetted as Fishery Protected Areas. This programme, which began in 1985, presently covers six visitor parks in Mersing, Pulau Besar, Pulau Payor, Pulau Redang, Pulau Tinggi and Pulau Tioman. These areas will also be zoned for scientific research, restoration, recreation and educational purposes. The Fisheries Department, in particular, is entrusted with the responsibility towards proper management of these areas.

15.50 Corals are essential for the maintenance of the delicate ecosystem that shelter marine organisms and marine life. Inshore water and beach contamination from untreated animal wastes and human discharges into coastal waters have affected living coral reefs. In addition, ground water and streams carrying untreated sewage and agricultural chemicals have led to the growth of algae which kill marine organisms. Shifting cultivation, which has accentuated sedimentation of rivers and streams has spurred algae growth which destroyed the growth of corals. There is, therefore, an urgent need to sustain marine resources by controlling sewage discharges, restraining mangrove felling, judicious land clearing as well as large-scale land reclamation.

15.51 To rectify the problem created by animal waste pollution arising from pig rearing activities particularly in Negeri Sembilan and Pulau Pinang, the Government is considering suitable areas for relocation and providing the necessary facilities for filtering and treating pig wastes and charging the users of such facilities by imposing a suitable poll tax on pigs. The pig rearers have produced negative externalities to society, a cost which is not reflected by the price of their products. This burden to society in the form of pollution to the environment needs to be compensated by them.

15.52 *Fifthly,* programmes and projects which are likely to adversely affect the environment will be carefully planned and implemented. The preservation of unique flora and fauna and biodiversity which may be endangered by such projects will be given due attention.

15.53 *Marine and Coastal Resources.* Coastal and lowland forest areas and mangroves and peat swamps have been extensively felled for fuel, piling and aquaculture projects. As a result, only about 98,300 hectares of mangroves are left, of which some 81,250 hectares, or 82.6 per cent, are productive. Since coastal forests, especially mangroves, are fast disappearing and the mangrove ecosystem is essential for the maintenance of crucial fishery resources, both inshore and offshore, the Government will take the necessary preventive measures to sustain them.

In this respect, large-scale land reclamation projects which are likely to have negative effects on mangroves and the coastal ecosystem will be closely monitored.

15.54 Twelve areas of wildlife sanctuaries and reserves, involving about 548,000 hectares have been identified in Johor, Kedah, Kelantan, Pahang and Perak. Of these, Johor has gazetted the Endau-Rompin area as a state park. Besides maintaining biological diversity, these programmes will serve as additional tourist attractions. Towards implementing these programmes, the Federal Government will initiate discussions with the respective state governments to gazette these areas as wildlife sanctuaries and nature reserves.

15.55 Malaysia has abundant potential marine resources and beaches for an expanding tourism industry. However, pollution is fast threatening these resources, unless vigorous control measures are undertaken. The beaches in Negeri Sembilan especially Port Dickson are being threatened by pollution from pig rearing which pollutes the Sungai Linggi. Similarly, the lack of adequate and efficient sewerage facilities on account of the rapid growth of the hotel industry along the beaches in Pulau Pinang has resulted in problems of beach pollution in Pulau Pinang. Therefore, uncontrolled development onshore and along the coasts will not only accentuate beach pollution but will also eliminate potential for states to benefit from the expanding tourism sector. The tourism sector is a growing sector in Malaysia and thus the potentials of the beaches and coastal waters as touristic resources need to be sustained.

15.56 Towards this end, some of the major programmes to be implemented under the Sixth Plan period will be:

- promoting the development of waste disposal facilities for industries and the adoption of environmentally-sound technologies and processes;
- sustaining 12.73 million hectares of land area as permanent forests and 1.16 million hectares as national parks, nature reserves, habitats and wildlife sanctuaries;
- rehabilitation of 101,300 hectares of logged-over areas annually and sustaining 1.65 million hectares of rehabilitated areas as permanent forests as well as enforcing rules on the destruction of mangroves and control of rivers and water quality standards;
- implementing agro-forestry projects, involving some 90,000 hectares of land, and planting trees in unused agricultural lands and beautifying the natural surroundings of urban areas;

- minimizing the adverse impacts of pollution, erosion and sedimentation from development activities; and
- enforcing fully the Environmental Impact Assessment (EIA) requirement for projects which have potential of damaging the environment.

