

Environmental Quality Report 1993



Department of Environment
Ministry of Science,
Technology and the Environment
Malaysia

***Environmental
Quality Report
1993***



Environmental Quality Report 1993



Department of Environment
Ministry of Science, Technology and the Environment
Malaysia
30th September 1994

Department of Environment, Malaysia

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Foreword

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Persuant to Section 3 (1)(i) of the Environmental Quality Act of 1974 and in fulfilling one of the principal duties of the Director-General of Environmental Quality Malaysia, the 1993 Environmental Quality Report is hereby presented.

The overall conditions of the environment in terms of the quality of ambient air, river and coastal waters continued to be monitored regularly throughout the country. With the increase in sales of unleaded petrol (ULP), the amount of lead (Pb) in the air continued to decline further, but the amount of dust particulates, particularly in the urban areas, was on the increase largely due to excessive emissions from diesel-powered vehicles. The quality of the country's rivers continued to deteriorate at an annual rate of 2.7 per cent, particularly in terms of silt and suspended sediments due to uncontrolled earthworks. As a result, the concentration of total suspended solids in the coastal waters had further deteriorated by 34 per cent.

Enforcement action alone, though increased by the order of 86 to 107 per cent, could not possibly bring about the expected improvement in the overall conditions of the environment. The restructuring of various economic sectors would have to be put in place. The solution to air pollution problems in particular would rest beyond the transport sector into the area of advanced communication and greater application of information technology. With the implementation of privatised sewerage schemes nationwide, the country's rivers and coastal waters would be free from partially treated or untreated sewage, but the control of soil erosion during earthworks must take priority in the building and construction industries. Otherwise, 56 per cent or more of the country's rivers would remain polluted by silt more than any other contaminants.

In the meantime, however, much progress had been made in pollution prevention, as the number of projects screened under the mandatory environmental impact assessment (EIA) procedure increased by 43 per cent; evaluated for suitable siting by 16 per cent; checked for proper installation of fuel burning equipment by 43 per cent; and approved systems for wastewater treatment by 17 per cent. As a longterm measure, public awareness programmes had been further strengthened; the number of environmental exhibits increased by 177 per cent, lectures on the subject of environment by

x

91 per cent, press cuttings on the environment by 25 per cent, and public use of the DOE library increased by 90 per cent.

Through the publication of this report, like other environmental information series published by the Department of Environment, the environmental issues

and responses in Malaysia could be fully addressed on a regular basis. Every effort towards meeting the objectives of development that is balanced and sustainable for present and future generations should continue to receive the support and co-operation of all concerned.



(Dato' Dr. Abu Bakar Jaafar, *DPMP, JSM, KMN*)
Director-General of Environmental Quality,
Malaysia
30th September 1994

Abbreviations

AAECP	ASEAN-Australia Economic Co-operation Programme
ACI	Action Committee on Industries
ACPMS	ASEAN Co-operative Programme on Marine Science
ASEAN	Association of South East Asian Nations
ASOEN	ASEAN Senior Officials on the Environment
BIM	Balai Ikhtisas Malaysia
BOD	Biochemical Oxygen Demand
CFC	Chlorofluorocarbon(s)
CICM	Chemical Industries Council of Malaysia
COBSEA	Co-ordinating Body on the Seas of East Asia
COD	Chemical Oxygen Demand
CP	Country Programme
CPO	Crude Palm Oil
dB	decibel(s)
DG	Director-General
DNA	Designated National Authority
DOE	Department of Environment
<i>E. coli</i>	<i>Escherichia coli</i>
EIA	Environmental Impact Assessment
EIP	Environmental Improvement Project
EPSM	Environmental Protection Society of Malaysia
EPU	Economic Planning Unit
EQA	Environmental Quality Act
EQC	Environmental Quality Council
EQR	Environmental Quality Report
ESCAP	Economic and Social Commission for Asia and the Pacific
EXCO	Executive Council
EXCOM	Executive Committee
FMM	Federation of Malaysia Manufacturers
GIS	Geographic Information System
HSU	Hartridge Smoke Unit(s)
IMJCE	Indonesia-Malaysia Joint Committee on the Environment
INFOTERRA	International Referral System for Sources of Environmental Information
IPCS	International Programme on Chemical Safety
IRPTC	International Register of Potentially Toxic Chemicals
ITM	Institut Teknologi Mara
JEMA	Japanese Electronic Malaysian Association

JICA	Japan International Co-operation Agency
MIDA	Malaysian Industrial Development Authority
MITI	Ministry of International Trade and Industry
MNS	Malayan Nature Society
MOA	Ministry of Agriculture
MOH	Ministry of Health
MOHR	Ministry of Human Resources
MOPGC	Malaysian Oil Palm Growers' Council
MOSTE	Ministry of Science, Technology and the Environment
MOT	Ministry of Transport
MRPC	Malaysian Rubber Producers Council
MSJCE	Malaysia-Singapore Joint Committee on the Environment
NFP	National Focal Point
NRPTC	National Register of Potentially Toxic Chemicals
NSC	National Steering Committee
NGO	Non-Government Organisation
NH ₃ N	Ammoniacal Nitrogen
ODS	Ozone-Depleting Substance(s)
PBB	Polybrominated Biphenyls
PCB	Polychlorinated Biphenyls
PCT	Polychlorinated Triphenyls
PIC	Prior Informed Consent
PM	Particulate Matter
RM	Ringgit Malaysia
RNR	Raw Natural Rubber
SS	Suspended Solids
SOP	Standard Operating Procedure
TCC	Technical Committee on Banned and Severely Restricted Chemicals
TOR	Terms of Reference
TSP	Total Suspended Particulate
UIA	Universiti Islam Antarabangsa
UKM	Universiti Kebangsaan Malaysia
UM	Universiti Malaya
UN	United Nations
UPM	Universiti Pertanian Malaysia
USM	Universiti Sains Malaysia
UTM	Universiti Teknologi Malaysia
UUM	Universiti Utara Malaysia
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organisation
USEPA	United States Environmental Protection Agency
WQI	Water Quality Index

Overview

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During the year 1993, the activities of the Department of Environment (DOE) focussed increasingly more on prevention than on curative measures. At the same time, the enforcement of the Environmental Quality Act, 1974 and its regulations had been further strengthened by escalating the degree of stringency of measures, particularly against repeat offenders. As the water pollution from the palm oil and rubber industries had been greatly reduced by as much as 90 per cent, and industrial emissions had been cut down to a level that the only remaining source of significance was the emission from motor vehicles. Thus, the emphasis of the enforcement programmes was on mobile sources of pollution. During the year, the DOE stepped-up its enforcement work by 107 per cent to control excessive dark smoke emission from motor vehicles.

The need to improve the compliance of the other sources of pollution continued to be given priority as reflected in the increase in the number of factory inspections by 34 per cent, directives and notices issued to polluting factory owners by 49 per cent, and that of prosecution cases by 86 per cent. The year 1993 also saw the decrease by 64 per cent in the number of contravention licences issued. As an exercise toward greater deregulation, this licensing mechanism had proven in the past to be an effective approach for industries to make rapid progress in complying with the relevant

standards being enforced that was made possible by the effective application of the polluters' pay principle namely, escalating pollution charges or fees imposed proportional to the quality and quantity of discharge, thus greater techno-economic efficiency and equity among small and big industries.

The promotion of environmental education and wider dissemination of information, as a tool for creating greater environmental awareness and as a preventive strategy in environmental management had also been given a high priority as reflected by the increase in the number of environmental exhibitions by 177 per cent; talks and lectures to school children, seminars and workshops to the general public by 91 per cent; media coverage by 25 per cent; and that of DOE library users by 90 per cent.

The year 1993 also saw some changes in the functional arrangement of DOE. To ensure that environmental factors were considered at the early stages of project planning, the decentralisation of the review and approval of EIA reports was put in place with a number of DOE State Offices, namely, Pulau Pinang, Perak, Selangor and Wilayah Persekutuan Kuala Lumpur, Johor, and Sarawak given the powers in decision making. This decentralisation process was implemented in stages to ensure that work could be carried out more effectively without any hitches. The average time taken for approval was reduced from 6.1 months

in 1991 to 2.9 months in 1993, despite the fact that the workload had increased by 43 per cent.

In 1993, the assessment of river and marine quality throughout the country revealed that the overall quality of our rivers and coastal waters had yet to improve. Malaysian rivers remained heavily polluted, more by suspended solids due to uncontrolled earthworks than by any other types of pollutants and correspondingly, our coastal waters, being the downstream receivers, also showed high concentration of suspended solids. Also disappointing was the prevalence of *E.coli* in our coastal waters due to the discharge of partially treated or untreated domestic sewage and animal wastes. As the major sources of both the organic and inorganic wastes which constituted the most significant and serious form of

pollutants affecting the Malaysian water environment were beyond the mandate of the DOE, the efforts of various local authorities to control soil erosion from development works as well as to manage effectively the collection and disposal of household municipal, and non-toxic industrial waste were expected to be more forthcoming than ever before.

Despite the disappointing trends in the overall environmental quality, the Department of Environment could be proud of its own achievements during the year, especially with the increase in the productivity and performance of its various programmes by as much as 177 per cent, even with a modest increase in both manpower and financial allocation by 12 to 14 per cent. Indeed, the DOE had lived up to the expectations of all concerned.

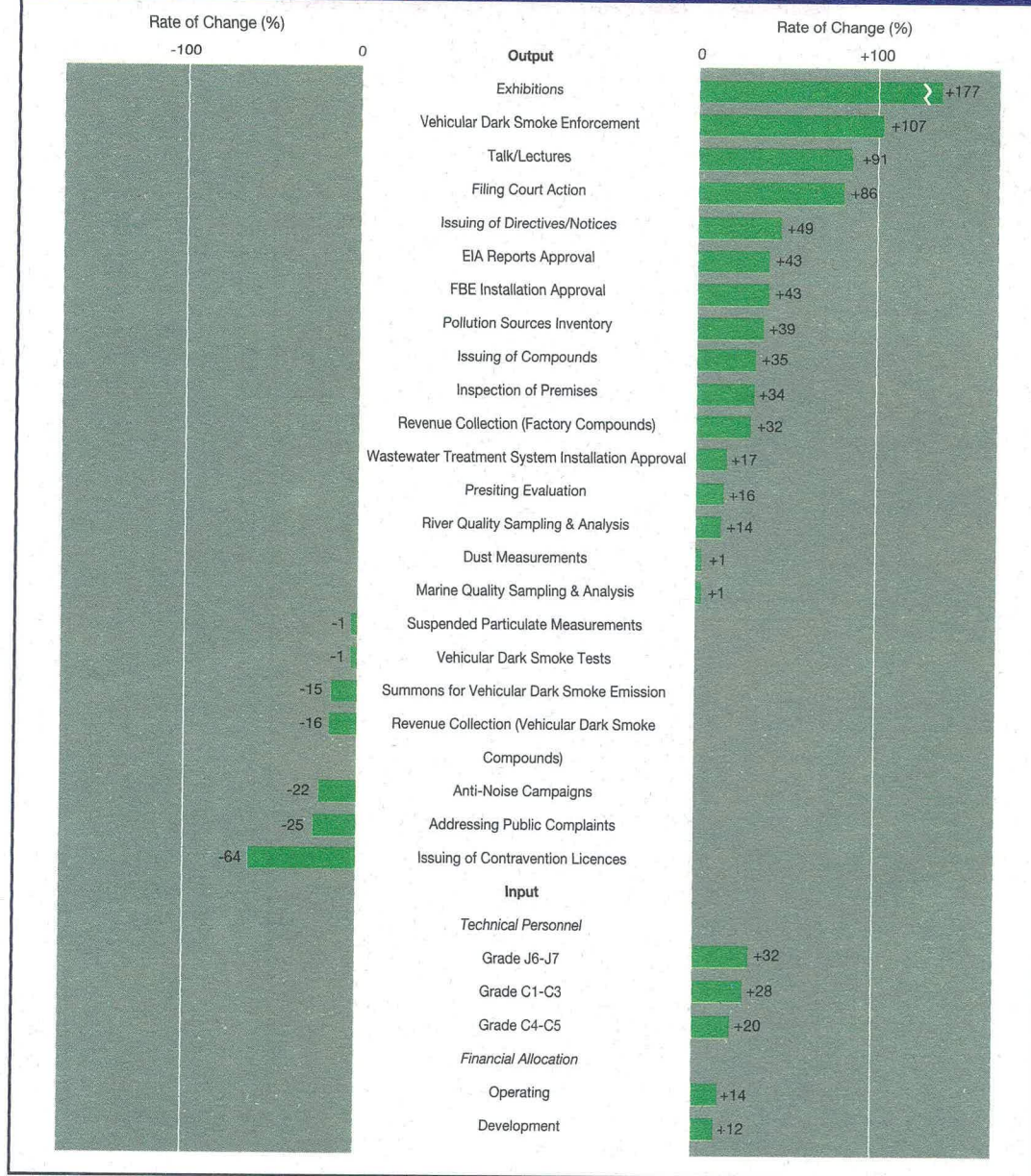


Macro Indicators for the State of Environment and Public Awareness, 1977-1993

Note: + Improve
- Decline

MICRO INDICATORS

XV



Note:

+ Improve
- Decline

Acronym:

EIA Environmental Impact Assessment
FBE Fuel Burning Equipment

**Department of
Environment
Productivity by
Input and Output
Indicators, 1975-
1993**

Changes in Air Quality, 1988-1993

Changes in Air Quality, 1988-1993

	Pollutant	Trend (%)	Rate of Change (%)
Sulphur Dioxide	SO ₂	84 ↑ 16 ↓	+31.0
Carbon Monoxide	CO	67 ↑ 33 ↓	+14.6
Nitrogen Dioxide	NO ₂	50 ↑ 50 ↓	+13.5
Particulate Matter (less than 10 micron in size)	PM10	33 ↑ 67 ↓	+0.6
Lead	Pb	56 ↑ 36 ↓ 8 → ←	+0.6
Total Suspended Particulate	TSP	72 ↑ 27 ↓ 1 → ←	-0.3
Ozone ¹	O ₃	67 ↑ 33 ↓	-8.9

Legend:
+ Improve (Red arrow pointing up)
- Decline (Red arrow pointing down)

Note:
¹ The measurement of this contaminant has been carried out at ground level. This is not the ozone layer in the stratosphere.

Note:
¹ The measurement of this contaminant has been carried out at ground level. This is not the ozone layer in the stratosphere.

Chapter 1

Environmental Quality Council





INTRODUCTION

The Environmental Quality Council (EQC), established under Section 4(1) of the Environmental Quality Act, 1974, and launched on April 12, 1977, serves to advise the Minister of Science, Technology and the Environment on matters pertaining to the Act and on any matter referred to it by the Minister. The Council also provides guidance to the DOE in the formulation of policies and strategies related to environmental protection and management, including the setting of standards and regulations to be adopted by the country. By virtue of its broad representation from both public and private sectors, it follows that the deliberations and decisions of the EQC will take into account the needs and interests of the whole spectrum of society.

ACTIVITIES

In 1993, the Council met in Kuala Lumpur on three occasions on May 3, August 2, and December 4. During the year, the Council continued to provide guidance to the DOE in formulating policies and strategies related to environmental protection and management as well as on various aspects of environmental management, from control strategies to prevention and management, and in creating awareness on the importance of environment.

During the course of 1993, the activities of the Council were focussed on various issues ranging from legal matters to enforcement and environmental education programmes. The Council provided advice on the proposal for the control of chlorofluoro-carbons (CFCs)

and ozone depleting substances (ODS) in line with the requirements of the Montreal Protocol. The Council also considered the review of the environmental legislations and in particular the EQA, and also on the need for the delegation of powers for the control of motor vehicle noise.

The Council also considered efforts to strengthen the existing pollution control programme through joint enforcement with the Royal Malaysian Police Air Wing, to monitor polluting activities from the air, in view of the increasing number of public complaints on widespread open burning activities.

The Council also presented the EQC special report to highlight its future direction, the changes in its role in line with the changes in the DOE itself, where greater demands and aspirations for a cleaner and healthier environment have frequently been stressed upon and demanded for, thus thrusting heavier responsibilities on the Department. Furthermore, the Council has to play a greater role in response to the new challenges that have emerged relating to economics and international trade, and a sustainable development. The Council is set to play a vital role in providing and advising the Minister on the strategies and programmes towards a more holistic approach to environmental management.

Other than the issues highlighted, the Council also deliberated on other matters such as the streamlining of the EIA review system and procedure, and the approval of reports, promotion of environmental audits, as well as the enhancements of programmes and activities for Environmental Education and Information.

ENVIRONMENTAL QUALITY COUNCIL

3

Chairman

Y. Bhg. Tan Sri Datuk Dr. Hamzah bin Sendut

DOE

Dato' Dr. Abu Bakar bin Jaafar

Academic

UKM

Prof. Dr. Mohd. Sham bin Mohd. Sani

State

Sabah

Y. Bhg. Datuk Wilfred
Lingham

Sarawak

Encik Darrell Tsen Nyuk
Choi

Federal

MOSTE

Encik V. Danabalan
Y. Bhg. Dato' Haji Jimin
bin Idris

MITI

Encik Mohd. Harith bin
Sidik

MOA

Y. Bhg. Dato' Ir. Tuan
Haji Shahrizaila bin
Abdullah

MOHR

Ir. Zakaria bin Nanyan

MOT

Encik Ahmad Pharmy bin
Abdul Rahman

MOH

Ir. Lum Weng Kee

Industry

Petroleum

Ir. Hussein bin Rahmat

MOPGC

Dr. Haji Mohd. Tusirin
bin Haji Mohd. Nor

FMM

Tuan Haji Mohamed
Saufi bin Haji Abdullah

MRPC

Ir. Yeo Siow Poh

Society

EPSM

Ir. Gurmit Singh K.S.

BIM

Y. Bhg. Datuk Haji Mohd.
Ishak bin Haji Mohd. Ariff





**The Environmental Quality Council
Members, 1993**

Chapter 2

State of the Environment





Monitoring of air quality in 1993 was carried out using two types of monitoring equipment. The continuous automatic monitors which use sophisticated electronic techniques to give instantaneous results of air pollution concentrations were installed at four sites in the Klang Valley region. This type of equipment allowed for peak concentrations to be measured. The main advantage of using this technique was that it enabled data to be readily transmitted to a central computer system by means of telemetry. The second technique which was simple and less sensitive, have longer averaging times, typically 24 hours to one month. There were 35 sites of this type, mainly to measure total suspended particulate (TSP) and PM-10.

The continuous monitoring techniques were used to monitor gaseous pollutants such as carbon monoxide, sulphur dioxide, oxides of nitrogen and ozone, as well as suspended particulate matter (PM-10), and total hydrocarbon.

The location of these air monitoring stations is an important consideration in any air quality monitoring network. The 4 categories of sites used are: industrial, residential, commercial and heavily trafficked areas.

