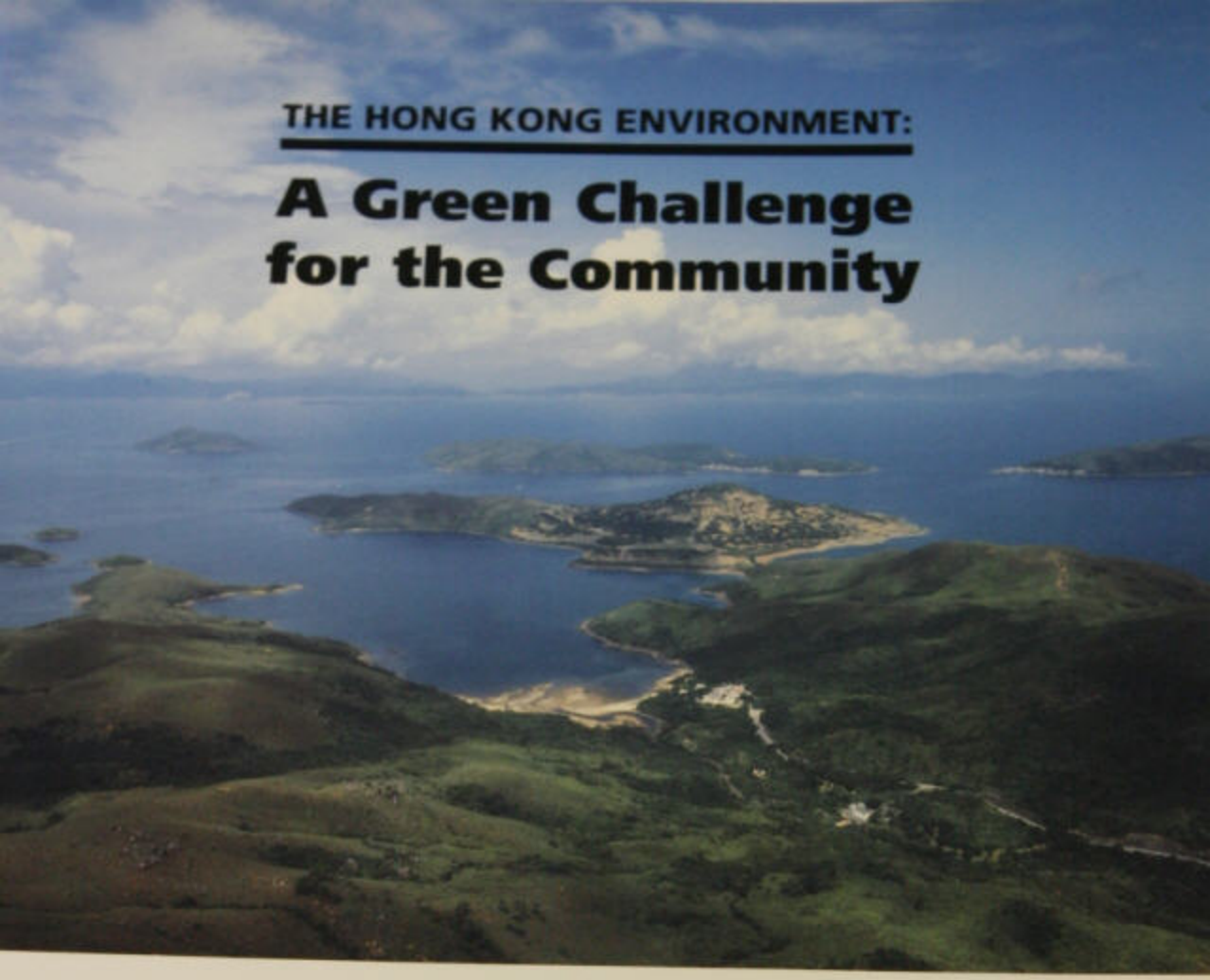
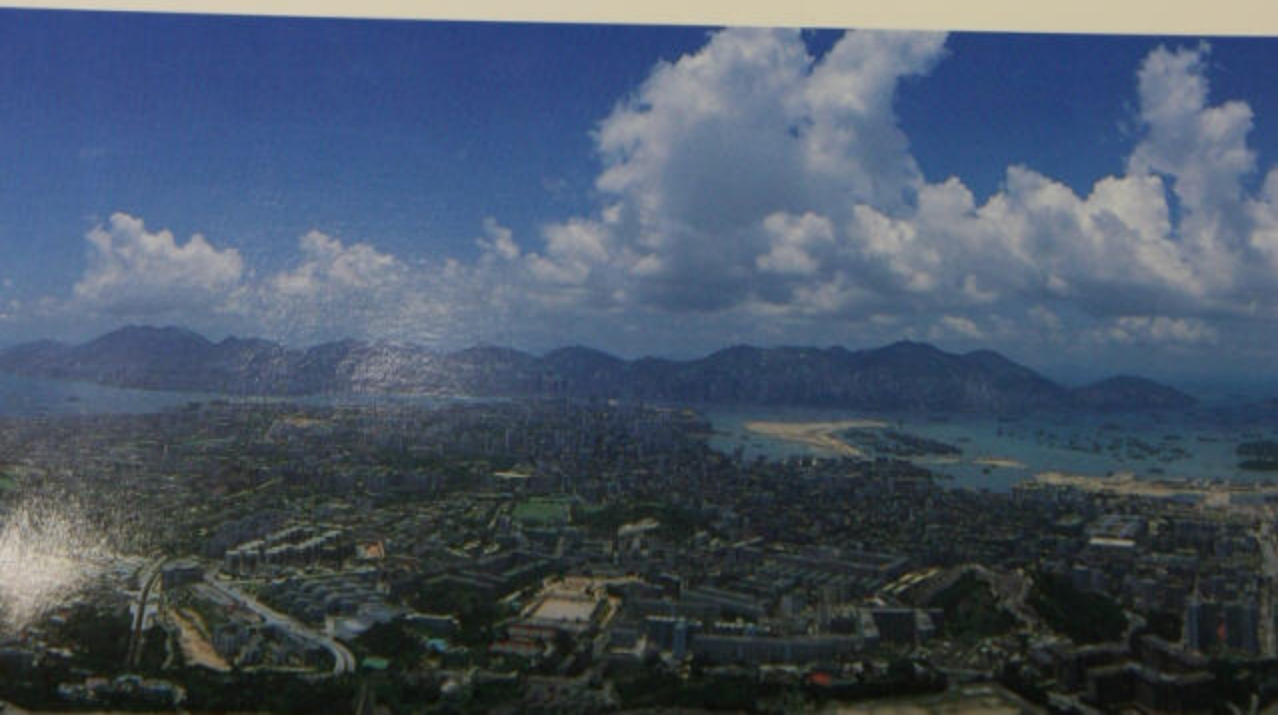
THE HONG KONG ENVIRONMENT:

A Green Challenge for the Community



Second review of the 1989 White Paper
Pollution in Hong Kong — A time to act



THE HONG KONG ENVIRONMENT:

A Green Challenge for the Community

Second review of the 1989 White Paper
Pollution in Hong Kong — A time to act

Planning, Environment and Lands Branch
Government Secretariat
November 1993

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CHAPTER 1

PREFACE

MESSAGE FROM THE GOVERNOR

"We all want a greener Hong Kong. We all want to be able to breathe fresh, clean air; to be able to bathe in clear, safe seas; and to live our lives in as pleasant an environment as we can."

1.2 In Hong Kong, healthy economic growth has not always been accompanied by quite such a wholesome regard for our environmental well-being. Rightly, we demand high standards from so many aspects of our daily lives as we pursue success for our companies, success for ourselves. Now it is time to start paying the same attention to the way in which we look after the environment in which we actually live, not least if we are to continue to enjoy the prosperity we all value so much.

1.3 Since I became Governor, I have put the environment right at the top of my political agenda. Already we have made considerable improvements — you will find them chronicled here in this admirable second review of the 1989 White Paper.

1.4 This extremely thorough document sets out in detail what we have achieved, what we are still working on, what more we hope to do in the future.

1.5 One theme runs through all of the review's pages: the theme of responsibility. We are all — Government, businesses, families, and individuals — responsible for the environment. Our actions and choices have environmental consequences. We have to learn — all of us — to take account of the environment in all we do. That applies as much to the individual supermarket shopper as to the mightiest business.

1.6 We are very fortunate in Hong Kong. Unlike elsewhere in the world, here we actually have an economy which is generating the resources we need to fund serious environmental protection. We have made a start on that — but as a community we have a great deal more to do, and we have no excuses not to get on with it with vigour and determination.

MESSAGE FROM THE SECRETARY FOR PLANNING, ENVIRONMENT AND LANDS

1.7 This second review of the 1989 White Paper presents an opportunity to report on more than the progress of our environmental programmes. While this feature of the report is important, it should also be understood that the many and various programmes have one main aim — to protect our environment so that it can support us, and future generations, in a healthy, sustainable way.

1.8 This second review therefore seeks to inform Hong Kong people about the environment, as well as to bring them up to date on current and planned programmes to protect the environment. To achieve this purpose the report is set out in 3 sections, or STEPS:

STEP I Understanding Our Environment
STEP II Protecting Our Environment
STEP III Sustaining Our Environment

1.9 STEP I (Chapters 3 and 4) is aimed at creating an understanding of, and sympathy for, Hong Kong's environment. Chapter 3 describes in some detail the nature of Hong Kong's environment so that we can all have a picture of just how varied and wonderful it is. Chapter 4 then sets out certain principles — or foundation stones — for protecting that environment. This is to enable us to understand what the environment is, how events and activities affect it, and what principles should guide our efforts to protect it.

1.10 STEP II (Chapters 5 and 6) describes all the major aspects of our current environmental programmes. Chapter 5 sets out the measures to protect the natural environment described in Chapter 3, and Chapter 6 describes the many anti-pollution measures which have been introduced to protect the key elements of our environment, such as air and water, and to make Hong Kong a quieter city.