15.57 With regard to marine pollution, the control of pollution from ships will be emphasized in the amendment to be made to the MSO, 1952, which presently covers only Peninsular Malaysia. The new amendment will enable the provisions under the Ordinance to be extended to cover the whole nation. In addition, it will also facilitate the ratification of international conventions pertaining to marine pollution and intervention on the high seas.

Economic Development and the Environment

15.58 Future development efforts will emphasize the impact of development on the environment to ensure that environmental quality is sustained.

15.59 *Industrialization and Environment.* To ensure that the industrialization process will not result in the worsening of the environment, measures will be undertaken to:

- review current environmental protection measures, namely, the laws, rules and regulations, environmental standards and guidelines to improve their effectiveness;
- encourage existing industrial establishments to give priority to measures towards safer storage, treatment and disposal of toxic and hazardous wastes and effluents and to use more environmentally-sound technology and processes that will minimize pollution;
- ensure that industries complement Government efforts by meeting acceptable industry-specific effluent and emission standards, and following other desirable environmental practices;
- ensure that approval of new industrial investments gives special consideration to the most appropriate technology for production and processing as well as effective waste treatment and disposal systems;
- ensure that public sector R&D agencies devote a significant part of their research efforts towards identifying suitable and effective disposal systems and disposal locations, and the feasibility of using wastes for productive purposes; and

- provide clear codes and guidelines to industries and monitor their compliance regularly.

15.60 These measures will be instituted without unduly resorting to subsidies or incentives. At the same time, the Government will consider the efficacy of instituting penalties such as fines and surcharges on industries for non-compliance and contravention of existing laws in accordance with the 'polluter pay' principle.

15.61 The Government will improve standard codes and guidelines on the necessary measures to be undertaken towards control, abatement and disposal of industry-induced pollution. In addition, minimum standards covering ambient air, emissions and effluents, products as well as exposure to hazards in factories will also be improved.

15.62 As industrial development grows in importance, the proper storage, treatment and disposal of industrial wastes becomes increasingly necessary. In order to reduce hazards to the environment, new incentives giving pioneer status for activities to promote the proper storage, treatment and disposal of toxic and hazardous wastes by industries and import duty exemption schemes for machinery, equipment and raw materials as well as components imported for these purposes will be continued.

15.63 In addition to the general concern of the Government to ensure that adequate regulations exist to protect the environment, the private sector will be further encouraged to ensure that toxic and hazardous wastes are safely stored, treated and disposed. The Government is also studying the feasibility of establishing such facilities on a privatized basis. In the meantime, companies need to take adequate measures to provide their own facilities under the incentive programme. In addition, the practice of dumping wastes into the rivers, discharging untreated waste water into drains and burying toxic wastes in dumping sites will be closely monitored.

15.64 *Agricultural Development and Environment.* Intensification of agricultural production and minimization of crop losses from pests and diseases could lead to the use of more chemical fertilizers, pesticides and herbicides. In addition, agricultural mechanization also damages soil structure making it more prone to water erosion. Besides the resulting sedimentation and siltation of surface water from large-scale land-based development in agriculture, intensive use of chemical fertilizers, pesticides and herbicides result in serious groundwater pollution. Such contaminated water requires expensive biological and mechanical

filtering facilities before the water is usable for domestic and industrial purposes. Resulting from this groundwater pollution, some plants and animal species, including freshwater fish, have become extinct.

15.65 The feedmeals used in animal production could also cause soil pollution while the over-use of water and sustained irrigation produces salination. In addition, extensive land clearing and bringing wetlands under cultivation can lead to the loss of topsoil, biological diversity and wildlife habitat. In order to sustain the aesthetic value of the countryside, the destruction of hedges and the realignment of water courses will have to be restrained.