Under the Annual Air Quality Monitoring Programme in 1993, the measurements of total suspended particulates (TSP), atmospheric lead, and heavy metals were continued at 27 monitoring stations using the High Volume Sampler. The respirable particles were measured at eight monitoring stations, mainly at residential areas. The total number of samples collected for TSP was 1,724 showing a

percentage achievement of 76 per cent compared to 82 per cent the previous year.

The focus of most air emission control regulations and other related legislations is on the protection of human health and on the prevention of environment degradation. However, in Malaysia, the aspect of air pollution that is of great concern to the general public is the nuisance effects of fumes, odours, dust and dirt. Figures 2.1 and 2.2 clearly show that nitrogen particulate and dioxide matter were respectively, the most pervasive air pollutants in 1993, particularly in the Kuala Lumpur/Petaling Jaya/Shah Alam belt which has an estimated population of about 2 million. Motor vehicles were found to be the main sources of air pollution, although other sources such as industries and construction activities also contributed to localised effects.

An air quality study in the Klang Valley conducted during the period of 1992-1993 revealed that the main composition of particulate matters (PM-10) was diesel, arising mainly from vehicular emission of commercial motor vehicles, particularly lorries, buses and taxis. As shown in Figure 2.3, the carbon particulates emitted by diesel engines constitute 36 per cent of the total composition of particulate matter (PM-10) in the atmosphere.

The quality of air is still very much influenced by the degree of urbanisation, concentrating particulates, either total suspended or respirable, in the cities within the industrial corridor from Pulau Pinang to Johor Bahru. As shown in Figure 2.4, the annual average trends of TSP show that the TSP concentration in Johor Bahru and Georgetown in 1993 exceeded the recommended Malaysian



Figure 2.1
Malaysia:
Number of People
Exposed to
Particulate Matter
(PM₁₀), 1993

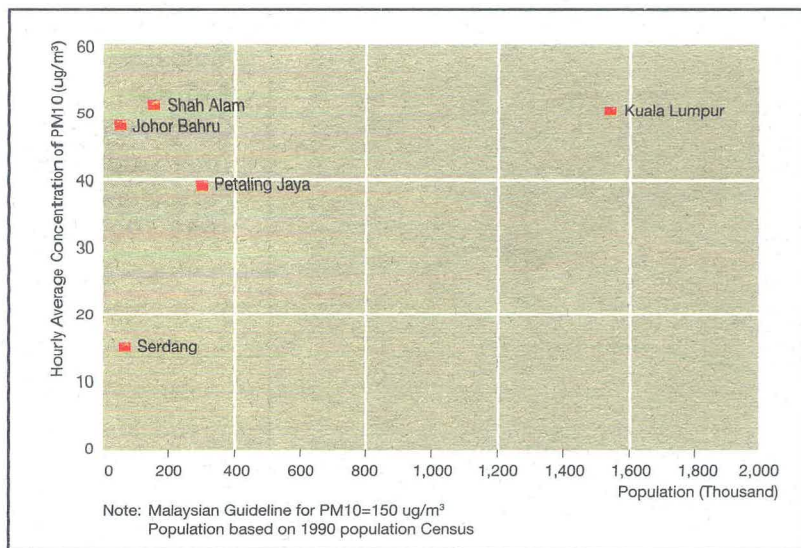


Figure 2.2
Malaysia:
Number of People
Exposed to
Nitrogen Dioxide
(NO₂), 1993

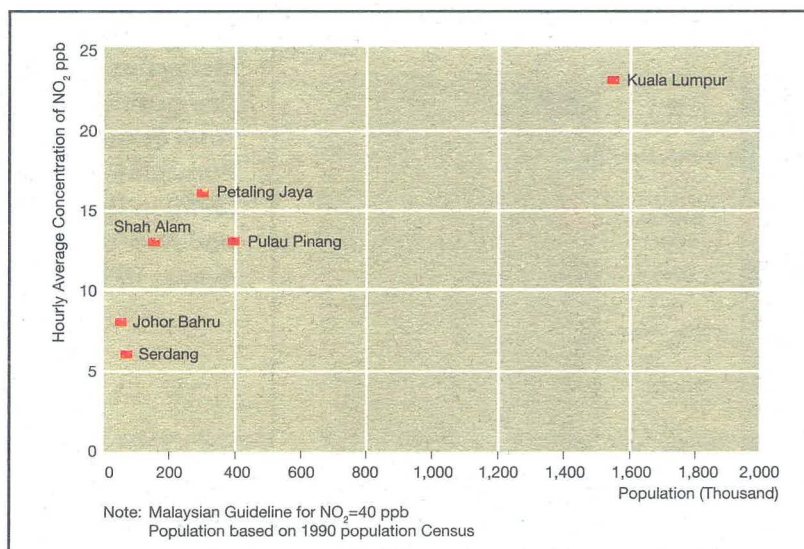
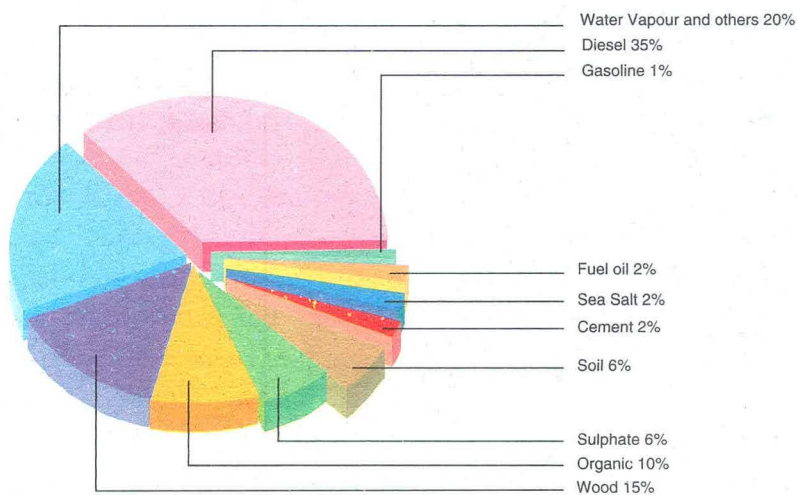
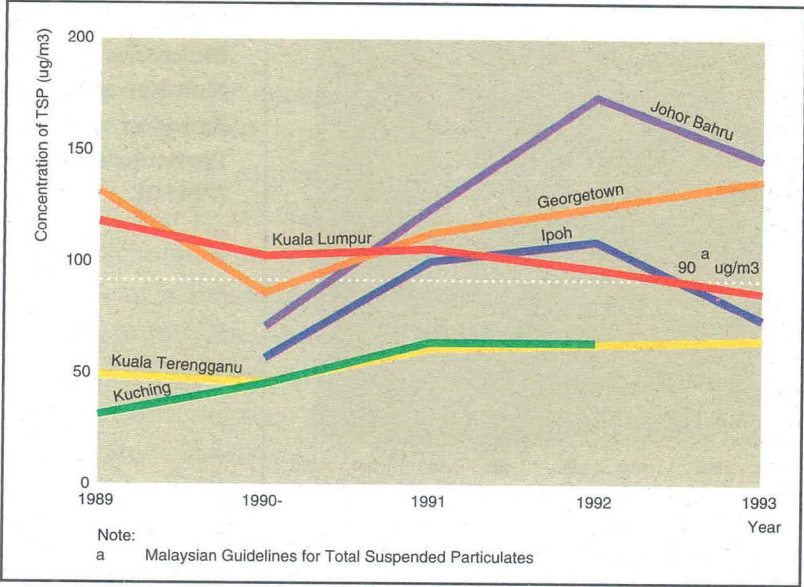
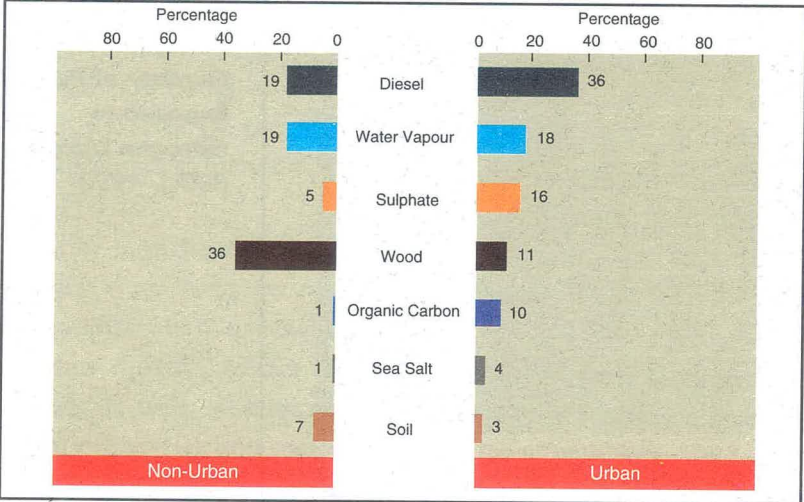


Figure 2.3
Klang Valley:
Average
Composition of
PM₁₀ by Source,
1992-1993

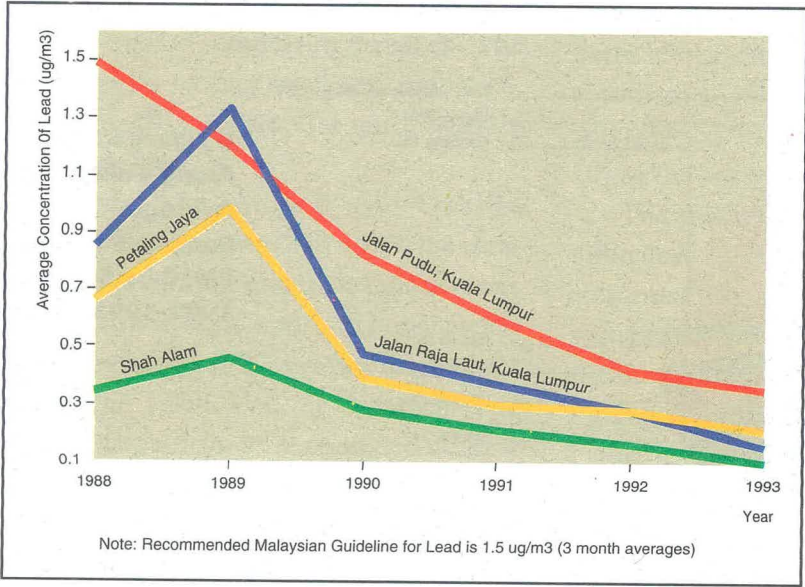




■ **Figure 2.4**
Malaysia:
Average
Concentration of
Total Suspended
Particulates (TSP),
1989-1993



■ **Figure 2.5**
Malaysia:
Composition of
Total Suspended
Particulate Matter
(SPM) in Urban
and Non-Urban
Areas, 1993



■ **Figure 2.6**
Kuala Lumpur &
Selangor: Annual
Average
Concentration of
Lead, 1988-1993



Guidelines of $90 \mu\text{g}/\text{m}^3$, while that of Ipoh and Kuala Lumpur improved as compared to 1992. The reduction of TSP in certain regions was made effective by means of controlling fugitive dust from roads and stricter enforcement on industrial sources.

Open burning activities arising from the housing and agricultural sectors were still the major sources of total suspended particulate matter. As illustrated in Figure 2.5, open burning of wood wastes constituted 36 per cent of TSP in the non-urban areas, while diesel vehicles were the main sources of TSP in urban areas.

The control of lead (Pb) through the enforcement of the Environmental Quality (Control of Lead Concentration in Motor Gasoline) Regulations 1985, has resulted in lower ambient Pb levels. Figure 2.6 shows a marked decrease in the average ambient lead concentrations in the Klang Valley region over the period of 1988 to 1993.

Air Quality Management Study For Klang Valley Region

A study on air quality management in the Klang Valley region was carried out between January 1992 to June 1993 with the assistance of a JICA Study Team, under the Technical Co-operation Programme with the Japanese Government. The findings from the JICA study indicated the seriousness of air pollution in the Klang Valley during the study period. Throughout the study period, the annual and daily averages of PM-10 at Shah Alam exceeded the Malaysian Guideline. The hourly measurement for CO, SO₂ and NO₂ at City Hall, Petaling Jaya and Shah Alam exceeded the recommended Guideline. The study

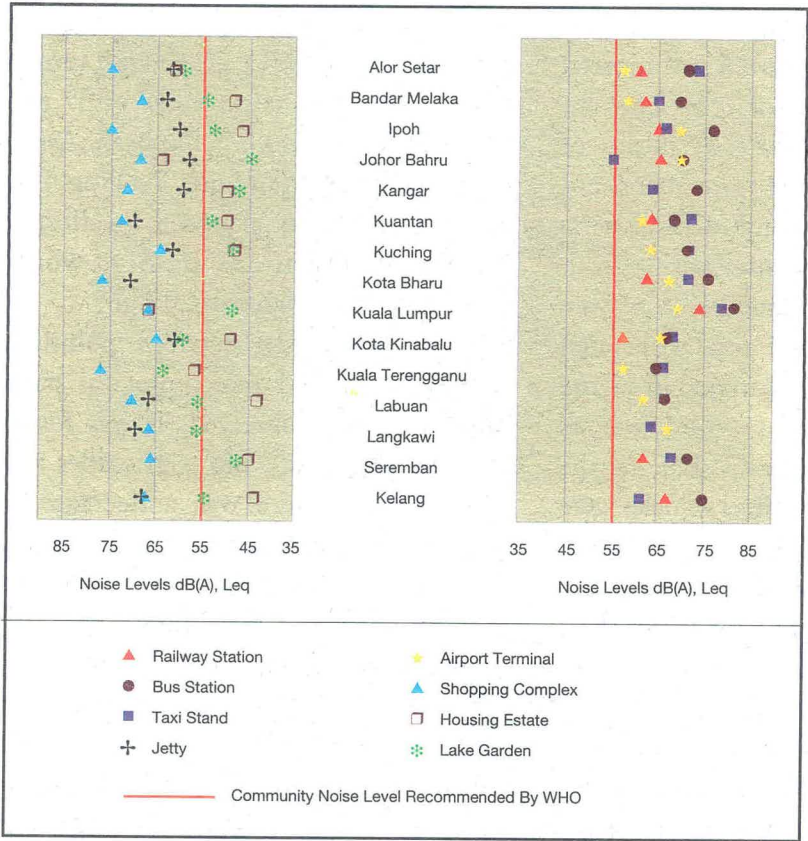
predicted that by the year 2005, the concentration of NO₂ in Kuala Lumpur would exceed the target value of 37 ppb if no control measure is imposed. As for SO₂, Kuala Lumpur and Petaling Jaya would be the potential areas to be affected, where concentrations of SO₂ would exceed the target value of 20 ppb.

The correlation between pollutant concentration and meteorological parameters was also observed. It was found that for SPM, CO, nitrogen oxides and hydrocarbon, there was a decrease in concentration with increase in wind speed. However, under strong stable conditions the concentrations were higher, with O₃ showing the reverse. Overall, the study concluded that the air pollution in Klang Valley was relatively serious and could worsen if meteorological conditions were not favourable and control measures not urgently instituted.

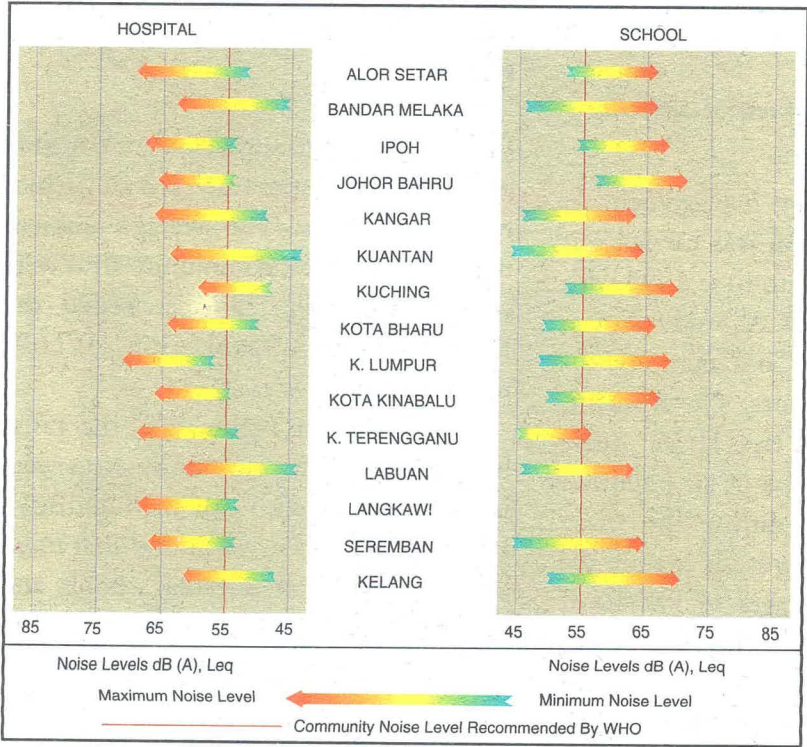
NOISE

In 1993, noise measurements were mainly conducted in community areas of major towns and cities. The average ambient noise levels in most community areas were considerably high, and exceeded the World Health Organisation (WHO) recommended levels.

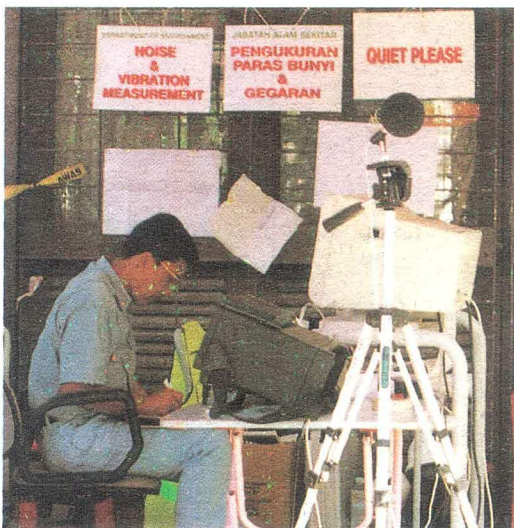
As shown in Figure 2.7, the noise levels recorded in community areas were in the range of 43.6 dB(A)-81.1 dB(A). From Figure 2.8, it was found that noise levels measured at selected schools and hospitals were in the range of 42.1-69.6 dB(A) and 42.7-72.2 dB(A), respectively.



■ **Figure 2.7**
Malaysia: Noise Level Measurements in Community Areas, 1993



■ **Figure 2.8**
Malaysia: Noise Level Measurements at Selected Schools and Hospitals, 1993



▲ Noise and Vibration Measurement
▲ at Highland Towers Site
(December 1993)



RIVER WATER QUALITY

Under the 1993 Annual River Water Quality Monitoring Programme, 116 major rivers were monitored. A total of 4,078 samples from 892 monitoring stations were collected, showing an increase of 15 per cent compared to the number collected in 1992.

Appraisal of the water quality based on the Water Quality Index (WQI) for five parameters namely, Biochemical Oxygen Demand (BOD₅), Chemical Oxygen Demand (COD), Ammoniacal Nitrogen (NH₃N), Suspended Solids (SS) and pH showed that between 1987-1993 the river water quality had been deteriorating at a rate of 1.19 per cent per year.