1.11 But understanding and protecting our environment *now* is only part of the task. We must also *sustain* it for our children and future generations. This requires us to find ways of reducing the heavy burden placed on the environment by our current life styles. STEP III (Chapters 7 to 10) therefore describes how we might start out on a more sustainable path by getting ahead of environmental problems; by becoming more energy efficient; by fulfilling our environmental obligations under a wide range of international conventions and agreements; and by working together to tackle environmental issues.

1.12 Few of the measures necessary to protect and sustain our environment are without cost, and Chapter 11 describes these and suggests we all share such costs. Normally, payments are based on the Polluter Pays Principle and this principle is examined in detail.

1.13 It is important for us all to read this document, to consider what it has to say, and to offer our views on the problems and the solutions. It is, indeed, the purpose of its publication to stimulate informed discussion on the issues.

CHAPTER 2

INTRODUCTION

2.1 This Chapter describes the contents of this, the Second Review of the 1989 White Paper, and explains the theme and structure of the Review. It also summarises the progress on implementing the main pollution control programmes set out in the first environment White Paper (*Pollution in Hong Kong — A time to act*) published in June 1989.

The 1989 White Paper: Pollution in Hong Kong — A time to act

2.2 At the opening of the 1988/89 session of the Legislative Council on 12 October 1988, the Governor said that serious environmental pollution is an unfortunate by-product of Hong Kong's economic success and population growth (and that) one of our major priorities must be to halt this pollution and to do more to improve our environment. On 25 October 1988, the Executive Council advised that a White Paper should be prepared on pollution and Hong Kong's first environment White Paper was published in June 1989. It was entitled *Pollution in Hong Kong — A time to act*, and in pursuit of that title the White Paper outlined a comprehensive ten year programme to tackle pollution. Briefly, the thrust of this programme was to ensure the provision of environmentally acceptable but cost-effective waste disposal facilities; a determined attack on air pollution; a substantial programme of sewage treatment and disposal facilities; a series of measures to make Hong Kong a quieter city; a broad programme of environmental legislation; and a campaign to raise Hong Kong's environmental awareness.

The First Review of the 1989 White Paper — May 1991

2.3 In May 1991, a review was published that summarised the progress of the hundred or so initiatives to tackle environmental pollution that had been outlined in the 1989 White Paper. The Review noted that although ambitious targets had been set in 1989, during the first two years of the programme progress had been reasonably encouraging. The Review also noted that some elements of the programme — particularly these aimed at controlling water pollution — were being implemented more slowly than was desirable and would take longer to achieve (more will be said on this issue in Chapter 5). Nevertheless, by illustrating that government had given a major

priority to the task of tackling environmental pollution, the overall review was encouraging.

2.4 A detailed summary of progress against targets is set down in Annex A; the main achievements have been:

(a) **Air pollution**: dramatic reductions in air pollution in some areas followed the introduction of legislation in July 1990 to reduce the sulphur content and viscosity in fuel oil. The mandatory sale of unleaded petrol at all filling stations from 1 April 1991, has resulted in almost 60% take-up rate. Stringent international emission standards for most categories of new vehicles were introduced on 1 January 1992. Further amendments to the Air Pollution Control Ordinance to extend the provisions against specified industrial processes and to control asbestos were passed by the Legislative Council in February 1993.

(b) **Noise pollution**: improvements have been achieved via controls on percussive piling and other noisy construction activities, the application of a Construction Noise Permit system, the extension of the schools insulation programme and an increase in the number of roads treated with noise reducing surface materials. The Road Traffic Ordinance was amended in November 1992 to empower the Commissioner for Transport to implement traffic management schemes on environmental grounds. Two new regulations prescribing quieter percussive breakers and compressors were brought into force in 1992. Further amendments to the Noise Control Ordinance were introduced to the Legislative Council on 12 May 1993 to ban particularly noisy powered mechanical equipment (PME) and non-PME work during restricted hours in densely populated areas. In addition, noise assessments carried out at the planning stage resulted in projects incorporating barriers and covers, or in the provision of insulation to affected premises. These planning efforts reduced the percentage of new premises exposed to noise levels higher than that set down in the Hong Kong Planning and Standards Guidelines to an estimated average of 6% from a previous high of 21%.

(c) **Waste disposal**: a strategy based on the provision of three very large landfills in the New Territories has been implemented. Waste will be taken to these sites from a network of refuse transfer stations (RTS) located at carefully chosen sites in the urban area. This will allow urban landfills and incinerators to be phased out. A contract for the first large landfill was awarded on 21 May 1993. The second RTS (Hong Kong Island East) was opened in January 1993. Significant improvements in the control of chemical and toxic wastes were achieved via the introduction of the Chemical Waste Regulation under the Waste Disposal Ordinance in November 1992, and the commissioning, in April 1993, of the Chemical Waste Treatment Centre (CWTC) which is able to treat most of the approximately 100,000 tonnes of chemical waste that industry produces every year. In July 1992, proposals for a licensing scheme to control livestock wastes at poultry farms in the New Territories were released. After consultation with farmers a revised package was put to farmers in December 1992. The importance of reaching agreement on measures to control livestock waste cannot be stressed enough; despite the large sums being spent on new sewerage facilities, unless livestock wastes are properly controlled we will not be able to clean up heavily polluted rivers and streams in the New Territories.