15.66 Large-scale modernized husbandry, like pig farming, as well as effective waste treatment and disposal system are urgently necessary to minimize the danger of water contamination, pollution of beaches, coastal and marine ecology. The Federal Government, with the cooperation of the states, will strictly control the expansion of industry through a more stringent permit system and specific guidelines on pollution control.

15.67 Consideration of the above issues raises the question of the balance between economic development and environmental protection. It has become increasingly necessary to integrate developmental and environmental policies to produce practical and effective solutions. Development, while promoting economic benefits, should not lead to deterioration of the environment. It should promote landscape amenity and conservation and reduce agricultural and industrial pollution.

Pollution from Consumer Products

15.68 In meeting the demands of modern living, industries have produced goods which enhance living standards and quality of life. The development of new technologies has not only reduced costs of production but has also resulted in consumer products which are increasingly accessible, affordable and durable. These conveniences of life could pose serious potential dangers to the environment if they are not safely disposed after use.

15.69 There is a lack of understanding of the possible environmental hazards of unorganized disposal especially in terms of polluting rivers and beaches. Wrappers, packaging materials and domestic refuse, a substantial proportion of which are plastics and aluminium-based materials, are not only not bio-degradable but are also not possible to be recycled for other uses.

15.70 Industries will continue to be encouraged to use environmentally-sound technologies and processes, produce bio-degradable products as well as recycle products. Consumers will have to be motivated to dispose their used products more systematically. Therefore, it is necessary to infuse public awareness of the adverse implications of unsystematic disposal of used products so that the dangers to health and environment are progressively reduced. Local government authorities will be required to take actions to systematically dispose domestic refuse and enforce public compliance.

Urbanization and Urban Growth

15.71 By the end of the Sixth Plan period, an estimated 45 per cent of Malaysians will be living in the urban areas. With increasing employment and income opportunities in the expanding industrial and services sectors, and increased educational levels, further out-migration from the rural areas is expected. Besides housing, additional urban facilities and amenities will have to be provided and existing ones improved so that dangers of pollution due to inadequate urban sanitation, and unorganized disposal of domestic sewage, solid wastes and wastewater are minimized. This is to ensure that water supply for domestic, industrial and recreational uses is not endangered.

15.72 Increased urbanization and expanding industries can also exacerbate environmental degradation due to smoke, gas emission, lead concentration as well as noise pollution. With increased income and expanding urban population, the number of vehicular traffic is expected to expand rapidly. Smog in major towns will continue to pose serious hazards to town dwellers. Despite the reduction of the lead content of petrol, urban air quality can be adversely affected by increased vehicle density, the lack of proper vehicle maintenance, less stringent enforcement of permissible exhaust emissions as well as a laxity of attitude. In order to mitigate environmental deterioration in urban areas, more preventive measures will be undertaken. In this regard, the Government will implement improvements to the modes of transportation in congested towns, including implementing a suitable light rail transit (LRT) system, double tracking rails and electric-powered trains and improving urban public transport as well as the location of housing estates in major towns.

15.73 Sewerage facilities will continue to be expanded to progressively control pollution of ground and surface water. Aside from expanding central sewerage projects for Pulau Pinang and Kuala Lumpur, and completing the Seremban sewerage project, sewerage schemes are also

being implemented in designated tourist resorts in Desaru, Port Dickson, Pulau Langkawi and Pulau Pangkor in order to sustain these resorts as principal tourist destinations. In addition, feasibility studies are being conducted for major towns like Kangar, Kota Bharu and Kuching. Suitable sanitation systems to improve the environment and counter pollution from sewage in densely populated coastal areas are also being considered. By the end of the Sixth Plan period, 8.5 per cent of the urban population would have been provided with centralized and decentralized sewerage facilities.

Research and Development

15.74 R&D programmes will continue to be carried out to develop more effective preventive measures towards pollution control and abatement. Besides consistent monitoring of the environment, studies will continue to be conducted to enable the Government to take corrective measures. R&D activities to develop efficient, practical and economical technologies for use in pollution control as well as exploring the feasibility of utilizing wastes for alternative economic uses will be undertaken. In addition, there is a need to intensify R&D in developing safer processes and products. Towards this end, public sector research institutions will have to devote a significant proportion of their time, funds and manpower for the purpose of augmenting efforts at sustaining, if not improving, environmental quality. The Government will allocate adequate funds under R&D for the purpose.