The number of polluted rivers had increased from 7 (8%) in 1992 to 11 (9%) in 1993, while rivers slightly polluted had increased in number from 55 in 1992 to 73 in 1993. Correspondingly, the number

of clean rivers had decreased from 29% (25) in 1992 to 28% (32) in 1993.

The two main parameters namely, SS and BOD₅ showed deterioration while NH₃N showed a slight improvement over the previous year. Figure 2.9 shows that siltation, sewage and animal waste remained the major problems of water pollution in Malaysia. Among these three parameters, deterioration in terms of SS was highest at a rate of 2.72 per cent, followed by NH₃N at a rate of 1.10 per cent, and BOD₅ the lowest at a rate of 0.41 per cent. This analysis indicates that silt (from soil erosion) and organic loadings (especially from sewage and animal wastes) were still the major contributors to river pollution.

Heavy metals were monitored only at selected rivers, whose levels were significant based on past years data and the presence of the most probable pollution sources. It was found that in certain rivers,

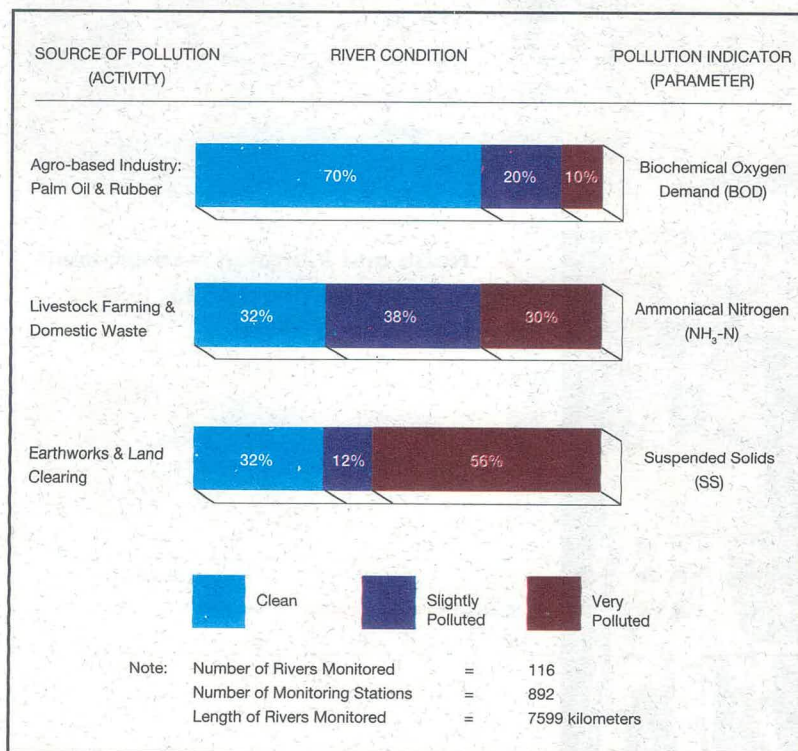


Figure 2.9
Malaysia: Status
of River Water
Quality Based on
Activity, 1993



arsenic, cadmium, mercury and lead levels had exceeded the Interim National Water Quality Standards For Class III in Malaysia. Five rivers in Johor recorded high percentage of samples exceeding the standard value of 0.4 mg/l for arsenic, with Sungai Skudai recording the highest value of 1.97 mg/l. Cadmium levels exceeding the standard of 0.01 mg/l were detected in 3 main rivers in Terengganu namely, Sungai Setiu (0.024 mg/l), Sungai Terengganu (0.017 mg/l) and Sungai Dungun (0.014 mg/l). Out of 73 rivers monitored for heavy metals, 16 rivers (15 in Johor and 1 in Perak) recorded high percentages of samples exceeding the standard value of 0.004 mg/l for mercury. The highest level of 0.49 mg/l was recorded in Sungai Tukang Batu, Johor. Lead levels were found relatively high, exceeding the standard value of 0.02 mg/l in 34 rivers, especially in the State of Sabah. The highest level of 0.28 mg/l was recorded in Sungai Brantian, Sabah, followed by Sungai Setiu, Terengganu with 0.10 mg/l.

Klang River 10-Year Clean Up Programme

In 1992, the Government embarked on a 10-year programme to clean up Klang River and its main tributaries. Nine sub-programmes/activities were formulated:

- Cleaning of Klang River (river alignments and installation of debris traps);
- Cleaning of Klang River (debris collection);
- Desilting;
- Beautification;
- Resettlement of Squatters;
- Pig-waste Treatment;
- Rehabilitation of Fish Life;
- Public Education and Awareness; and
- Water Pollution Control.

The implementation of this programme involves the input and co-operation of several Ministries and Government agencies.



The Water Pollution Control Sub-programme was entrusted to the Department of Environment. This programme was aimed at controlling point and non-point pollution sources. The scope of work included water quality monitoring programme, co-ordination of enforcement efforts under the Environmental Quality Act, 1974, and its Regulations and other relevant legislations, as well as development of an application system for the monitoring and enforcement information management through the utilisation of the Geographical Information System (GIS). Under this sub-programme, a plan of action to control pollution from earth-work activities, livestock and industries would be prepared by the relevant regulatory agencies.

“Love Our Rivers” Campaign

The campaign on “Love Our Rivers” which involved various Government agencies including the DOE was launched on February 20, 1993. Under this campaign, 6 sub-programmes were initiated namely, River Adoption, River Expedition, Education and Awareness, River Beautification, International Symposium, and River Watch. The “River Watch” sub-programme was co-ordinated by the DOE and included activities such as river monitoring and assessment which involved secondary school children from 29 schools throughout the country. Results of the river monitoring were submitted to the Department for further assessment. A symposium to discuss the River Watch programme would be held in 1994, whereby participating schools would be invited to present their findings.

MARINE ENVIRONMENTAL QUALITY

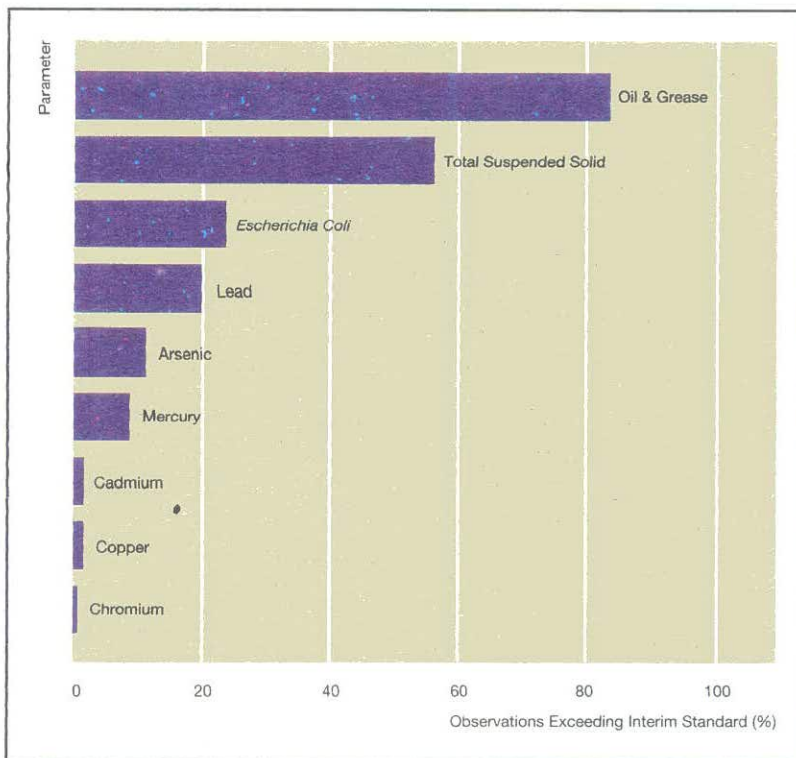
In 1993, the monitoring programme for marine environmental quality was carried out for 229 sites, resulting in a total of 996 samples collected. Oil and grease, *Escherichia coli* (*E. coli*) and total suspended solids (TSS) again prevailed as main contaminants of the coastal environment, being the accumulation of discharges from all kinds of development activities on land as shown in Figure 2.10. Heavy metals were also detected along the coastal waters of Malaysia.

The concentrations of total suspended solids over the 4-year period of 1989-1993 had deteriorated at a rate of 34% per site per year, whereas oil and grease had deteriorated at a rate of 10% per site per year, and faecal coliform at a rate of 34% per site per year. About 83 per cent of the total number of sites were polluted by oil and grease, 61 per cent by *Escherichia coli* (*E.coli*) and 59 per cent by total suspended solids.

The States of Kedah, Melaka and Negri Sembilan on the west coast, and Kelantan and Terengganu on the east coast of Peninsula Malaysia were the worst areas affected by oil and grease, indicating 100% non-compliance with the Proposed Interim Standard of 0 mg/l; followed by Sabah, Selangor, Pulau Pinang and Johor. *E.coli* readings were highest off the States of Johor, Melaka, Negri Sembilan and Selangor; while the coasts off Kedah, Pulau Pinang, Perak, Kelantan and Terengganu showed 100% compliance with the Proposed Interim Standard of 100 MPN/100 ml. The greatest improvement was evident off Pulau Pinang where the *E.coli* readings were highest the previous year.



■ **Figure 2.10**
Malaysia: Status
of Marine
Environmental
Quality, 1993



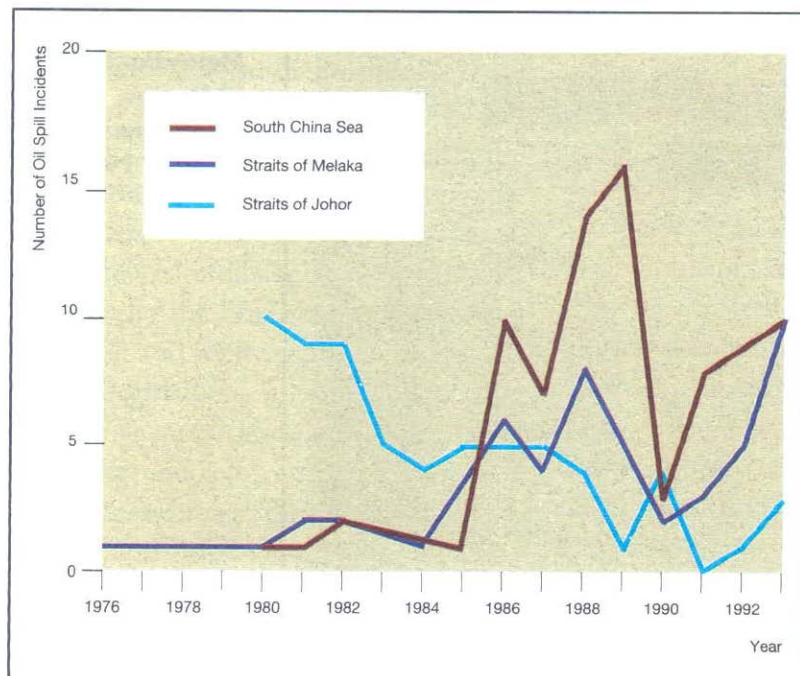
The distribution of TSS remained evident on either side of the Peninsular namely, off Perak and Pulau Pinang in the west; Kelantan, Pahang and Terengganu in the east; and Sarawak across the South China Sea. These States recorded the highest percentages of non-compliance with the Proposed Interim Standard of 50 mg/l for TSS.

Heavy metal measurements showed that Perak and Sabah recorded highest incidences of lead in their coastal waters, the latter also recording high arsenic content with 100% non-compliance with the Proposed Interim Standard of 0.1 mg/l. Meanwhile, significant levels of mercury were found along the Johor coastline.

More than 95 per cent of the beaches were found to be free from oil pollution in the form of tarballs. However, some beaches in Johor and Pahang were highly affected by this type of pollution.

Oil Spill Incidents

Accidental oil spills are usually of greatest concern since they often give rise to acute pollution along the coastline. Monitoring of oil spill incidents in the Malaysian waters continued to be one of the major activities of the Department of Environment. In 1993, 20 spill incidents were reported, 10 in the South China Sea and the rest in the Straits of Melaka, as shown in Figure 2.11. Generally, only minor spill incidences were recorded in 1993 compared to 1992. Most of the incidents reported were due to minor collision, pipeline leak, oily water discharges, leakages during transfer and tanker cleaning activities. The biggest of these occurred when the oil tanker MT Maersk Navigator collided with another oil tanker MT Sanko Honour at the Andaman Sea, Northern Sumatera on January 21, 1993, spilling about 27,000 tonnes of crude oil



■ **Figure 2.11**
Malaysia: Trend
of Oil Spill
Incidents,
1976-1993.

into the sea. In response, the National Oil Spill Contingency Plan was activated and precautionary steps were taken for about a month until the MT Maersk Navigator was safely towed to Singapore on March 2, 1993, for rehabilitation purposes.

Oil Spill Response Planning

To ensure the effectiveness of the National Oil Spill Contingency Plan, the membership of the National Committee on Oil Spill Control was regularly reviewed and the Plan itself updated on a regular basis to ensure availability of necessary information needed in the case of an emergency situation. Regional co-operation with Indonesia and Singapore under the Standard Operating Procedure (SOP) for Joint Oil Spill Combat in the Melaka and Johor Straits was an on-going exercise. An official level meeting on the Oil Spill Contingency Plan and Common Malaysia-Brunei Standard Operating

Procedure was held on October 1, 1993, in Kuala Lumpur and expected to be officially adopted in July 1994. As for ASEAN Co-operation, the ASEAN Oil Spill Response Action Plan (ASEAN-OSRAP) was established on May 20, 1993. In addition, the Government of Japan, through the Oil Spill Preparedness and Response Programme (OSPAR), had approved a budget totalling 200 million Yen for the establishment of an equipment stockpile base in Malaysia.

Dispersant Usage

In 1993, applications for approval for the use of six types of dispersants were received by the DOE. Two of them passed all the requirements for inclusion in DOE's Approved Dispersant Temporary List. The requirements for inclusion in the Approved Dispersant Temporary List is based on the existing Dispersant Usage Guideline. So far, 26 types of dispersants have been included in the Approval List.

Chapter 3

Pollution Abatement





CONTROL OF AGRO-BASED PRESCRIBED PREMISES

In 1993, a total of 277 crude palm oil (CPO) and 191 raw natural rubber (RNR) factories were licensed to comply with the standards of discharge specified under the Environmental Quality (Prescribed Premises) (Crude Palm Oil) Regulations 1977 (Amendment) 1982 and Environmental Quality (Prescribed Premises) (Raw Natural Rubber) Regulations 1978, respectively.

Figure 3.1 illustrates the growth trend for both CPO and RNR factories from 1978 to 1993. Both CPO and RNR factories showed an increase of more than 2 per cent compared to the previous year.

Through the enforcement visits conducted by DOE State Offices, the status of compliance for CPO and RNR factories in 1993 were found to be 62.1 per cent and 74.9 per cent respectively. Sixteen CPO factories and twelve RNR factories were taken to court for offences under the relevant environmental quality regulations and EQA 1974, as shown in Figures 3.2 and 3.3. Lack of adequate maintenance of their effluent treatment systems was the principal reason for the non-compliance cases. To this end, the DOE would be intensifying its enforcement activity and would focus on problematic sources. Steps have been taken to enhance accreditation among effluent testing laboratories under the national accreditation scheme known as *Skim Akreditasi Makmal Malaysia* (SAMM) to ensure uniformity and reliability of all the effluent testing reports submitted to DOE.

CONTROL OF NON- PRESCRIBED PREMISES

Status of Compliance with the Environmental Quality (Clean Air) Regulations 1978

Sawmill industries continued to pose problems with regard to solid wastes disposal in 1993. Many sawmills carried out open burning of wood wastes, in contravention of the Clean Air Regulations. DOE has always been promoting the reutilisation of wood wastes generated in the wood processing mill as fuel for kiln drying operations, steam boilers, brick manufacturing and charcoal making to prevent open burning activities. In addition, industries are encouraged to adopt the zero burning approach in waste management practices. For example, Golden Hope Plantations Berhad innovatively practised utilisation of trunks and branches of oil palm as natural organic fertilizer or soil conditioner in place of open burning.