(d) **Water Quality**: substantial improvements to water quality cannot be expected until the late 1990's, due to the need to put in place a massive new sewerage network and associated controls under the Water Pollution Control Ordinance. But investment is underway and the detailed planning for an extensive new programme of sewerage has started. Priority is being given to sewage collection, treatment and disposal arrangements for Kowloon and eastern Hong Kong Island in the High Priority Programme (HPP) which will be completed by mid-1997. Preliminary design of the

Strategic Sewage Disposal Scheme (SSDS), that is the deep underground tunnels, is complete and detailed design of the first stage began this year. Construction work has already started on some of the regional Sewerage Master Plans (SMPs) e.g. East Kowloon and North West Kowloon, which basically support the strategy. However, work on the HPP is not being done to the exclusion of new sewerage in other parts of Hong Kong. For example, there are substantial sewage projects in:

- Hong Kong Island South Sewerage Scheme ($0.8 billion)
- Tolo Harbour Effluent Export Scheme ($0.9 billion)
- Tolo Harbour Sewerage Improvement ($0.3 billion)
- North West New Territories Development Sewerage Scheme ($1.1 billion)

By any standard, Hong Kong is planning and building a major programme of sewerage which will clean up our harbours, rivers and streams.

(e) **Environmental Impact Assessment (EIA)**: all major development projects are now subject to such assessments so that the potential for environmental damage is considered at the planning stage and so that the public are consulted on the project. (For example, a District Board would be consulted on an EIA associated with a project in their district, and fishermen's groups consulted on a major dredging proposal.) The majority of EIAs are scrutinised by the Environmental Pollution Advisory Committee (EPCOM). Environmental Implications paragraphs have been required in Executive Council papers since October 1992, and in papers put to the Public Works Sub-committee since December 1992.

(f) **Environmental Education**: A forceful environmental awareness campaign was launched in late 1989 after the publication of the 1989 White Paper. More effort is now being put into educating the community on the dangers of pollution and on the measures required to clean up the environment The Environmental Campaign Committee (ECC), which has had several successful campaigns, has organised public environmental seminars and produced school teaching kits, and is keeping environmental issues in the public eye. The various green groups are also publishing more materials on the environment.

(g) **Energy Efficiency**: As early as 1983, the then Architectural Office published a booklet entitled *Energy Conservation in Buildings*. This booklet was revised and reprinted in 1989 and issued to architects, engineers and maintenance surveyors. The Energy Efficiency Advisory Committee was established in April 1991 and tasked to formulate a comprehensive energy efficiency policy for Hong Kong in order to promote the efficient use of energy and to reduce pollution caused by burning fossil fuels. To date, the Committee has overseen the publication of a draft handbook on Overall Thermal Transfer Values (OTTV) to assist architects in designing more energy efficient buildings, prepared a report on energy consumption patterns in commercial buildings, compiled advisory notes on good energy housekeeping in commercial buildings and introduced an education campaign on energy efficiency.

(h) **Protection of the Ozone Layer**: Hong Kong has succeeded in cutting by more than half the consumption of chlorofluorocarbons (CFCs) and is on target to meet an accelerated phase out of halons by 1994 and CFCs by 1996. On 11 November 1992, the Legislative Council passed an amendment to the Ozone Layer Protection Ordinance to further control the import of other ozone depleting substances.

Did the 1989 White Paper go far enough?

2.5 Despite these achievements, there has been criticism that the programmes outlined in the 1989 White Paper did not go far enough. In

summary, its critics seemed dissatisfied that it did not contain proposals for a comprehensive conservation policy, for a comprehensive energy efficiency policy, for a broader treatment of environmental issues in the school curriculum, for a comprehensive community environmental awareness and education programme, for a more comprehensive analysis of the impact of environmental programmes on other areas of government policy (such as transport) and for a more detailed treatment of recycling. More recently, and especially since the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in June 1992 ("the Earth Summit"), there have been calls for policy statements by government towards such issues as sustainable development, global warming, biodiversity and the protection of rainforests. In addition, and to demonstrate commitment to the goals of the Earth Summit, green groups have called upon the government to ratify formally the several treaties and conventions that were adopted at the Earth Summit.

2.6 All of these views are understandable. As greater awareness of environmental issues spreads throughout the community, it is to be expected that there will be more calls upon government — whether from individuals, concerned groups, legislators or the media — to take decisive action to protect the environment on a much broader front. This view is also shared by EPCOM, which is charged with advising the government on pollution issues. (Expanded responsibilities for this Committee are discussed in Chapter 10). However, it should be remembered that the 1989 White Paper and the programmes outlined therein were an attempt to come to grips with Hong Kong's pollution problems, most of which could be attributed to years of neglect because the community had given priority to other areas. As a community we were not unusual in this. During the challenging post war years, many countries made investment choices, and allocated priorities, to programmes that created jobs and enhanced welfare rather than to programmes that protected the environment. This approach has led to environmental degradation in many parts of the world and Hong Kong has been no exception.