Integrated Project Planning

15.75 Under the integrated project planning approach, aside from EIAs, environmental considerations will continue to be integrated into project planning and implementation. The EIA, mandated under the Environmental Quality (Amendment) Act, 1985, and Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order, 1987, specifies 19 categories of 'prescribed activities'. Preliminary studies have shown that the costs of incorporating the EIA requirement were only marginal to the overall project costs. In addition, procedures for carrying out impact assessment were published in 1987 as the *Handbook of Environmental Impact Assessment Guidelines.*

15.76 The preparation of development and structure plans, infrastructure and conservation projects, sectoral and urban development programmes will continue to incorporate environmental considerations. With regard to projects not subject to EIA, the siting of potentially

polluting projects will be away from environmentally sensitive areas, such as residential areas, schools, hospitals and water catchment areas, especially if those areas are without sufficient buffers. Furthermore, mitigation and control measures to prevent and reduce the possibility of environmental pollution will also be given special consideration in implementing such projects.

15.77 Integrated project planning calls for increased Federal and state level cooperation in environmental management. Towards this end, State Action Committees have been formed to consider the environmental aspects of development projects. The meeting of Federal and State Ministers and State Executive Council members responsible for environmental affairs, initiated in 1989, will be continued to further enhance this cooperation.

International Cooperation and Transboundary Pollution

15.78 Malaysia has played an important role in promoting environmental consciousness in world fora. This was exemplified by Malaysia in obtaining the consensus of the Commonwealth Heads of Government in the Langkawi Declaration on the Environment. In addition, under the umbrella of the Association of South East Asian Nations (ASEAN) Committee on Science and Technology (COST), projects under the ASEAN Environmental Programme (ASEP) II (1983-87) and ASEP III (1988-91) were initiated and will continue during the Sixth Plan period. Further, the ASEAN Senior Officials on Environment (ASOEN) would focus on, *firstly*, strengthening ASEAN cooperation in the exchange of information, technology, resources and manpower in dealing with international environmental concerns; and, *secondly*, ensuring the integration of environmental dimensions in the decisions of other ASEAN Committees. During the Sixth Plan period, Malaysia is expected to continue benefiting from various cooperation programmes in marine sciences between ASEAN and its partners, namely, Australia, the United States of America (USA) and Canada.

15.79 A number of international environmental issues have implications on Malaysia. These relate to the build-up of greenhouse gases, climatic changes and the use of chloro-fluorocarbons (CFCs) which adversely affect the ozone layer. In accordance with the Montreal Protocol, Malaysia agreed to a total phase-out of controlled substances, including CFCs and halons, by the year 2000. Of greater concern to Malaysia is the indiscriminate export and dumping of hazardous chemicals and wastes across borders by multinational companies arising

from the industrial processes in the developed world. It is on this account that Malaysia is considering to become a signatory to the United Nations Environment Programme (UNEP) and the Basel Convention on the Control of Transboundary Movements and the Disposal of Hazardous Wastes, 1989. In addition, there is the potential danger of acid rain and the release of cancer-causing gases produced by chemical plants of the developed world reaching Malaysia through atmospheric movements.

Attitude, Values and Awareness

15.80 *Private Sector Awareness.* One of the greatest problems in the context of the environment is the commercial ethics of industrialists who are more concerned with maximizing profits rather than with the effects of industrial pollution on society. Production is expanded in order to reap economies of scale which generate faster rates of returns to capital investments without taking into account the need for instituting pollution control measures and installing anti-pollution devices.