Status of Compliance with the Environmental Quality (Sewage and Industrial Effluents) Regulations 1979

Lack of proper and efficient effluent treatment systems, particularly with respect to meet heavy metal, COD and BOD standards, were observed to be the main reasons for non-compliance, especially in the electroplating, oleochemical, rubber-based and textile industries. Figure 3.4 shows the status of compliance of manufacturing industries with respect to the Environmental Quality (Sewage and Industrial Effluents) Regulations 1979 for 1993 could not be

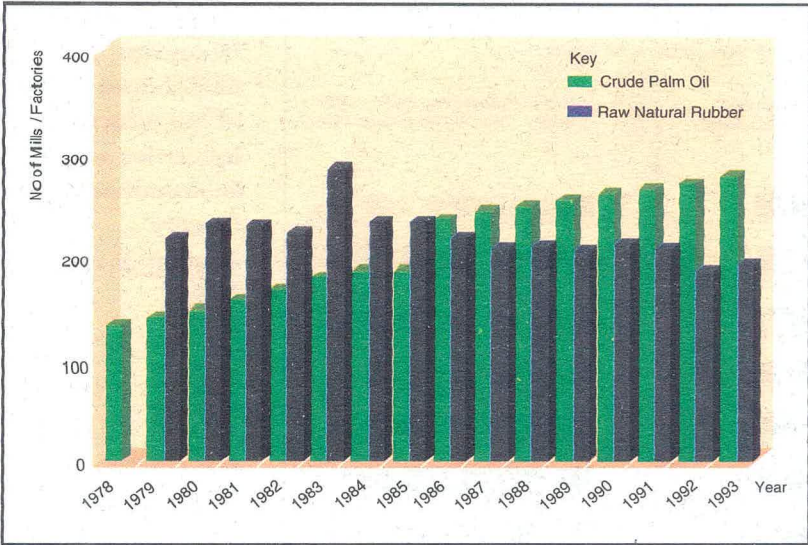


Figure 3.1
Malaysia: Total
Number of Crude
Palm Oil Mills
and Raw Natural
Rubber Factories,
1978-1993

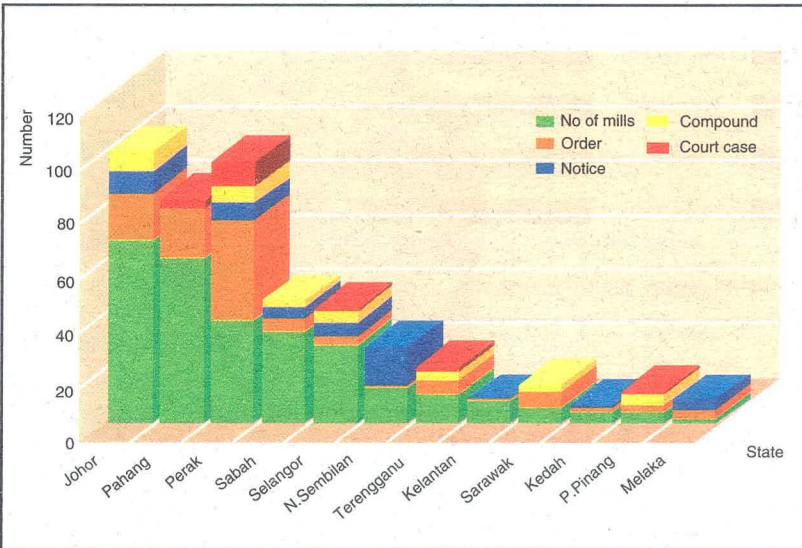


Figure 3.2
Malaysia:
Actions Against
Crude Palm Oil
Mills, 1993

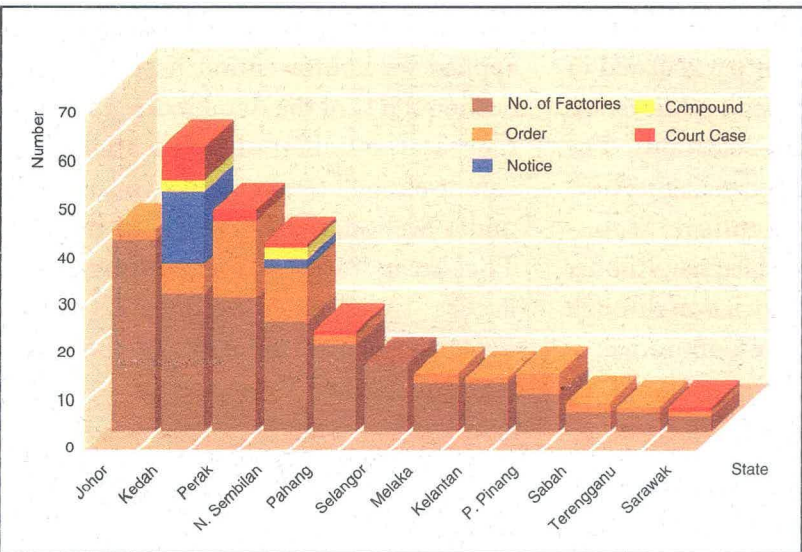
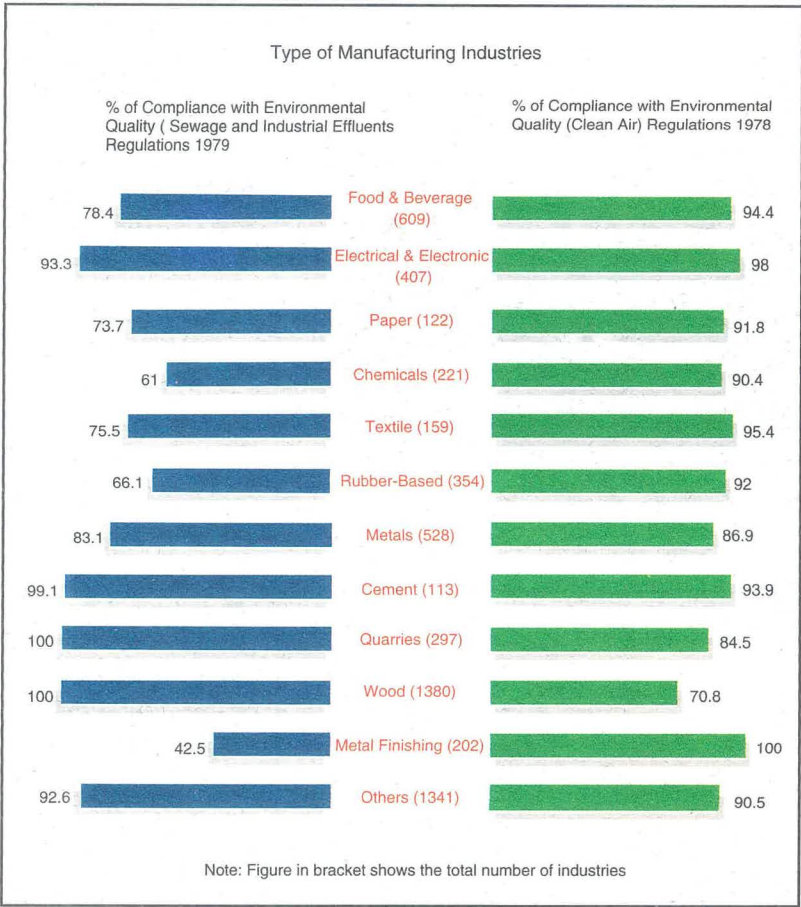


Figure 3.3
Malaysia:
Actions Against
Raw Natural
Rubber
Factories, 1993



■ **Figure 3.4**
Malaysia:
Compliance Status
of Manufacturing
Industries with
Environmental
Quality
Regulations,
1993

compared directly to the percentage of compliance for the previous year.

To facilitate compliance, a number of dialogue sessions between the Department of Environment and the industries concerned were conducted in 1993. Among the industries that participated in the dialogues were the food and beverage industry and the textile associations. The Department also conducted dialogues with the Malaysian Oleochemical Manufacturers Group and the Malaysian Rubber Glove Manufacturers Association through the Tripartite Consultative Committee.

Contravention Licence

The EQA 1974 allows for applications for licences to contravene acceptable condi-

tions as provided for under Section 22(1) and 25(1) of the Act. In 1993, a total of 75 licences for ceramic industries were given under Section 22(1) for excessive black smoke emissions. In addition, 15 chemical and 13 rubber-based industries applied for contravention licences under Section 25(1) of the Act. Figure 3.5 shows the total number of applications for contravention licences received since 1990, under Section 22(1) or 25(1) of the Act. The breakdown of the contravention licences issued under Sections 22(1) and 25(1) by type of industry are shown in Figures 3.6 and 3.7 respectively.

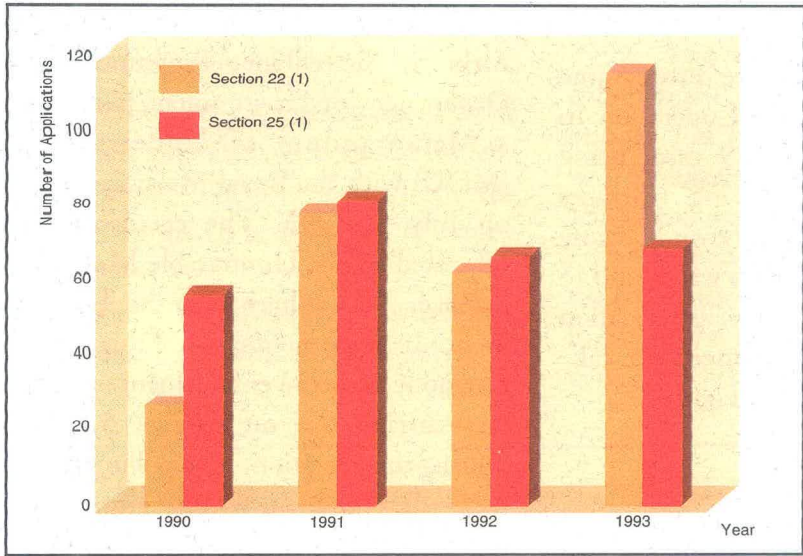


Figure 3.5
Malaysia:
Number of
Applications for
Contravention
Licences under
Sections 22 (1)
and 25 (1),
Environmental
Quality Act, 1974,
1990-1993

Department of Environment

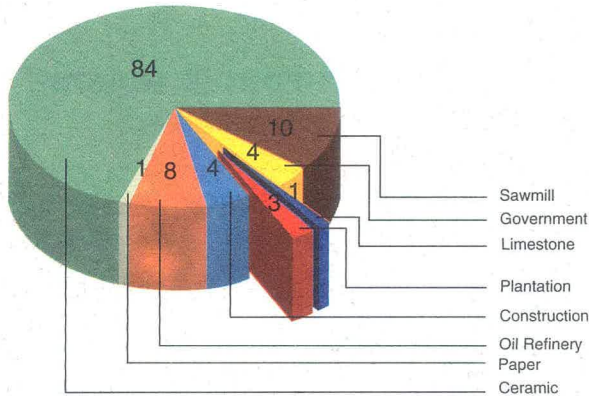


Figure 3.6
Malaysia:
Number of
Applications for
Contravention
Licences under
Section 22 (1),
Environmental
Quality Act,
1974, by Type of
Industry, 1993

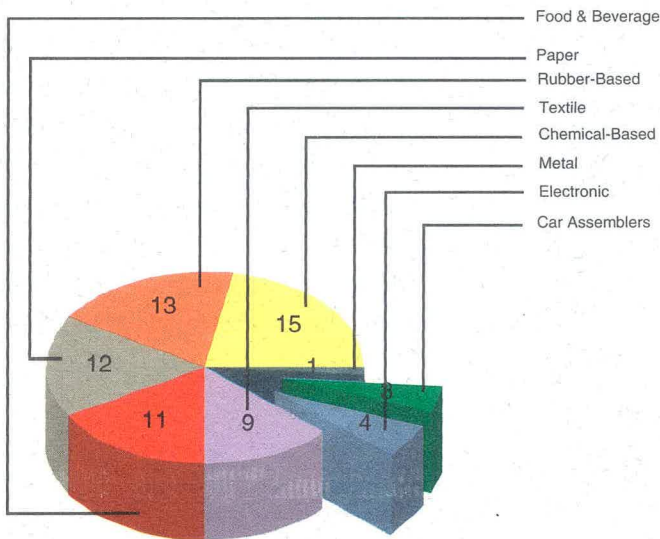


Figure 3.7
Malaysia:
Number of
Applications for
Contravention
Licences under
Section 25 (1),
Environmental
Quality Act,
1974, by Type of
Industry, 1993

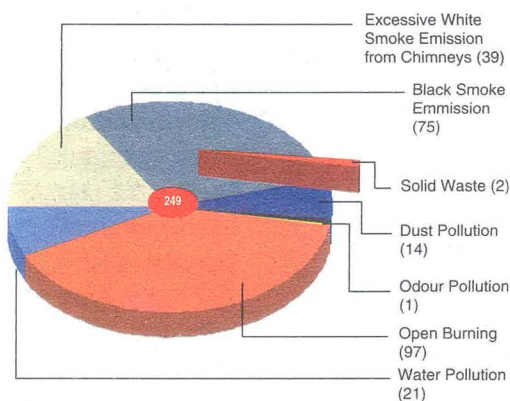


Airborne Surveillance

The Airborne Surveillance Programme entered its second year of operation in 1993, with a total of 249 cases being reported by the Police Air Wing. The types of complaints reported are shown in Figure 3.8, whereby open burning was found to be the main culprit. These information has enabled the Department to take enforcement actions as per Figure 3.9.

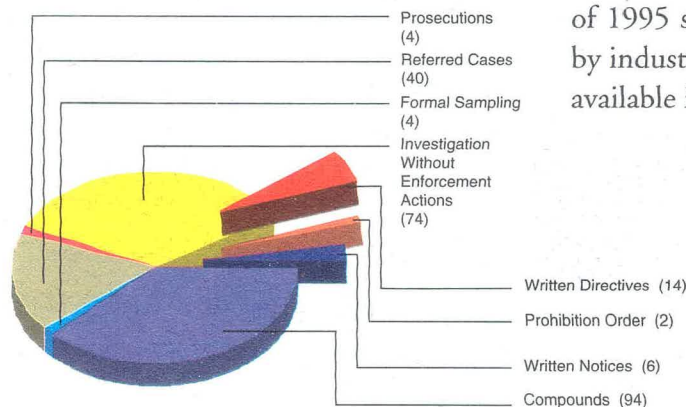
■ **Figure 3.8**

Malaysia: Distribution of Complaints Reported by Royal Malaysian Police (Air Wing), 1992-1993



■ **Figure 3.9**

Malaysia: Distribution of Enforcement Actions Taken from the Activity of Airborne Surveillance between the Department of Environment and the Royal Malaysian Police (Air Wing), 1993



In order to strengthen the existing Airborne Surveillance Programme, the Department of Environment had signed a Memorandum of Understanding (MOU) with the Royal Malaysian Police on July 8, 1993. The ceremony was officiated by the Honourable Minister of Science, Technology and the Environment. In conjunction with this signing ceremony, a special enforcement operation was carried out on August 5, 1993. During the operation, nine pollution cases were detected in which eight cases involved open burning activities. All the offenders were issued on-the-spot compounds by the DOE.

SCHEDULED WASTE MANAGEMENT

Establishment of Scheduled Waste Treatment and Disposal Facilities

The project on treatment and disposal facilities at Bukit Nanas, Negri Sembilan was approved by the Negri Sembilan State Government on December 29, 1993. The EIA report on the project was approved by DOE on August 26, 1993. The construction of the project is expected to start sometime mid-1994 and expected to be completed by the end of 1997. These facilities will be able to collect and store wastes from industries by the middle of 1995 so as to ease the problems faced by industries because of insufficient space available in their industrial premises.



Written Permission/Licence to Handle Scheduled Waste

In 1993, 60 licences for scheduled waste prescribed premises were issued by the Department. The break-down of the facilities approved is as shown in Figure 3.10.

The number of applications received for handling of scheduled wastes increased

about two folds in 1993, compared to 1992. The increase was due to the enforcement of the Custom Orders for import and export of scheduled wastes which came into effect on August 11, 1993, and also due to public awareness on waste management. Figure 3.11 shows the comparison in the number of applications for handling of scheduled wastes between 1991-1993.

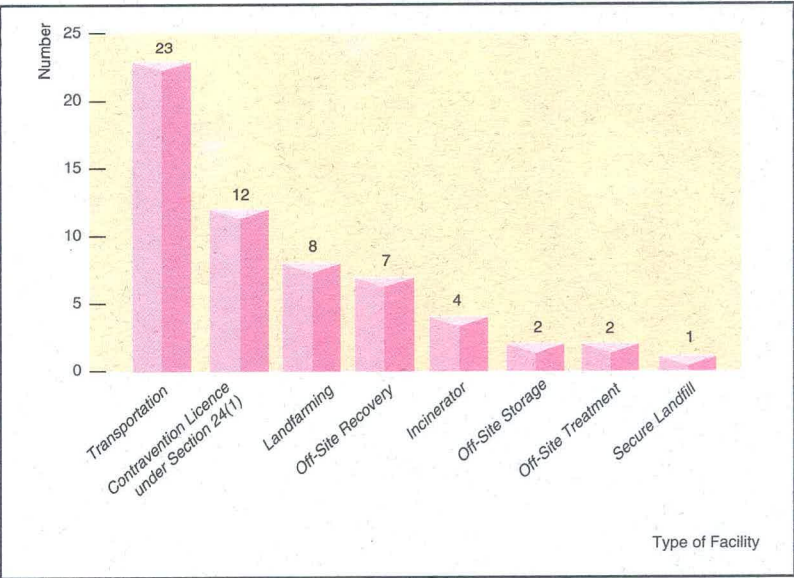


Figure 3.10
Malaysia:
Approved Facilities
for Scheduled
Wastes Manage-
ment, 1993

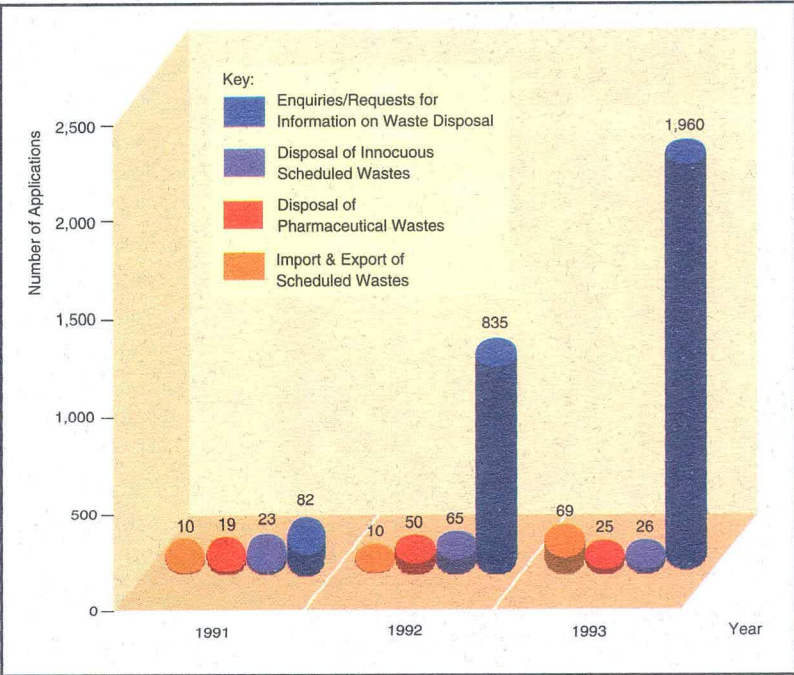


Figure 3.11
Malaysia:
Applications for
Handling Sched-
uled Waste Other
Than Prescribed
Premises. Number
by Type of
Applications,
1991-1993



**Indiscriminate
dumping of toxic
wastes
containers**



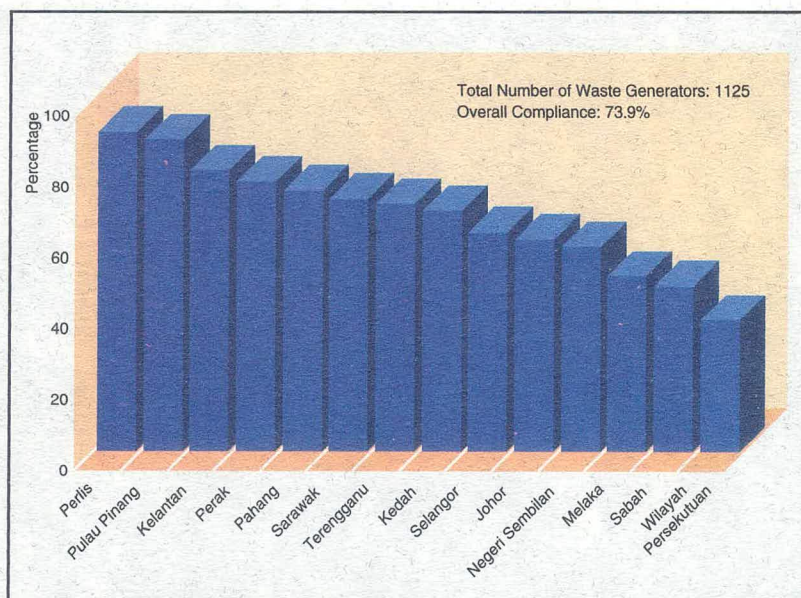
**A typical aerial
shot taken during
the DOE-Royal
Malaysian Police
(Air Wing)
airborne
surveillance**



**Smoke Test carried
out during an
enforcement
campaign**







■ **Figure 3.12**
Malaysia: Status
of Compliance to
Notification of
Scheduled
Waste, by State,
1993

The number of notification of waste generation to the DOE also increased in 1993. Figure 3.12 shows the status of compliance at the state level.

Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal

The Basel Convention, a worldwide agreement on limiting international trade in toxic and hazardous wastes, came into force on May 20, 1992. The Convention's goal is to reduce international movements of hazardous waste to a minimum, to reduce hazardous waste generation, and to promote self-sufficiency in hazardous waste disposal, consistent with environmentally sound management. The Convention controls transboundary movements of hazardous waste through a system of prior notification and written consent. Forty-seven categories of ecotoxic, toxic, explosive, flammable, infectious or corrosive wastes have been included in the control procedure.

In order to enforce the requirements of the Convention in Malaysia, a new set of control procedure under the Customs Act 1967 was enacted. The Customs (Prohibition of Exports) (Amendment) (No. 2) Order 1993 and the Customs (Prohibition of Imports) (Amendment) (No. 3) Order 1993 were enforced on August 12, 1993. These Orders, enforced together by the Royal Customs and Excise Department and the DOE, specify that any export or import of toxic and hazardous wastes out of or into Malaysia must obtain prior written consent from the Director-General of Environmental Quality.

Following the enforcement of the above export and import control regulations, Malaysia deposited its instrument of accession to the Basel Convention on October 8, 1993. Thus, the Convention would come into force for Malaysia 90 days later, which is on January 6, 1994.

In 1993, Malaysia participated in the following meetings organised by the Secretariat of the Basel Convention:



- (a) Fifth Session of the Technical Working Group to prepare Technical Guidelines for the Environmentally Sound Management of Wastes Subject to the Basel Convention, Geneva, September 1-3, 1993; and
- (b) First Meeting of the *Ad-Hoc* Committee for the Implementation of the Basel Convention, Geneva, October 26-28, 1993.

In addition, a bilateral arrangement with Singapore on the transboundary movements of certain types of scheduled wastes was agreed upon during the Fifth Meeting of the Malaysia-Singapore Joint Committee on the Environment, held in Singapore in April 1993. Both countries agreed that a "one-off" notification procedure is required for the import or export of certain wastes destined for recovery or reuse in both countries. These wastes are: solder dross, spent ammonia etchant, spent ferric chloride etchant, spent sulphuric acid, spent organic and non-halogenated solvents, spent lubricating and hydraulic oils and copper slag. A similar procedure has been initiated at the request of Australia since the end of 1993.

CONTROL OF MOBILE SOURCES

Black Smoke Emissions

In 1993, the Department of Environment with the co-operation of the Traffic Police conducted 276 enforcement campaigns throughout the country. A total of 34,045 vehicles were tested, out of which 6,458 summonses were issued for excessive

smoke. Figure 3.13 shows the enforcement statistics between 1989-1993, the percentage of compliance for 1993 being 81 per cent. Figure 3.14 shows compliance percentage by vehicle type. The statistics at the State level is given in Figure 3.15.

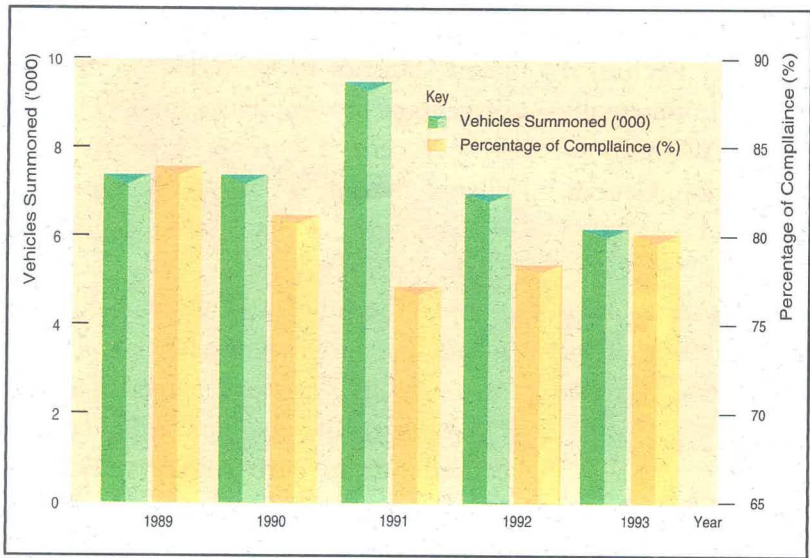
In November and December 1993, special operations with the co-operation of the DOE Selangor/ Federal Territory State Office and the Traffic Police were carried out to curb smoky vehicles in Kuala Lumpur City Centre. A total of 260 vehicles were summoned out of 2,737 tested during the operations.

Study on Emission from Mobile Sources in Klang Valley.

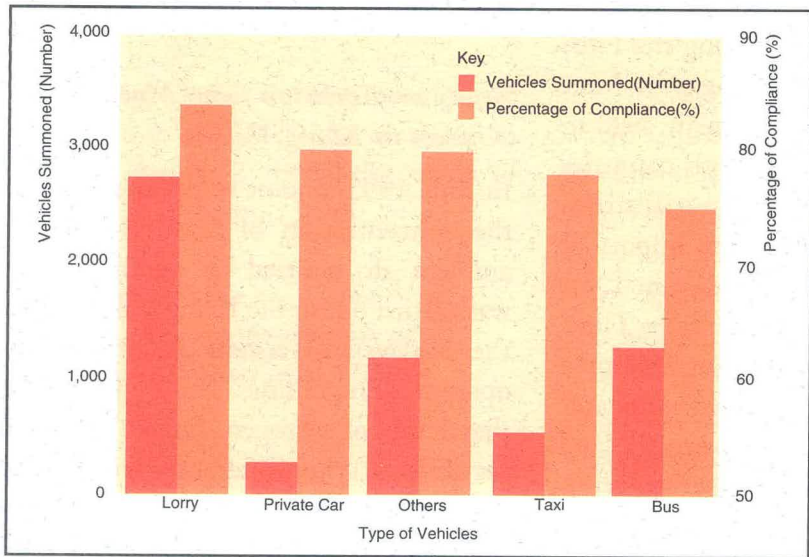
In June 1993, a joint study to determine the concentration of harmful gases in ambient air, emitted by motor vehicles was carried out in the Klang Valley under the Malaysian-German Technical Co-operation Programme. The study showed that levels of nitrogen dioxide in many sections of the inner city roads had exceeded the WHO standard/ recommendation.

Dialogue with Motor Vehicle Assemblers and Traders

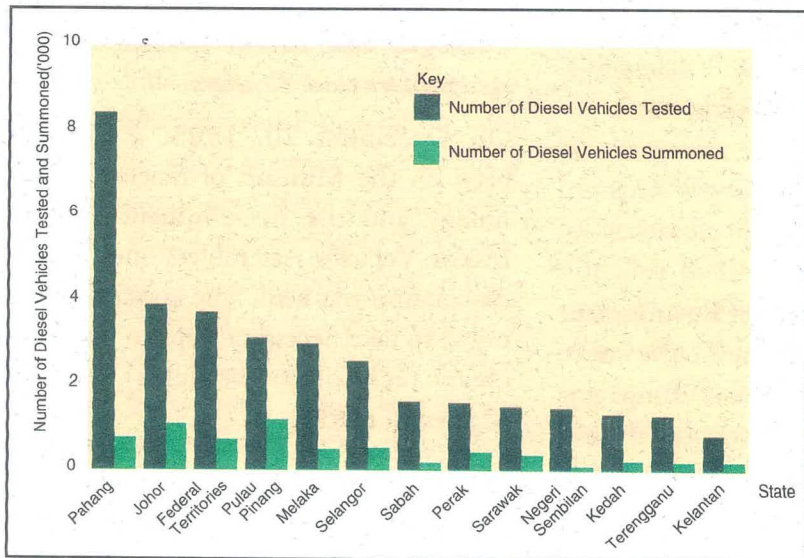
On December 20, 1993, a dialogue between the Minister of Science, Technology and the Environment and the Motor Vehicles Assemblers and Traders Association was held. The association was urged to take necessary steps to introduce clean technology vehicles into the Malaysian market.



■ **Figure 3.13**
Malaysia: Enforcement of Motor Vehicles (Control of Smoke and Gas Emission) Rules 1977. Vehicles Summoned and Percentage of Compliance, 1989-1993



■ **Figure 3.14**
Malaysia: Enforcement of Motor Vehicles (Control of Smoke and Gas Emission) Rules 1977. Vehicles Summoned and Percentage of Compliance According to Type of Vehicles, 1993



■ **Figure 3.15**
Malaysia: Diesel Powered Vehicles Inspected and Summoned for Excessive Smoke Emission by State, 1993

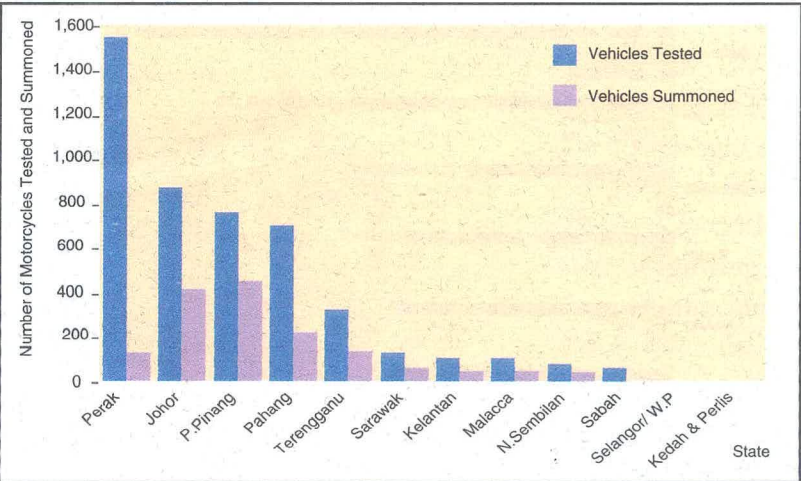
Lead in Motor Gasoline

Since January 1, 1990, all oil companies in Malaysia have complied with the current lead level of 0.15 g/l. In 1993, 120 samples taken from petrol kiosks met the standard stipulated.

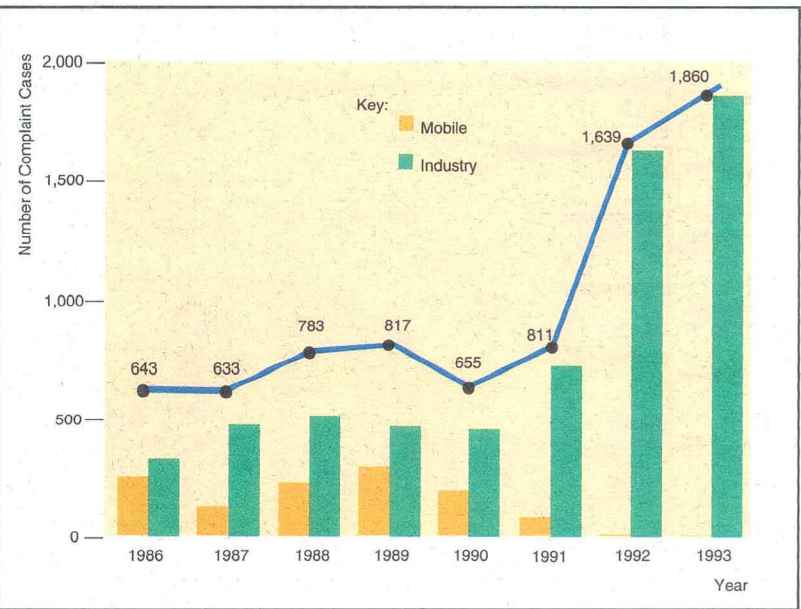
The retail sale of lead-free gasoline for 1993 was 31.3% of the total sale of gasoline in Malaysia. A three-cent price difference between unleaded and leaded gasoline is expected to be introduced on January 1, 1994. It is thus, anticipated that the use of unleaded gasoline will be increased in 1994.

Motor Vehicle Noise

Throughout the year, 115 enforcement campaigns were carried out by the DOE State Offices under the Environmental Quality (Motor Vehicle Noise) Regulations 1987. Out of 4,691 motorcycles tested, 1562 were summoned for violating the permissible limits. Figure 3.16 shows the number of vehicles tested and summoned in every State in Malaysia.



■ **Figure 3.16**
Malaysia:
Environmental
Quality (Motor
Vehicle Noise)
Regulations
1987. Vehicles
Tested and
Summoned,
1993



■ **Figure 3.17**
Malaysia: Trend
in the Number of
Complaint Cases
Received by the
Department of
Environment,
1986-1993



PUBLIC COMPLAINTS

In 1993, the Department of Environment received 1,860 complaints of environmental problems from the public — an increase of 13 per cent from the previous year. The yearly trend of complaints since 1986 is illustrated in Figure 3.17.

The State of Selangor recorded the highest number of complaints with 16 per cent of the total, followed by Perak, 13 per cent. The least number of com-

plaints were received from Perlis, 1 per cent; followed by Kelantan, 3 per cent. Figure 3.18 illustrates the distribution of complaints throughout the country. It is evident that air pollution was the major problem, contributing 69 per cent of the complaint cases; followed by water pollution, 14 per cent. Figure 3.18 also indicates that air pollution problems exceeded other complaints in every state. Figure 3.19 illustrates the nature of complaints received by the Department of Environment in 1993.

■ **Figure 3.18**
Malaysia: Nature
of Pollution
Complaints by
State, 1993

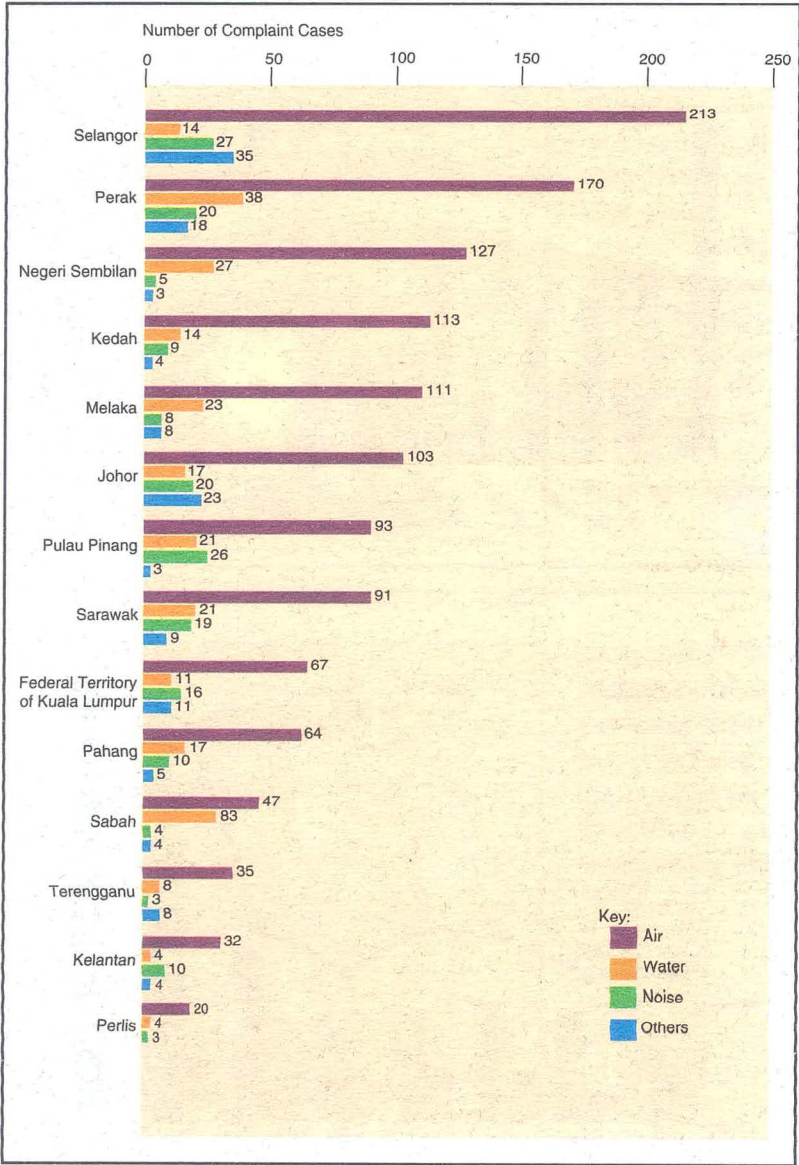




Figure 3.19
Nature of Complaints Received by the Department of Environment, 1993

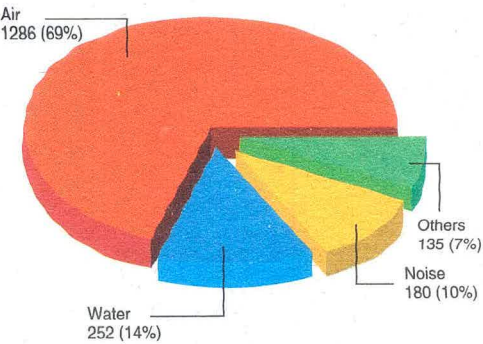


Figure 3.20
Malaysia: Sources of Air Pollution Complaints, 1993

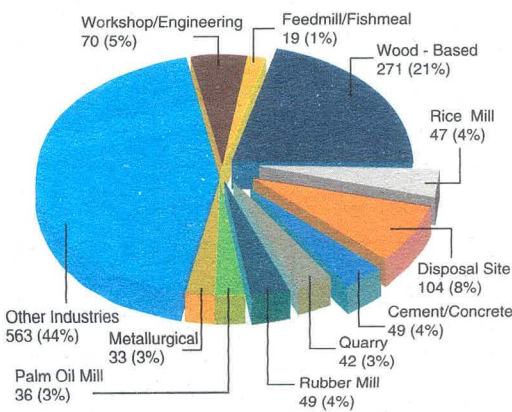
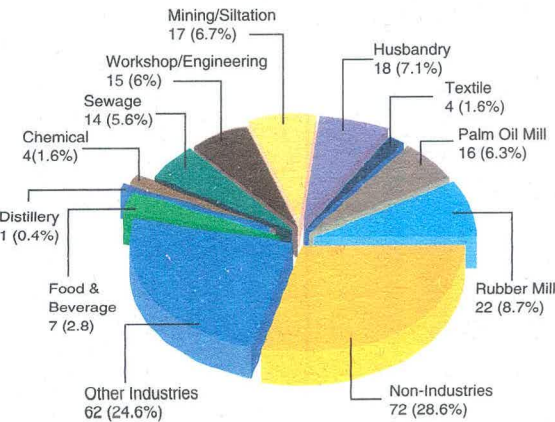


Figure 3.21
Malaysia: Sources of Water Pollution Complaints, 1993



The highest number of air pollution complaints arose from industrial sources (non-specific), numbering 512 out of 1092 accounting for 47 per cent; followed by wood-based sources, 21 per cent, as illustrated in Figure 3.20.

Conversely, non-industrial sources contributed the highest number of water pollution complaints with 29 per cent; followed by other industries, 25 per cent. Figure 3.21 shows the sources of water pollution complaints in 1993.