2.7 The programmes contained in the 1989 White Paper were therefore action plans to halt Hong Kong's environmental decline, to deal with its worst environmental abuses, and to lay the foundations for environmental improvement. By and large, these actions have been successfully introduced and the foundations for a much improved environment have been firmly laid. The time has therefore come to build on these foundations to improve further Hong Kong's environment, and in so doing to address the environmental issues that have more recently come to the fore.

The Second Review of the 1989 White Paper

2.8 This Second Review of the 1989 White Paper is therefore a more comprehensive document than the First Review published in 1991. It has several purposes — to review the progress of our environmental protection programmes so far; to set down the basis for future action to protect Hong Kong's environment; and to explain several initiatives for improving the government's own performance in environmental protection. The Review has two other important objectives both of which are fundamental to our efforts to protect Hong Kong's environment. First, and by virtue of the comprehensive treatment of Hong Kong's environmental issues that are indicated in it, the Review is intended to be an educational and informative tool which outlines for the first time the very nature of Hong Kong's environment that we are seeking to protect and sustain. Second, the Review takes as its starting point the belief that environmental protection is not the sole responsibility of any particular sector of our community, but an obligation that rests with us all. Because of this there is a need to educate the community to strengthen attitudes, values and actions that are environmentally sound and that support sustainable development. It is for this reason that the Review is also intended as an educational resource which

informs Hong Kong residents about the environment in which they live, work and play, and which explains the effects of their daily lives on the environment which sustains them, and which must also sustain their children and future generations.

2.9 The Second Review of 1989 White Paper is therefore based on the three steps described in the Preface. That is:

Step I Understanding our Environment (Chapters 3 and 4)

Step II Protecting our Environment (Chapters 5 and 6)

Step III Sustaining our Environment (Chapters 7 to 11).

These three steps will straddle a variety of activities:

Chapter 3 provides an overview of Hong Kong's environment, discusses why we need to protect it, and analyses what special problems this obligation to protect our environment may bring to a community of our special size and characteristics;

Chapter 4 summarises the basic principles for protecting our environment, principles which are quickly becoming common coin to all modern societies seeking to protect their environment;

Chapter 5 describes the measures, based on the principles described in Chapter 4, that are proposed to be taken to protect our natural environment;

Chapter 6 describes the measures, based on the principles described in Chapter 4, that are proposed to be taken to protect other features of our environment;

Chapter 7 outlines the measures that are necessary to prevent environmental problems rather than the measures necessary to control pollution once it has occurred;

Chapter 8 discusses our proposals for energy efficiency and conservation;

Chapter 9 outlines our international obligations for environmental protection;

Chapter 10 discusses the community's role in environmental protection; and

Chapter 11 sets out the cost of protecting our environment, and how these costs may be met.

2.10 The step by step approach outlined in these paragraphs will enable the community to progress towards a better awareness and understanding of our environment, and an appreciation of the challenges that must be faced, if Hong Kong's environment in the twenty-first century is to sustain our community as successfully as it has in the past. But this must be clearly understood from the outset: the measures necessary to clean up Hong Kong's environment to the extent required to overcome the abuses of the past, and to protect that environment to the extent necessary to sustain the well-being of ourselves and our children in the future, will require not just the expenditure of even more substantial sums on environmental programmes, but a fundamental change to the way we approach the environment and our daily lives. Chapter 10 — which includes a discussion on the community's role in environmental protection — is therefore particularly important.

STEP 1

UNDERSTANDING OUR ENVIRONMENT

CHAPTER 3

AN OVERVIEW OF HONG KONG'S ENVIRONMENT

Why we need to protect it

3.1 Before we consider the structure of Hong Kong's environment, it is important to understand why that structure needs protecting. It is particularly important to understand why it cannot continue to sustain our community without lasting damage, as it seems to have done for so long. Moreover, in Hong Kong there are special reasons why we should give particularly careful attention to the environment.

3.2 First and obviously, our community is constrained by a lack of space. In an area of about 1,000 square kilometres we sustain nearly 6 million people (and another 7 million visitors annually) in one of the most economically energetic and socially active communities in the world. To sustain this population and its activities, and to keep it moving, requires a transport system with 1,533 kilometres of roads, 119 kilometres of rails, 495,801 registered vehicles, an extensive network of ferry services *and* an airport operating at near capacity of 22.1 million passengers annually. Compounding the impact of these activities is the fact that not all of Hong Kong 's 1,000 square kilometers of land is developable. These facilities, therefore, are all provided within, or in the vicinity of, highly populated areas. (Mong Kok district with a population of 170,368 (1991), has a density of 116,531 persons per square kilometre, probably the highest in the world.) Although some environmental improvements will materialise with the provision of better infrastructure and amenities being provided through urban renewal, this is inevitably a lengthy and costly process. Hong Kong therefore faces environmental problems on a scale few other communities have to face. Whatever our environmental problems, and however we seek to overcome them, this constraint will not change and we will always have limited space in which to manoeuvre.