15.81 *Public Awareness.* The lack of awareness among the general public may be due to insufficient understanding of the long-term consequences of pollution and environmental deterioration. This problem is more serious in the urban and semi-urban areas where facilities for disposal of solid waste and spent waters are not adequate. In the squatter areas where various types of wastes are disposed indiscriminately, the problem is even more serious. In activities related to the exploitation of natural resources such as timber and mangroves, the lack of concern is because of the presumption that such resources are given by nature and, therefore, a scarcity price is not tagged on these resources. A necessary strategy in the future will be to emphasize this awareness among the general public.

15.82 *Awareness Programme.* The impact of environmental degradation is a long-term one and the price for such deterioration will have to be paid by future generations. Pollution imposes external costs on others who are not the polluters. Therefore, they are passive and indifferent to the problem. Environmental degradation requires not only laws and regulations, strict compliance and enforcement but also dissemination of knowledge to the general public so that they are adequately informed. Greater exposure, increased knowledge and better scientific understanding of the environment is, therefore, essential. Knowledge and awareness influence attitudes and values towards caring more for the environment.

15.83 The effectiveness of environmental education, as a preventive strategy in environmental management, hinges upon careful planning, effective coordination and willingness and commitment among all environment-related agencies and organizations, both in and outside the Government. Malaysians must cooperate and complement efforts of the Government in creating a pollution-free environment and promoting sustainable resource development.

Framework for Institutional Cooperation

15.84 The preservation of the natural heritage of the nation and the promotion of biodiversity calls for setting aside areas as protected forests, marine and coastal recreational parks, wildlife sanctuaries and nature reserves. To compensate for the potential loss of revenue resources of states and the cost of managing these proposed programmes and projects, the Federal Government will enter into discussions with the state governments to explore greater sharing of financial responsibility of environmental-related projects between the Federal and state governments.

15.85 DOE is the principal agency entrusted with the responsibility to monitor the state of the environment and effectively enforce laws, rules and regulations governing the environment. In order to enable DOE and other public sector agencies to effectively and consistently monitor and evaluate the state of the environment and take steps to enforce the required measures, the environmental role of these agencies will be given priority. Therefore, beginning with the Sixth Plan, all public institutions will be required to collaborate and cooperate with DOE and effectively integrate environmental considerations in the planning and implementation of their programmes and projects. DOE will also be strengthened to enable it to play a developmental role as well as to be more effective in enforcement. These measures will ensure that in the exercise of their respective designated functions, the environment is seen as an integral component of the strategies and programmes of public sector agencies.

15.86 A major problem in the past was inadequate coordination of environment-related policies, strategies and programmes. In order to rectify these deficiencies, and to ensure that all public agencies give due priority to the maintenance of good environmental conditions, as well as promote sustainable development and minimize environmental degradation, the Government will set up the National Council for the Environment (NCE) to coordinate the functioning of all agencies,

consider strategies and programmes which have implications on the environment and advise the Government on policies towards a more holistic approach to environmental management.

IV. ALLOCATION

15.87 The Federal development allocation for programmes to ensure the maintenance of sustainable development and the effective management of the environment is reflected in components of sectoral allocation placed under the control of the respective agencies. DOE, will be allocated $40.35 million to carry out research as well as implement projects for the betterment of the environment. Among major projects to be implemented include the Control of Air and Noise Pollution, Environmental Impact Assessments and Control of Water and Marine Pollution. In addition, DOE will also embark on programmes such as Environment Information and Education, and the formulation of guidelines and regulations pertaining to environmental control.

15.88 Apart from DOE, other relevant ministries such as the Ministry of Agriculture, the Ministry of International Trade and Industry, the Ministry of Rural Development, and the Ministry of Land and Cooperative Development and their agencies, will also be given allocations to incorporate the environmental aspects into their programmes and projects wherever relevant, in order to help sustain a clean and healthy environment.

V. CONCLUSION

15.89 Consistent with the spirit of the Langkawi Declaration on the Environment, the policy of promoting sustainable development will be given priority. This policy will cover strategies affecting sectoral growth and equitable distribution, in particular the optimum utilization of national depletable and renewable resources. The efficient utilization of these resources has a close bearing on the development of the states dependent on them. Focus will be given to conservation, environment and ecological balance within the context of sustainable development.