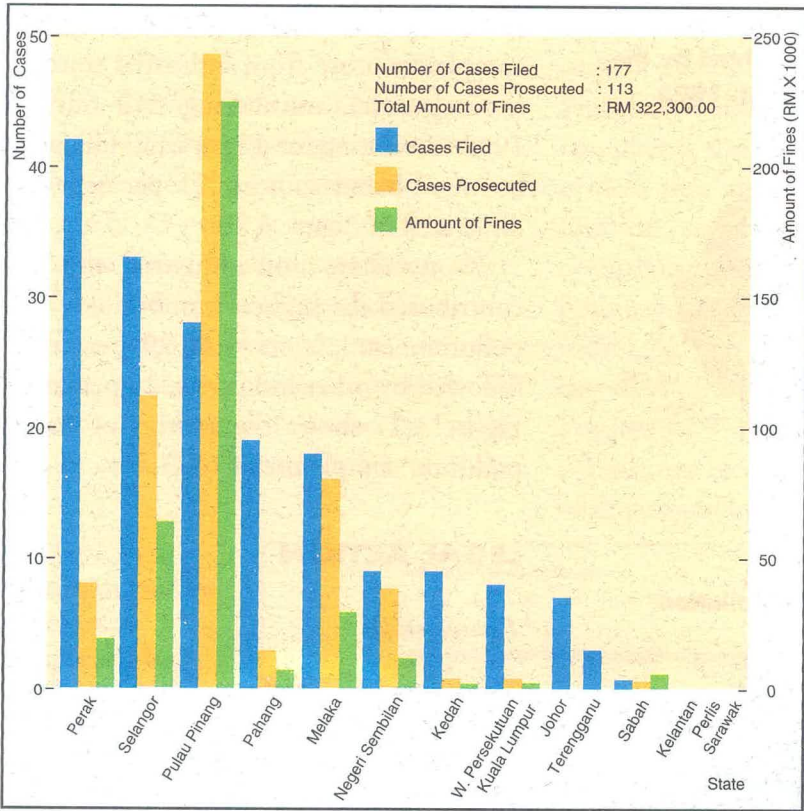
LEGAL ACTION

Prosecution

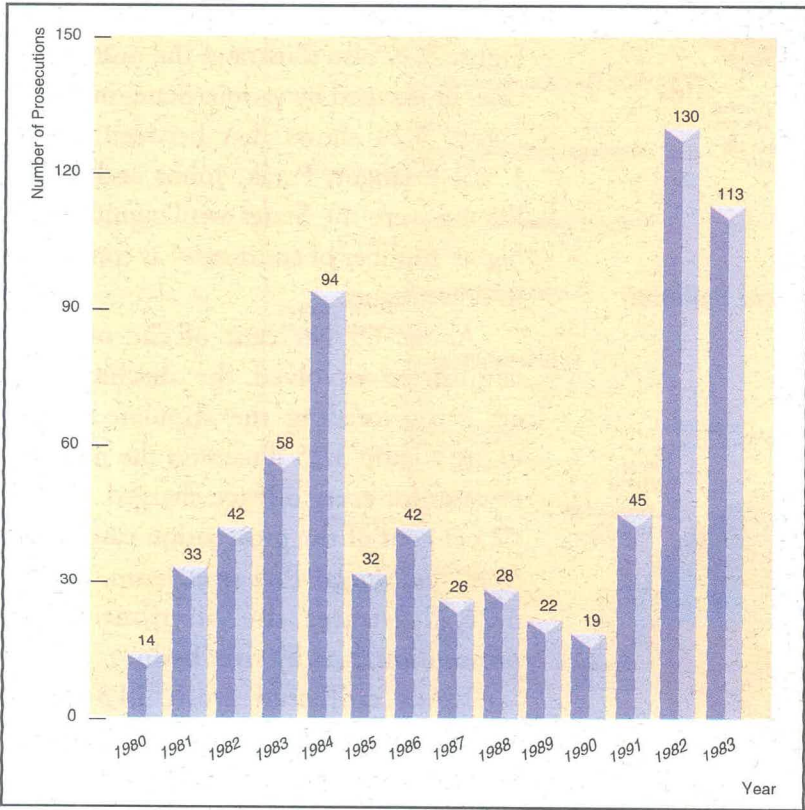
There were 177 new cases filed in court in 1993 as per Figure 3.22. Cases filed in Perak, Selangor and Pulau Pinang formed 58 per cent of the offences charged. In 1993, only 113 prosecution cases were settled, showing a decrease of 13 per cent from the previous year as per Figure 3.23. Figure 3.22 also illustrates the number of cases prosecuted by various States in 1993. Figure 3.24 shows that between 1980-1993, Selangor, Perak, Johor and Pulau Pinang were the States with significantly higher number of court cases as compared to other States.

About 69 per cent of the offences committed involved the discharge of effluent exceeding the stipulated standards. Figure 3.25 illustrates the number of cases for every offence charged. About 42 per cent of the prosecution cases were from the Sungai Prai river basin. Figure 3.26 illustrates the distribution of prosecution cases by river basin.

Fines collected from 113 cases amounted to RM322,300 showing an increase of 116 per cent over the previous



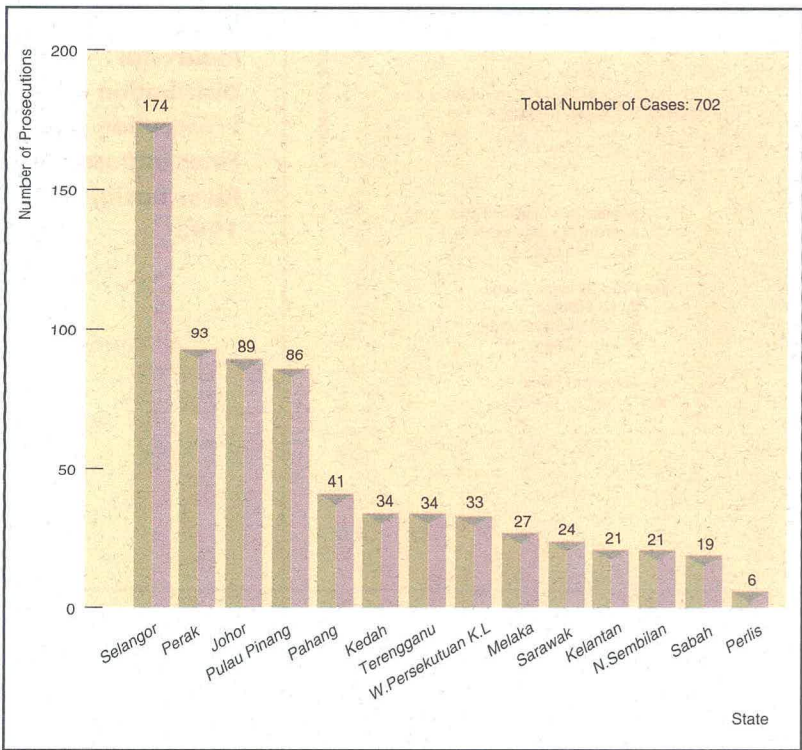
■ **Figure 3.22**
**Malaysia: Pro-
secution Cases
Filed, Prosecuted
and Fines Imposed
by State in 1993**



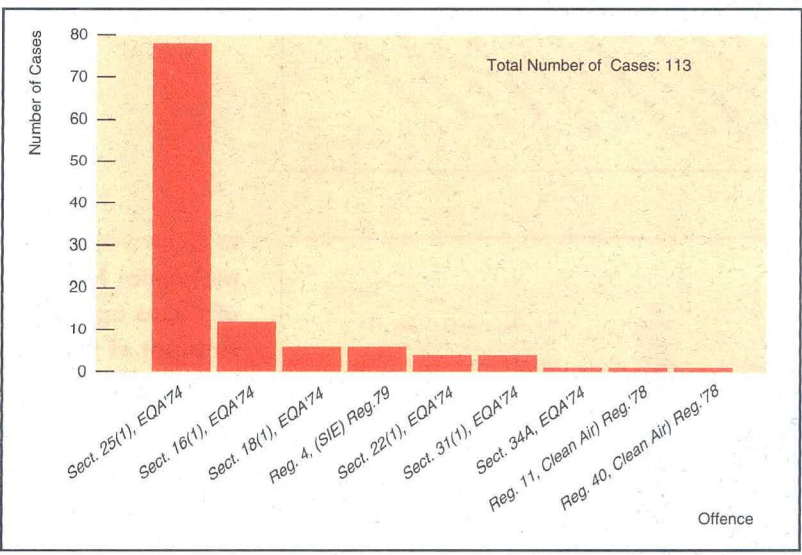
■ **Figure 3.23**
**Malaysia: Offences
Prosecuted under
the Environmental
Quality Act, 1974
and Regulations
Made Thereunder.
Number by Year,
1980-1993**



■ **Figure 3.24**
Malaysia: Offences Prosecuted under the Environmental Quality Act, 1974 and Regulations Made Thereunder. Number by State, 1980-1993

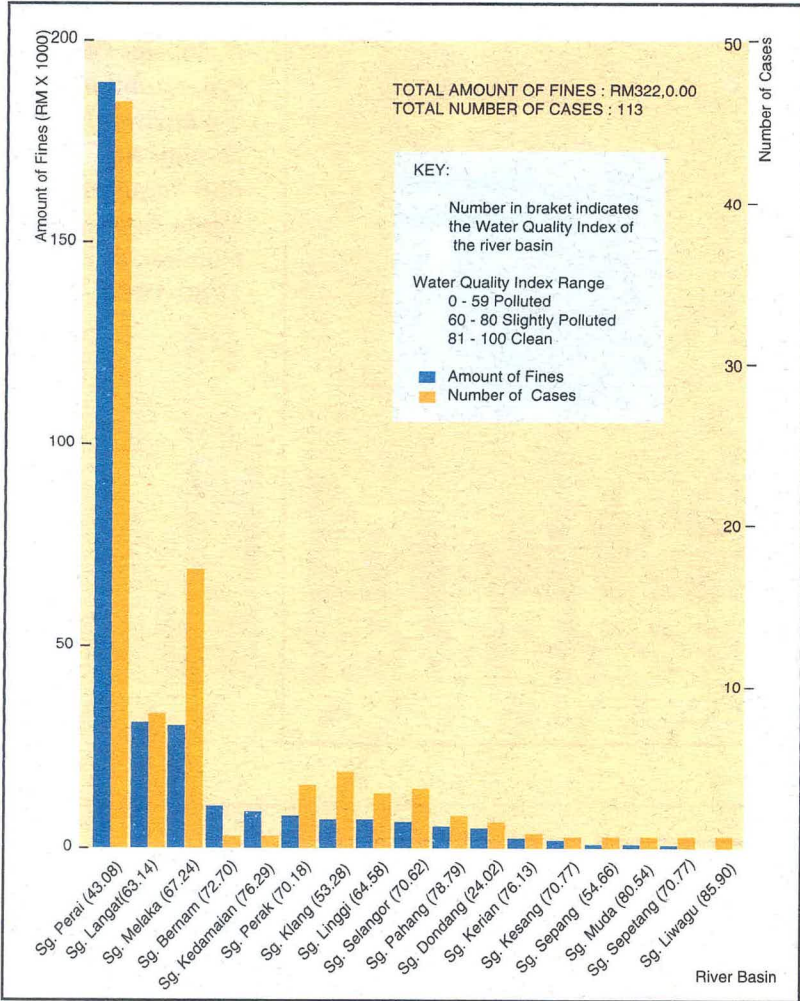


■ **Figure 3.25**
Malaysia: Number of Cases by Type of Offences, 1993

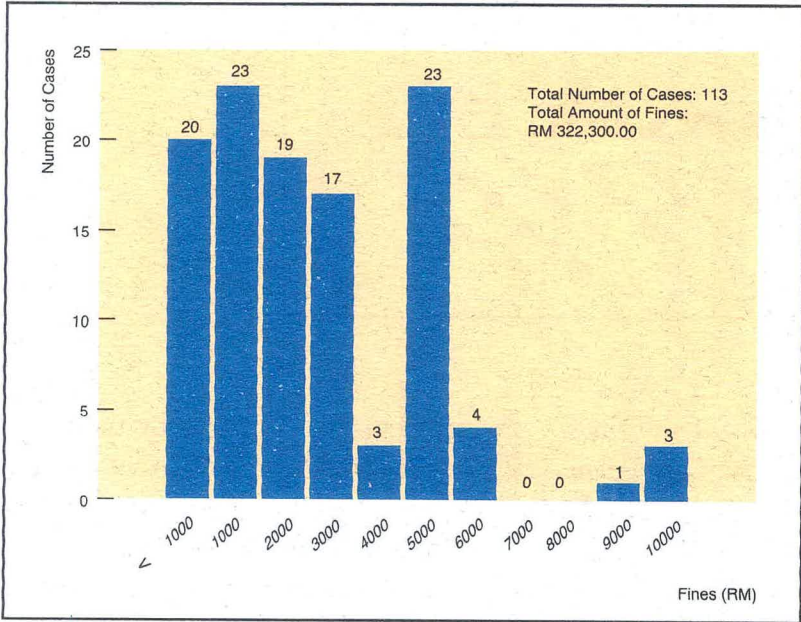


year, of which 60 per cent of the fines were collected from the State of Pulau Pinang as illustrated in Figure 3.22. Only 3 cases found guilty were given a maximum fine of RM10,000.00 — 2 in Pulau Pinang and 1 in Selangor. The

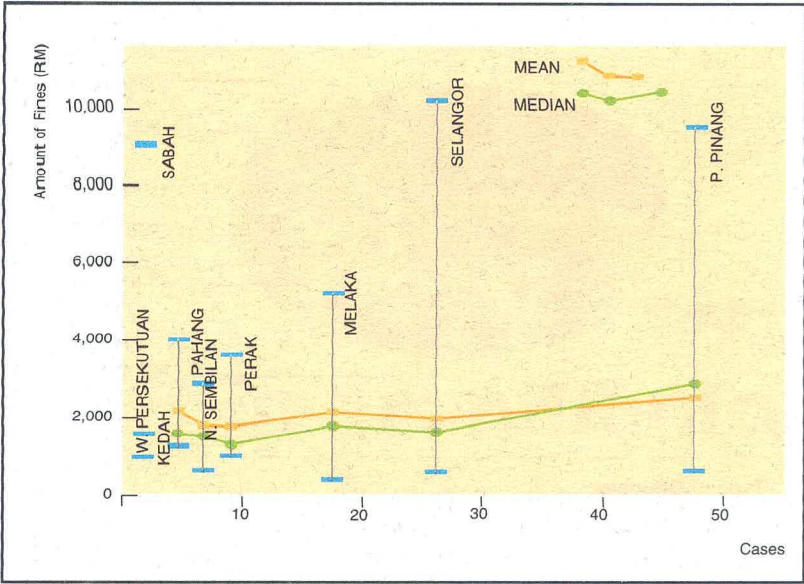
frequency of fines imposed by the court is illustrated in Figure 3.27. Out of this, 20 cases were fined less than RM1,000.00. The minimum, maximum, mean and median of fines imposed by the court is illustrated in Figure 3.28.



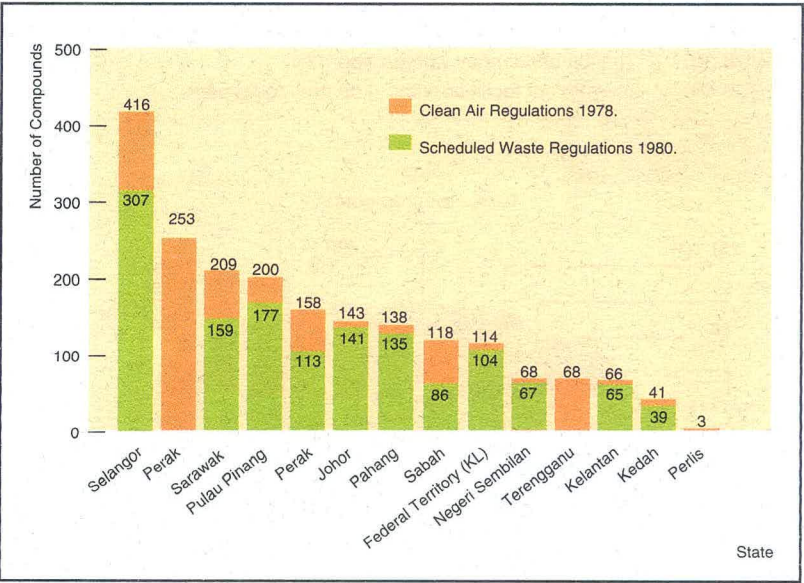
■ **Figure 3.26**
Malaysia:
Distribution of
Prosecution and
Fines Imposed by
River Basin,
1993



■ **Figure 3.27**
Malaysia: Number
of Cases against
Amount of Fines
Imposed, 1993



■ **Figure 3.28**
Malaysia: Extent of Fines Imposed against Number of Cases Filed by State, 1993



■ **Figure 3.29**
Malaysia: Number of Compounds Issued by State and Type of Offence, 1993

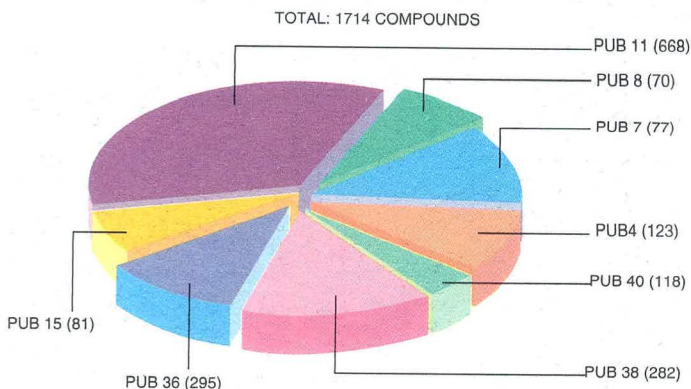
COMPOUNDS

In 1993, a total of 1,995 compounds were issued and RM751,610 of fines were collected, an increase of 30 per cent and 28 per cent in compounds and fines, respectively, as compared to 1992. From the total, 86 per cent of the compound cases involved offences contravening the Environmental Quality (Clean Air)

Regulations 1978 as per Figure 3.29 and the remaining 14 per cent for offences under the Environmental Quality (Scheduled Wastes) Regulations, 1989. Figures 3.30 and 3.31 illustrate the breakdown of cases compounded under the Environmental Quality (Clean Air) Regulations 1978 and the Environmental Quality (Scheduled Wastes) Regulations 1989, respectively.