3.3 A second consideration is the very nature of our current life-styles, particularly our general expectations for material progress. In Hong Kong, because of our economic record, we have come to expect high rates of growth and prosperity and to expect that such growth will continue indefinitely. It is partly these expectations which have led most of us to measure success in material terms and, because space is limited, to ignore the adverse impact such growth has had on our environment. But this level of activity cannot leave our environment

3.1 Aerial Photograph of a housing estate

untouched or unscathed. The resources that make up this physical environment — air, water, land and the animals and plants that are part of them — have never been under so severe a threat as they are now. This is because we have continued to enjoy the benefits of economic growth at levels that are the envy of many. Unfortunately, as a community, we have not adequately acknowledged the special strains that this growth has placed upon the environment. As we shall see below, in some areas our environment is now seriously damaged.

3.4 There is also a need to protect the environment to enable it to contribute towards our general well-being, for example, by creating opportunities for education and recreation in the countryside. In addition, we have a moral obligation to preserve natural habitats for scientific study and for the benefit of future generations.

3.5 We therefore need to be more concerned about the environmental consequences of our activities. This does not mean dispensing with economic growth and prosperity and not having high expectations. But it does mean adding a sustainable dimension to our plans for economic growth, and giving a green dimension to our general expectations. It also means taking steps to protect the environment *now* because sooner or later it will be forced upon us. If we delay, the eventual cost of rehabilitation will be many times greater than the cost of early action. These extra costs would fall on our children.

Stewardship

3.6 One of our first tasks therefore is to acknowledge, as a community, that we cannot go on abusing the environment in the future in the careless manner that we have adopted in the past. Rather, we must quickly develop towards our environment the same level of aspirations that we clearly hold for our economic environment, for our

schooling and for our housing. Our aim should be to aspire for healthy living sustained by clean air and water and by a caring attitude towards our city and its rural surroundings. Our objective should be not only to protect the environment for ourselves, for all flora and fauna, but also for our children and future generations so that they can also live healthy and active lives. This is because our children have a right to inherit from us an environment from which they can meet their needs as we have met ours, and because we have a duty — a duty of stewardship — to hand on to them an environment in good repair.

3.7 As a first step in exercising our duty of stewardship we must recognise, as other communities have, that our actions do not have a benign effect on the environment but, on the contrary, seriously threaten it. We must also acknowledge that the path from environmental neglect and degradation to a clean and healthy environment, which can sustain the legitimate needs of both ourselves and future generations, cannot be achieved easily and cannot be achieved using only the machines and methods of modern science. Although science and technology will continue to play a vital role in solving environmental problems, it is now clear that science or technology, of themselves, cannot resolve the environmental problems currently facing the global community.

3.8 We should therefore approach the twenty-first century remembering that material prosperity and technological advancement are not necessarily synonymous with general contentment. Cautioning against the optimism that surrounded the close of the *nineteenth* century, the American philosopher George Santayana said that, "Never before had man known so many facts and been master of so few principles". As we approach the close of the *twentieth* century mankind is, arguably, still master of so few principles despite having become acquainted with so many more facts.

3.9 As a community we must therefore accept the principle that we have a responsibility of stewardship towards the environment, that is, a responsibility to ensure that it is properly conserved so that we can first overcome the environmental degradation of the past, and then protect and improve the environment for ourselves and future generations. To fulfil this responsibility of stewardship, the community requires a common framework. Chapter 4 therefore sets out briefly the supporting principles on which this White Paper Review is based. First of all, let us look briefly at the environment we seek to sustain and over which we must exercise stewardship.