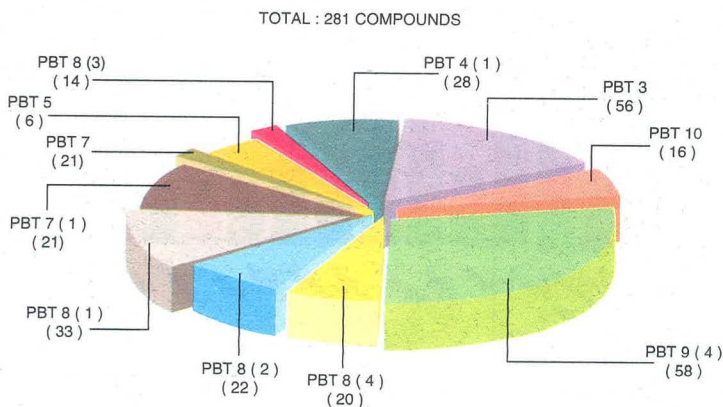
■ **Figure 3.30**
Malaysia: Offences
Compounded under
the Environmental
Quality (Clean Air)
Regulations 1978.
Number by Type,
1993



Type of Offences:

- PUB 4 : New installations as described in the first schedule (Installations without approval)
- PUB 7 : Using incinerator not of approved design
- PUB 11 : Open burning of wastes
- PUB 15 : Emission of dark smoke
- PUB 36 : Installation of fuel burning equipment without approval
- PUB 38 : Erection of chimney without approval
- PUB 40 : Operation of facilities without control equipment

■ **Figure 3.31**
Malaysia: Offences
Compounded under
the Environmental
Quality (Scheduled
Wastes) Regulations
1989. Number by
Type, 1993



Type of Offences:

- PBT 3 : Failure to notify the generation of wastes
- PBT 4(1) : Scheduled wastes not disposed of at prescribed premises
- PBT 4(2) : Scheduled wastes not rendered innocuous prior to disposal
- PBT 5 : Scheduled wastes not treated at prescribed premises
- PBT 7 : Scheduled wastes not properly stored, treated on-site or delivered and received at prescribed premises
- PBT 8(1) : Failure to ensure proper storage of scheduled wastes
- PBT 8(2) : Failure to label scheduled waste containers
- PBT 8(3) : Scheduled wastes not stored in separate containers
- PBT 8(4) : Area and storage of containers not designed, constructed and maintained adequately
- PBT 9 : Failure to keep an inventory of scheduled wastes
- PBT 10 : Failure to submit information in accordance to the sixth schedule

Chapter 4

Environmental Assessment





OVERVIEW

The year 1993 turned out to be another busy and productive year for activities related to EIA, Geographic Information System (GIS) and inputs to landuse planning, especially with the problems of erosion and sedimentation as a result of poorly planned development and lack of mitigation measures in upper catchment areas.

Measures to enhance EIA were carried out and concerted efforts were made to reduce the time taken to process EIA reports. January 1993 saw the decentralisation of the EIA reports processing to the DOE State Offices of Penang, Perak, Selangor and Federal Territory of Kuala Lumpur, Johor and Sarawak. Other changes were also effected and by end of the year, the time taken was reduced substantially from the peak of 6.2 months in 1991 to 2.9 months.

Work began on the drafting of specific guidelines for the prescribed activities of coastal resort development, petrochemical industry, industrial estates and golf course development. The Department continued to consult relevant agencies, including consultants and professional organisations to develop criteria for the registration of EIA consultants.

To support the privatisation of the National Sewerage Services, DOE was actively involved in the formulation of the Sewerage Services Act, 1993, and the conceptualisation of the project. During the negotiations, the DOE provided inputs to ensure that environmental factors were taken into account in the taking over of the existing treatment plants and the construction of new ones by the consortium.

Within the first year of the establishment of the GIS, the Unit was able to produce outputs to support decision making for management of natural resources and landuse planning.

EIA NOTIFICATION AND REVIEW

The Department continued to register projects subject to EIA on being notified by the proponents or through reports and announcements in the mass media, despite the absence of requirement for notification. In 1993, a total of 244 proposed projects subject to EIA were monitored compared to 153 in 1992. Among these the highest number were related to resorts and recreational development (18 per cent), followed by quarry (17.6 per cent), housing (16.8 per cent), and both infrastructure and waste treatment accounted for 12.3 per cent. In contrast, quarrying and infrastructure projects had each accounted for 14 per cent of the projects identified in 1992.

The number of EIA reports submitted to the DOE in 1993 increased by 37 per cent over 1992 and 24 times over 1988 as shown in Figure 4.1. Out of 268 reports received, 256 are preliminary EIA reports; one a detailed EIA report and 11 risk analyses associated with hazardous installations. The detailed EIA report was prepared for the Kuala Lumpur International Airport, Sepang in Selangor Darul Ehsan, and was reviewed by an *ad hoc* review panel appointed by the Director-General of Environmental Quality. Between April 1, 1988 and December 31, 1993, the number of EIA reports submitted to the Department totalled 797 reports, of which 738 (93

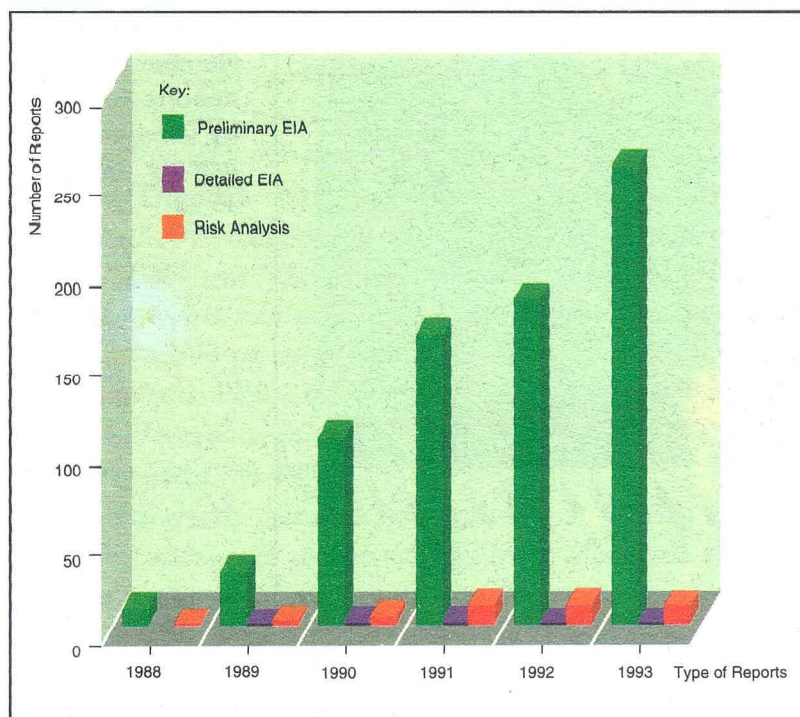


Figure 4.1
Types of EIA
Reports Received,
1988-1993

per cent) comprise preliminary EIAs, 44 (5 per cent) risk analyses, seven detailed EIA reports (0.9 per cent) and the remaining eight are reports of studies carried out on development proposals in the Exclusive Economic Zone.

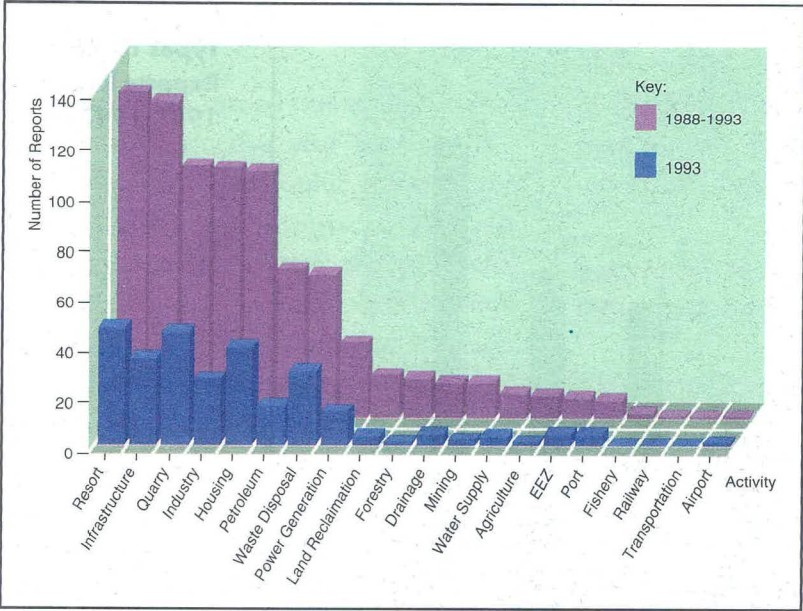
PRESCRIBED ACTIVITIES AND PROJECT CATEGORISATION

To date, the highest number of reports submitted since the enforcement of the EIA Order 1987, were for resorts and recreational development, as well as quarry, accounting for 16 per cent of the total, followed by infrastructure-related development (15 per cent) and housing (11 per cent). It is interesting to note that the number of reports related to quarry activity had risen considerably while industry had remained steady over the years. However, no reports were submitted for major transportation development such as railway while for

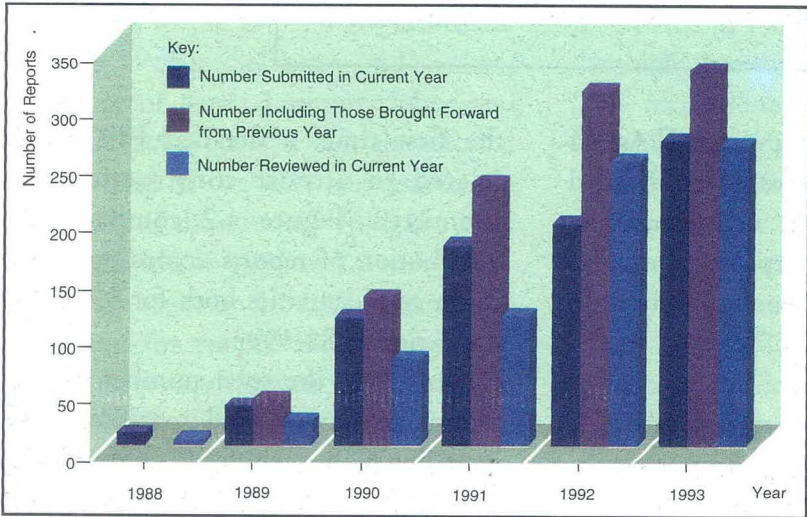
the first time, a detailed EIA report related to airport construction was submitted. Figure 4.2 compares the distribution of reports according to the category of activities both for 1993 and the period 1988-1993.

In 1993, the total number of EIA reports to be reviewed soared to 330, including 62 brought forward from 1992. By December 31, 1993, a total of 264 reports (80 per cent) had been successfully reviewed. The remainder were either still being reviewed or decision deferred pending the submission of supplementary information.

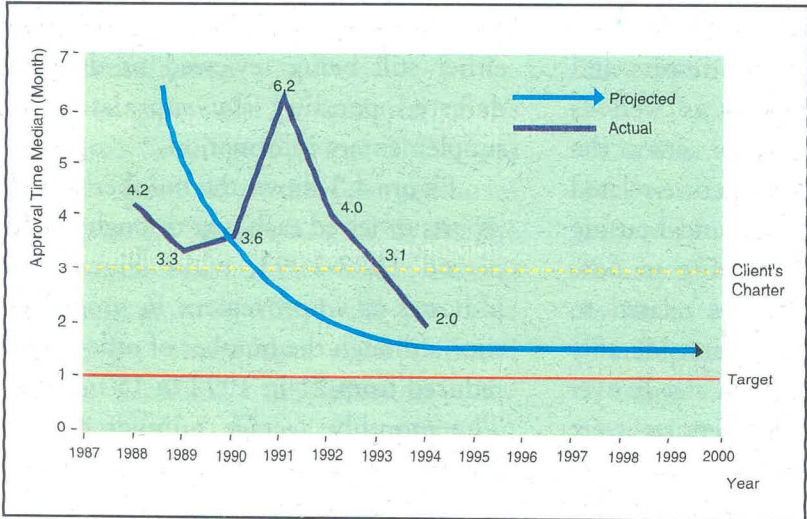
Figure 4.3 shows the number of EIA reports reviewed each year throughout the period 1988-1993, while Figure 4.4 indicates an improvement in processing time although the number of officers had reduced from 21 in 1992 to 15 in 1993. The monthly average number of EIA reports reviewed was maintained at 22 in 1993 compared to 21 in 1992.



■ **Figure 4.2**
Number of EIA Reports Received by Category of Activity, 1988-1993



■ **Figure 4.3**
Number of EIA Reports Submitted and Reviewed, 1988-1993



■ **Figure 4.4**
Time Taken for EIA Reports Approval



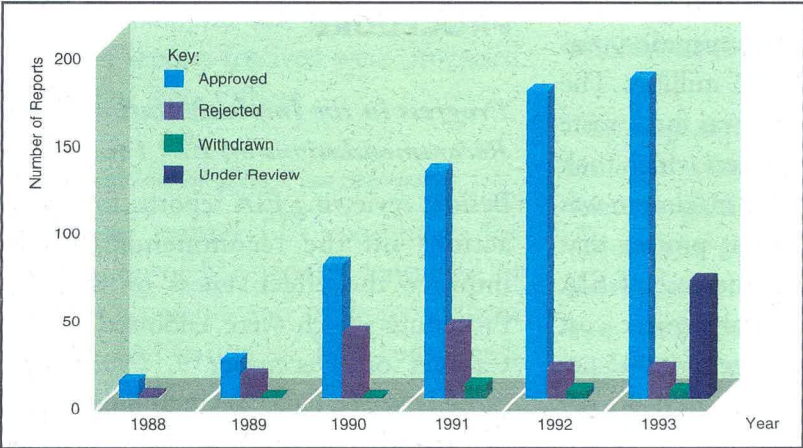
Of the 268 reports received in 1993, 179 reports were approved, 18 rejected, 5 withdrawn by the project proponent and the remaining 66 reports brought forward to 1994. Thus, by end of the year the number of EIA reports approved since April 1, 1988 was 531 reports (67 per cent), 222 reports (28 per cent) rejected, and 16 reports (3 per cent) withdrawn by the proponents. Figure 4.5 compares the status of EIA reports processed annually, over the period 1988-1993.

Analysis of the distribution of EIA reports by states over the period of EIA implementation indicates a similar trend to 1992, with Selangor and Johor far outnumbering the other states, accounting for 41 per cent of the total number of

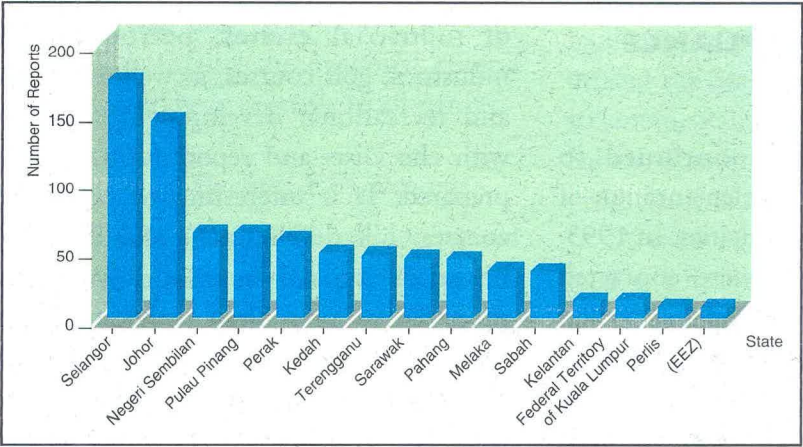
reports submitted. Perlis is the state with the least number of reports (9) followed by Kelantan and Federal Teritorries (Kuala Lumpur and Labuan) with 13 reports each. Other states each contribute between 34 to 62 reports. Figure 4.6 illustrates the distribution of EIA reports in the states for the period 1988-1993.

ISSUES RELATED TO EIA IMPLEMENTATION

In 1993, a survey carried out by the DOE identified that majority of the reports submitted required additional information from project proponents or their consultants. The time taken for additional information to be submitted ranged from



■ Figure 4.5
Number of EIA Reports Processed, 1988-1993



■ Figure 4.6
Distribution of EIA Reports Received, by State, 1988-1993



a minimum of seven days to a maximum of 3 months.

The additional information needed include:

- sewage and industrial effluent treatment facilities, discharge outlets and impacts to the environment;
- project layout plans;
- description of landuse;
- information on soil erosion control and impacts to the environment; and
- description of project concept, process and activities.

PREPARATION OF EIA REPORTS: TIME & COSTS

The Department has continued to monitor the costs and duration of EIA preparation. Over the period 1988 to 1993, the costs of EIA preparation was between RM2,000 - RM3 million. The minimum cost for an EIA was for a waste treatment and disposal project which took one man-month, whilst the maximum was for an airport development project that took 387 man-months. The cost of EIA in comparison to the total project cost was found to be in the range of 0.001 per cent (a recreational project) to 1.96 per cent (a quarry project).

IMPACT AND COMPLIANCE MONITORING

The Department has continued to monitor the status of implementation of approved development activities. In 1993, 94 project proponents were contacted regarding their status of implementation with 60 per cent responding. Of the 56 respondents, the majority (46 per cent) were at various stages of construction, or

were carrying out earthworks, 34 per cent at design stage, with the remaining 20 per cent either completed or in operation.

In 1993, 15 project sites were visited. As a result of the visits, 11 notices were issued to project proponents for failure to comply fully with the required conditions.

For the first time a quarry operator in Sabah and a resort developer in Negri Sembilan were taken to court for offences committed under section 34A of the Environmental Quality Act, 1974. Each of them were fined RM9,000 and RM5,000 respectively for commencing construction prior to obtaining approval from the Director-General of Environmental Quality.

ENHANCEMENT OF EIA PROCEDURE

Progress in the Implementation of the Recommendations on EIA Procedure.

Besides reviewing EIA reports, follow-up actions on the recommendations to improve the effectiveness of the EIA Procedure which were endorsed by the Cabinet on December 9, 1992, were carried out. To date, five draft final reports on specific guidelines for housing, infrastructure related to the establishment of industrial estates, petrochemical industries, golf courses, as well as resorts and recreational development together with checklists and report formats were prepared. It is interesting to note golf courses, hill development and development on sensitive areas have been proposed as prescribed activities to be included in the EIA Order 1987. As for the remainder of the guidelines, key agencies, consultants and international



organisations related to the subject, have been approached to assist the Department.

The Department had also undertaken early steps to improve its current procedure. As a result, the average time of approval per report had been reduced from 4.0 months in 1992 to 2.9 months in 1993, despite the fact that the number of reports to be reviewed by the Department were increased by 37 per cent, and the number of staff were reduced.

Decentralisation

In January 1993, the process of decentralisation of EIA reports processing was initiated. The EIA reports were reviewed and approved by the five DOE State Offices of Johor, Perak, Pulau Pinang, Sarawak and Selangor/Federal Territory of Kuala Lumpur. About 55 per cent of the total reports received were processed by the five State Offices.

Registration of EIA Consultants

Efforts to register EIA consultants for preparation of EIA reports continued in 1993. Comments and proposed criteria for the registration of EIA consultants from relevant agencies including consultants and professional organisations were reviewed and modified. Subsequently, a meeting was held among the relevant agencies to finalise the proposed criteria which would be acceptable to all parties.

Reduction of Backlog EIA Reports

To fulfill the Client's Charter, concerted efforts to speed up the review process continued and the results were encouraging. In January 1993, about 28 per cent of the 68 reports which were not processed in 1992 were more than three

months (backlog EIA reports). On December 31, 1993, although the number of reports not processed remained the same as 1992, no reports were more than three months from the date of receipt by DOE.