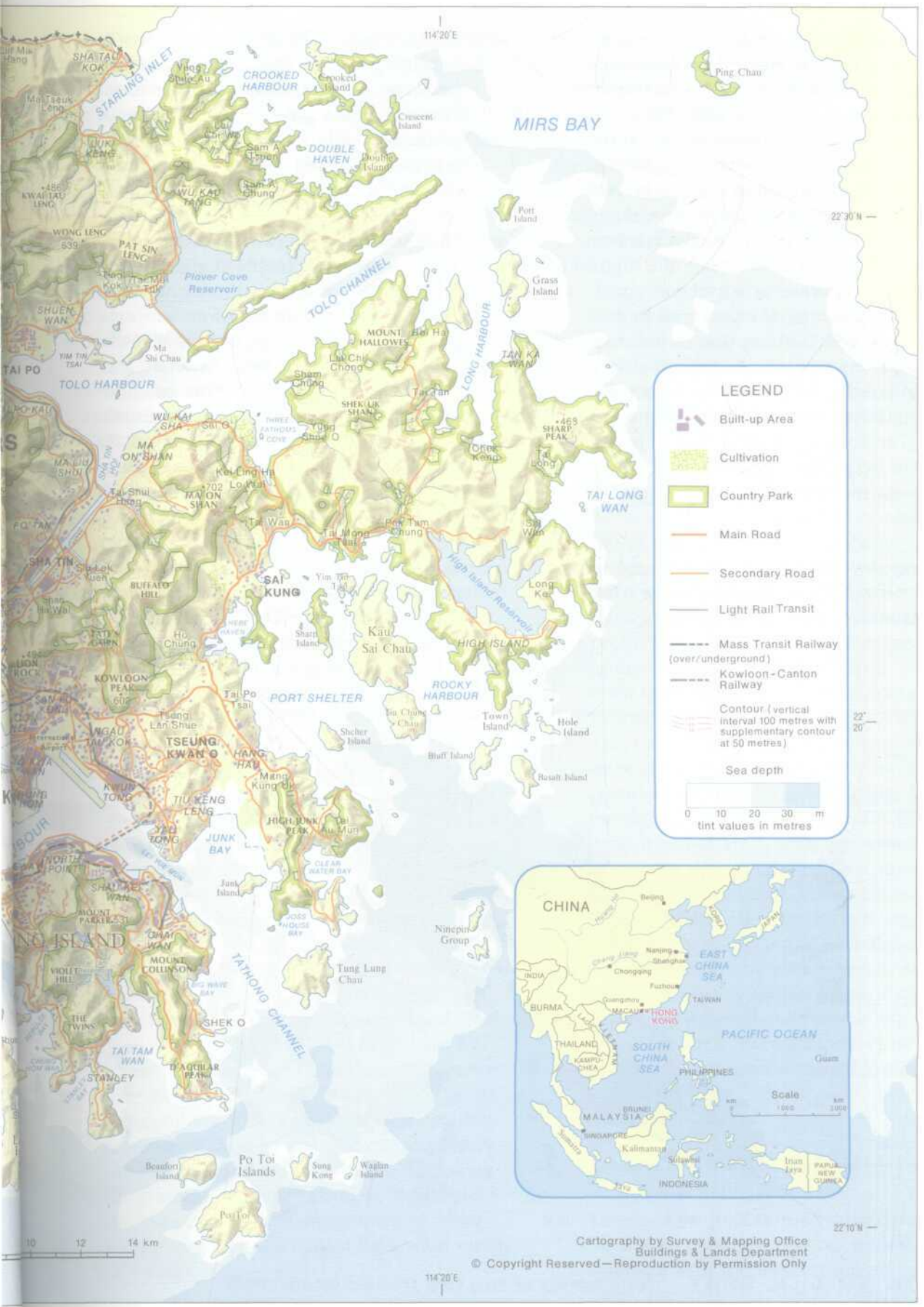
Hong Kong's natural environment

3.10 "Stewardship" begins with an understanding of the environment in which we live. The following paragraphs therefore not only outline the structure of our local environment but also seek to emphasise an important message — that becoming more familiar with the environment that sustains our lives will enable us to understand its frailties and the integrated and dependent part that we, as one of the major organisms that comprise it, play in this integrated ecosystem. An understanding of our natural environment is important because it is now clear that the Earth itself is an integrated whole, combining land and water with air and space into a single ecosphere. Interference with one part can therefore damage another, as we are now realising from damage to the ozone layer and the effect on climate because of the excessive release into the atmosphere of global warming gases.

The Land

3.11 Scenically, Hong Kong has a great deal to offer, with a landscape rising from sandy beaches and rocky foreshores to heights of almost a thousand metres, woodlands and mountain ranges covered by open grassland and a variety of scenic vistas rarely matched in so small a territorial unit. The