Briefings by Project Proponents

In 1993, a total of 24 briefings by project proponents and their consultants were held, mainly for resort, recreational and industrial development projects to facilitate the EIA reviewing process. Representatives from the Drainage and Irrigation Department, Forestry Department, Public Works Department, Wildlife and National Parks Department, and professionals/experts in the relevant fields were invited to participate.

AWARENESS OF EIA

The Department continued its efforts to enhance awareness of EIA among the relevant parties in order to achieve the objectives of sound and sustainable development. In 1993, lectures, briefings and seminars on EIA were given to a wider field of governmental and professional organisations which include the Local Authorities, Geological Survey Department, architects, surveyors and bankers. In addition, the Department briefed the State Governments of Kedah, Kelantan, Pahang, Perak, Pulau Pinang, Sabah, Sarawak and Selangor about the progress of EIA implementation.

A total of 14 colloquiums given by local and foreign expertise as well as DOE officers were held. 5 site visits to various development activities were also organised in an effort to upgrade the skills and expertise of its personnel.



The booklet entitled *Environmental Impact Assessment (EIA) Procedure and Requirements* was revised in May 1993 and additional copies were printed for distribution to project proponents, consultants and other interested parties. These booklets were also distributed at seminars, workshops and lectures. Efforts to produce the booklet in Bahasa Malaysia has also started.

Malaysia's experience in implementing EIA has been recognised by other countries. A post-graduate student pursuing his Doctorate in Philosophy at Kings College, United Kingdom, was attached to the Section for a two-weeks EIA training programme for his desertation work.

ENVIRONMENTAL INPUTS TO DEVELOPMENT PLANNING

In line with the Sixth Malaysia Plan and the Second Outline Perspective Plan, the Department has been actively promoting the incorporation of environmental dimensions in the planning of projects. This was to ensure the protection of the

environment so as to maintain the long term sustainability of the country's development.

In 1993, the Department continued to provide environmental inputs to a total of 45 development and natural resources development projects. This is an increase of 15 per cent from the number provided in 1992 as shown in Figure 4.7. They include development plans, regional master plans, structure plans, management plans, coastal protection works, sewerage, flood mitigation projects and natural resources studies such as energy, tourism, water resources, and biological diversity. Table 4.1 lists the projects and the various stages of study.

Master/Structure/Development/Management Plan

The Department of Environment reviewed and provided inputs for the studies on Coastal Villages Environmental Improvement Project, Sungai Buloh Botanical Park, Malaysia Technology Park, and Environmental Management Study at Sungai Sintok and Sungai Badak, Kedah Darul Aman.

Inputs were also provided for studies on infrastructure projects such as sewerage projects as well as flood mitigation measures for the areas of Sg. Besut, Sg. Kinta, Lemal and Rantau Panjang, Sg. Perai, Sg. Juru, Sg. Jejawi, and Sg. Tengah, Paya Pedu Dam and the National River Mouth Study.

The Department was also actively involved in providing input for the formulation of the Sewerage Services Act and the Privatisation of the National Sewerage Services. This is to ensure that environmental factors are taken into consideration, especially in the identi-

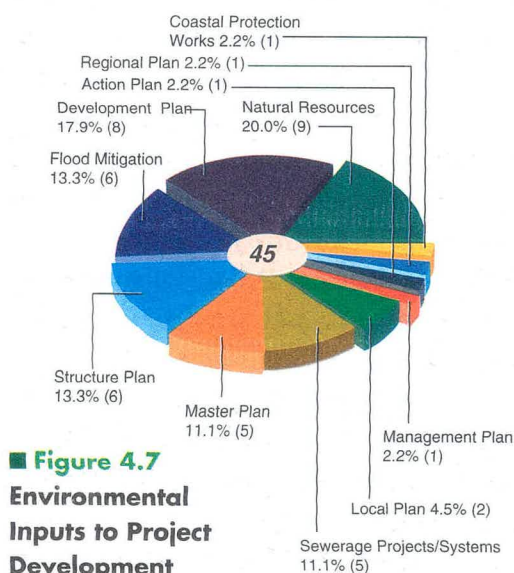


Figure 4.7
Environmental
Inputs to Project
Development
Planning, 1993

Table 4.1 ■ List of Environmental Inputs to Project Development

<i>Type</i>	<i>Project</i>	<i>Stage of Study</i>
Regional Plan	• Tanah Merah Estate, Mukim Jimah	Preliminary
Development Plan	• Coastal Villages Environmental Improvement Project	Draft Final Report
	• Endau-Rompin (Johor) National Park: A Development and Management Plan	First Draft
	• Development of Hot Spring Areas	Draft Report
	• Lumut Maritime Terminal Sdn. Bhd.	Feasibility Study
	• Pantai Kok and Teluk Burau in Langkawi	Interim
	• Feasibility Study: The Rural Growth Center at Sarawak and Environmental Impact Review on the Proposed Plan of The Rural Growth Center at Gedong	Draft Report
	• Pedu and Muda Dam as a Water Catchment Area	Proposal
	• Development of North Triangle Region	Potential Study
Master Plan	• Malaysia Technology Park	Progress Report of Implementation
	• Negri Sembilan Environmental Master Plan	Draft Report
	• Sungai Buloh Botanical Park	Financial and Technical Proposal
	• Technical Report on Environment for Johor	Interim
	• Industrial Master Plan (Iron and Steel)	First Report
Management Plan	• Environmental Management Study at Sungai Sintuk and Sungai Badak, Kubang Pasu District, Kedah Darul Aman	Draft Final Report
Structure Plan	• Gombak and part of Hulu Langat	Terms of Reference
	• Petaling and part of Klang	Draft Final Report
	• Alor Gajah	Inception
	• Jasin	Inception
	• Kuala Langat and part of Sepang	Interim
	• Manjung District and Central Perak	Technical Report





Type	Project	Stage of Study
Local Plan	• Langkawi Island	Interim
	• Langkawi Island Maritime Development	Interim
Action Plan	• Penang Into Twenty First Century	Inception
Coastal Protection Works	• Feasibility Study and Detailed Design of Coastal Protection Works at Pengkalan Datu-Kuala Besar, Kelantan; Kampung Buntal, Sarawak; and Tanjung Aru - Sungai Kinarut, Sabah	Draft Final Report
Sewerage Projects/ System	• National Privatisation Sewerage System	
	• Fine Bubble Air System	
	• Best Lindetres Waste System	
	• Framco Aeration Equipment	
	• Tay Treatment	
Flood Mitigation	• Sungai Kinta	Interim
	• Lemal and Rantau Panjang	Socio Economic Final Report
	• Sungai Perai, Sungai Juru, Sungai Jejawi and Sungai Tengah	Interim
	• Sungai Besut	Interim
	• Paya Pedu Dam Feasibility Study	Inception
	• National River Mouth Study	Progress Report
Natural Resources	• Water Resource Master Plan for Sabah	Draft Final Report
	• Forest/Biological Diversity	
	• Population	
	• Agro-Tourism In Malaysia	
	• Marine Parks	
	• Aquaculture	
	• National Energy Balance	Draft Strategy Paper
	• Integrated Coastal Zone Management	
	• Water Resource	



fication of priority areas for project implementation based on the quality of receiving water bodies.

The environment and related issues and problems form one of the areas to be covered in any structure plan. In this respect, both the natural and the built environment of the local planning authority area under study are taken into account. Input was provided for structure plans prepared for the areas of Alor Gajah, Jasin, Manjung District and Central Perak, Kuala Langat and part of Sepang, Petaling and part of Klang, as well as Gombak and part of Hulu Langat.

Natural Resources

In this sector, the Department participated in providing input for studies on water resources in Sabah, forestry, agro-tourism, population, and marine resources such as marine parks, aquaculture and coastal zone management.

Coastal Protection Works

During the year, the Department continued to provide input to the feasibility study and detailed design for areas in Pengkalan Datu - Kuala Besar in Kelantan, Kampung Buntal in Sarawak and Tanjung Aru - Sungai Kinarut in Sabah.

Environmentally Sensitive Areas

Information gathered over the years on environmentally sensitive areas has been published as the "Directory of Environmentally Sensitive Areas in Malaysia". This directory serves as an important reference to the Department and related agencies in providing environmental inputs and considerations to development planning.

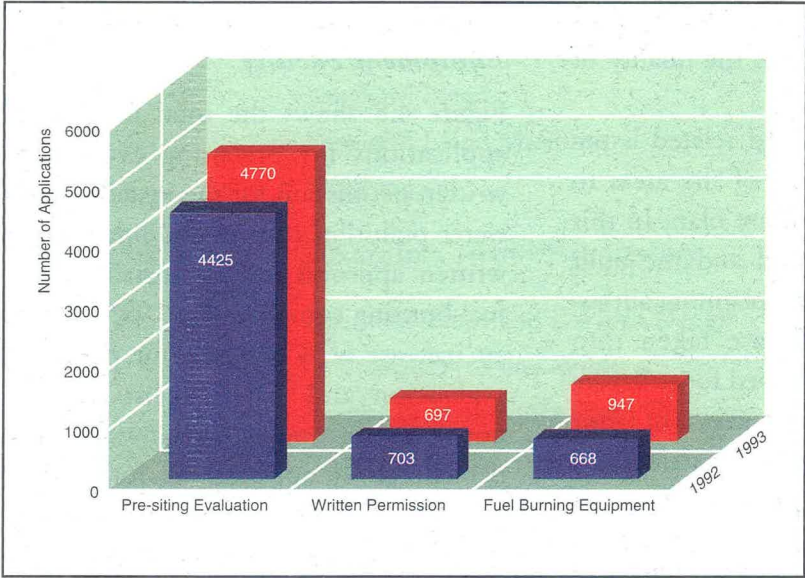
Project Evaluation and Approval of Equipment/Facility

Figure 4.8 shows the total number of applications for pre-siting evaluation, written permission for the installation of water pollution control equipment, and written approval for the installation of fuel burning equipment in 1993. This is an increase of 8 per cent for pre-siting evaluation and 42 per cent for fuel burning equipment. Meanwhile, the percentage of applications for written permission was reduced by 1 per cent.

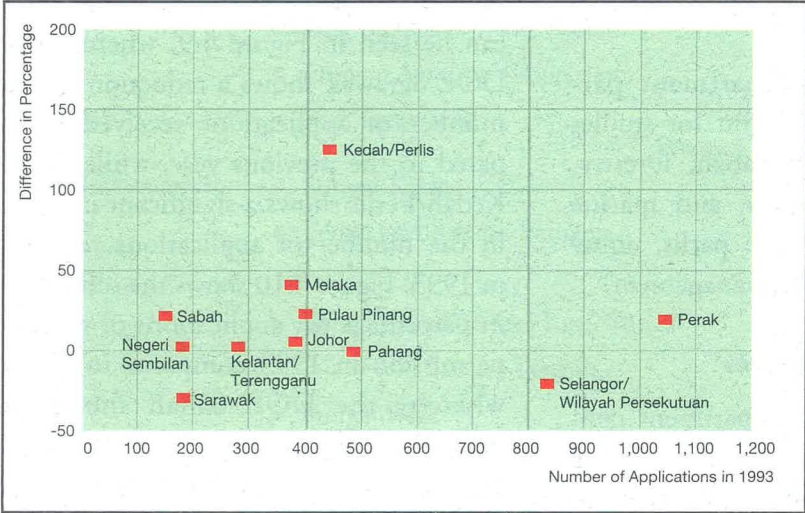
The difference in percentage for the applications of pre-siting evaluation cases in every DOE State Office in Malaysia can be seen in Figure 4.9, whereby the DOE Sarawak shows a reduction in the number of applications received compared to the previous year, while DOE Kedah/Perlis shows a significant increase in the number of applications received in 1993. Figure 4.10 shows the difference in percentage for applications of written permission in 1993 compared to 1992, whereby the DOE Sabah shows an increase in the number of applications received, whilst DOE Sarawak shows a decrease compared to 1992. From Figure 4.11, Sabah also shows an increase in the number of applications for fuel burning equipment compared to other states. DOE Pahang shows a reduction in the number of applications for 1993 compared to 1992.

Geographic Information System

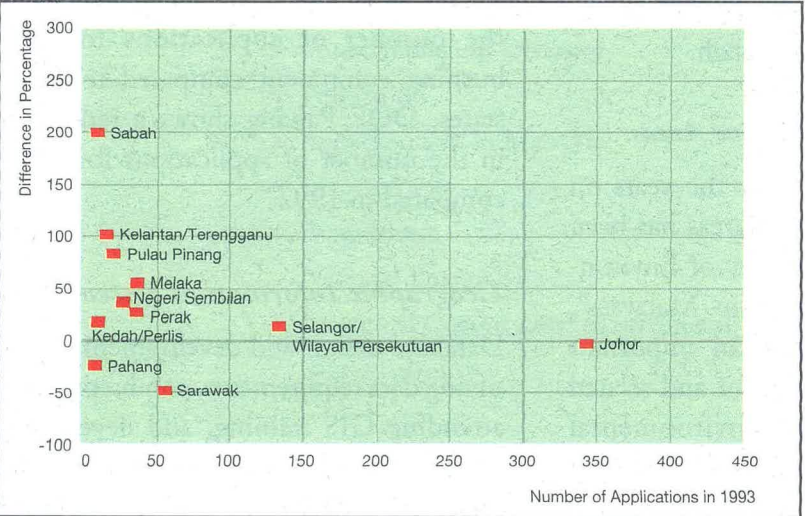
Database design and development, identifying data requirements, conducting and attending GIS training, and developing procedures for work flows were emphasized throughout 1993. A digital



■ **Figure 4.8**
Malaysia: Total Number of Applications for Pre-siting Evaluation, Written Permission and Installation of Fuel Burning Equipment, 1992-1993



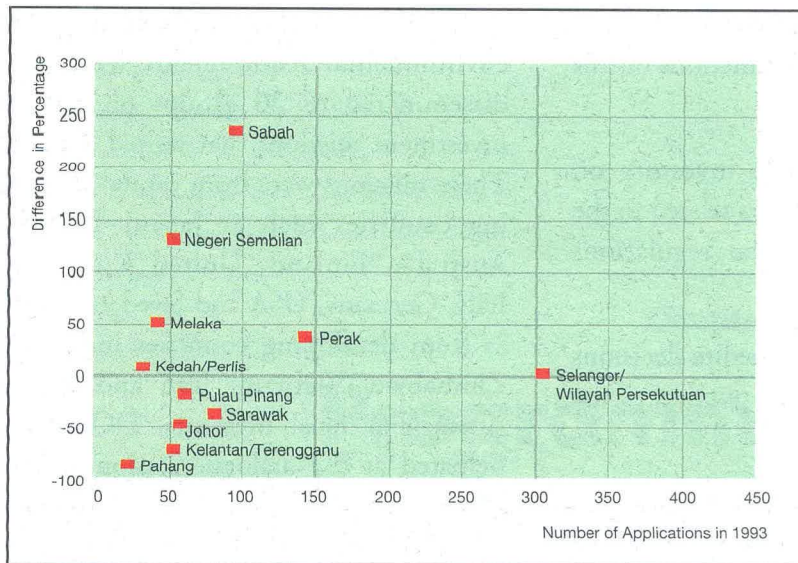
■ **Figure 4.9**
Malaysia: Percentage Difference in the Number of Pre-siting Evaluation Cases Received, 1992-1993



■ **Figure 4.10**
Malaysia: Percentage Difference in the Number of Applications for Written Permission, 1992-1993



Figure 4.11
Malaysia:
Percentage
Difference in the
Number of
Applications for
Installation of
Fuel Burning
Equipment,
1992-1993



database was developed for the State of Negri Sembilan in conjunction with the formulation of the Environmental Master Plan by the State Economic Planning Unit. The database, which also serves as a prototype for other states, consists of several thematic layers of information namely:

- State, district and “mukim” boundaries;
- Major road networks;
- River and drainage systems;
- Current landuse;
- Forest reserves;
- Environmental sensitive areas;
- Distribution of industries;
- Location of drinking water intake points;
- Water catchment areas;
- Distribution of EIA projects by activities;
- Water quality monitoring networks;
- Water resources - existing and proposed dams;
- Proposed river classification based on beneficial uses; and
- Land capability classification for agriculture based on soil types.

The database also consists of geo-referenced scanned images (topographic maps) and rectified satellite images of both Landsat TM and SPOT. Digital database development was expedited through data conversion services that were contracted out to GIS bureau services companies.

The Unit also collaborated with other Government agencies namely, The Malaysian Centre for Remote Sensing, Department of Agriculture, Department of Irrigation and Drainage, Department of Survey and Mapping Malaysia, and the Meteorological Services Department, to map potential erosion risk areas for the upper Klang Valley region. The potential erosion risk map was used to assist landuse planning especially for hilly areas.

ADVISORY SERVICES CENTRE AT MIDA

The Department of Environment has assigned a senior officer to the Advisory Services Centre at MIDA to advise and assist investors on matters related to the



implementation of the Environmental Quality Act, 1974. The functions of this officer are:

- (a) to assist and advise investors on policies and procedures related to the various environmental regulations and guidelines; and
- (b) to help MIDA to expedite decisions on matters under the purview of the Department.

In 1993, 76 investors both local and foreign visited the Centre to seek advice on environment related matters. These investors were given the following assistance:

- (a) advise on compliance, approvals and licensing requirements under the Environmental Quality Act, 1974 and regulations made thereunder;
- (b) information and advice as to whether a proposed investment project was subject to the EIA Order and the appropriate approach to implementation;
- (c) information and advice on proposed project sites;
- (d) explanation and information on DOE policies and guidelines relating to industrial development, such as toxic wastes management, Montreal Protocol and incentives available for pollution control; and
- (e) appropriate application forms with respect to approvals required by DOE.

Further to that, information on environmental requirements were also disseminated to 26 groups of foreign investment missions that visited MIDA. These missions were from capital exporting countries such as Japan, Taiwan, Australia, Finland, United Kingdom, Italy, Germany, USA and Sweden as well as from developing countries including Zimbabwe, Vietnam, Iran and South Africa. For local investors, DOE participated at the dialogue session of the Domestic Investment Seminar organised by MIDA/MITI/FMM, to answer questions on environmental matters.

In 1993, 802 applications with proposed total capital investment of RM18,212.3 million were received by MIDA for manufacturing licences under the Industrial Co-ordination Act, 1975. These applications were evaluated by the Action Committee on Industries (ACI) which consist of representatives from the Ministry of Finance, Inland Revenue Department, MITI, MIDA and DOE. The DOE representative provided inputs on environmental requirements and policies to expedite decision making of the Committee. Of the 802 applications received, 653 were approved in 1993 while 32 projects were subjected to the EIA Order.

To further assist the investors, a booklet on *Environmental Requirements: A Guide to Investors* prepared by DOE was revised in 1993. The revision was meant to provide new information and to update the existing ones. This revised version is expected to be ready in 1994.