3.2 Topographical map of Hong Kong

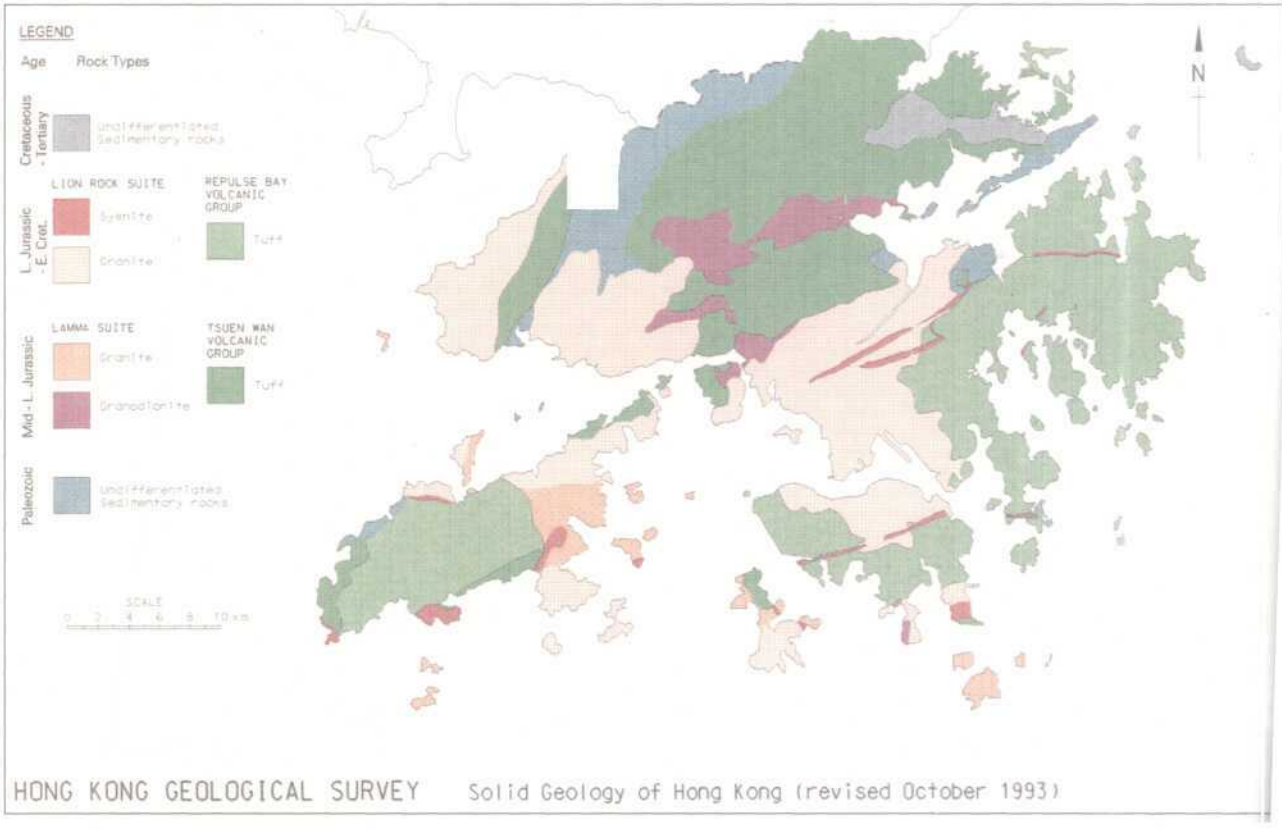


Cartography by Survey & Mapping Office
Buildings & Lands Department

topography of Hong Kong is characterised by steep granitic and volcanic mountains — some 40% of the landmass is volcanic in origin, about 20% is granitic, 15% is colluvial and almost 10% is alluvial in nature. The highest peak is Tai Mo Shan (957 metres) located in the central New Territories, and there are four peaks which exceed 750 metres, all of which are on Lantau Island. Victoria Peak, the highest on Hong Kong Island and a major tourist attraction, is ranked eighteenth in the Territory with an elevation of 552 metres. Hong Kong's peaks are generally deeply weathered and much of the terrain is prone to landslips. More than 20% of the terrain in the Territory shows evidence of instability, as we frequently discover during the heavy rain-storms that are a feature of our monsoon climate.

3.12 Generally, the granitic and volcanic rocks can be excavated quite easily for use as reclamation material, and sand and gravel dredged from offshore areas are also a valuable fill resource. Almost four thousand hectares of the developed land is reclaimed. However, the extensive modification of the landscape and the large land and marine borrow areas create substantial environmental problems.

3.13 Much of the undeveloped terrain in Hong Kong consists of steeply sloping ground where soils are thin and nutrients deficient. Hong Kong's terrain therefore supports only grassland or scrubland, except in protected valleys where small areas of broad leaf woodland survive, or in water catchments and country parks where re-afforestation has succeeded in establishing pines and deciduous trees. Nor does Hong Kong have plentiful mineral resources, although deposits of lead, zinc, quartz, beryl and graphite have been mined in small quantities, and iron and tungsten were once extracted in significant amounts. Only kaolin is currently worked within the Territory.



3.3 Geological map of Hong Kong

3.14 There are more than five thousand hectares of alluvial floodplain in the Territory and much of it is located in the Yuen Long district. Although this plain is frequently flooded (the government is now embarked on a comprehensive plan to build drains, nullahs and river training to alleviate these problems) the Deep Bay area adjacent to it is an area rich with natural fauna and flora, particularly the Mai Po Marshes.

Plantlife

3.15 Situated near the northern limit of the distribution of tropical Asian flora, Hong Kong has an abundant variety of plant life — about 2,600 species of vascular plants, both native and introduced. New species are also occasionally discovered.

3.16 Hong Kong, and most of the adjacent parts of south China, was once covered by evergreen or semi-deciduous forest. However, before the introduction of conservation measures the hillsides were becoming increasingly bare of trees. This was the result of cutting, burning and exposure to the elements and on most hillsides the only cover was coarse grass or scrub, although possible remnants of the original forest cover, either scrub forest or well-developed woodlands, are still found in steep ravines where their isolation has protected them. There are also small but well-developed woodlands near many of the older villages and temples. These so-called 'fung shui' groves owe their existence to protection by the villagers under 'fung shui' traditions. Now, many slopes, especially those in the water-gathering grounds, have been planted with trees of both local and exotic species. These woodlands and other areas of countryside are protected and, in view of the growing numbers of people spending increasing amounts of their leisure time outdoors, they are being developed. In addition to making the countryside more beautiful, woodlands are important in the management of water catchments and as a habitat for a wide variety of wildlife.

3.17 Grassland is commonly found on hilltops and in many places it extends to the lower slopes where the soil is poor or where fires frequently occur. Grassland also covers many of the off-shore islands where the slopes are often steep, the rainwater run-off is rapid and the winds are salt-laden. Scrubland occupies most of the hillslopes and forms a transitory area between grassland and woodland.

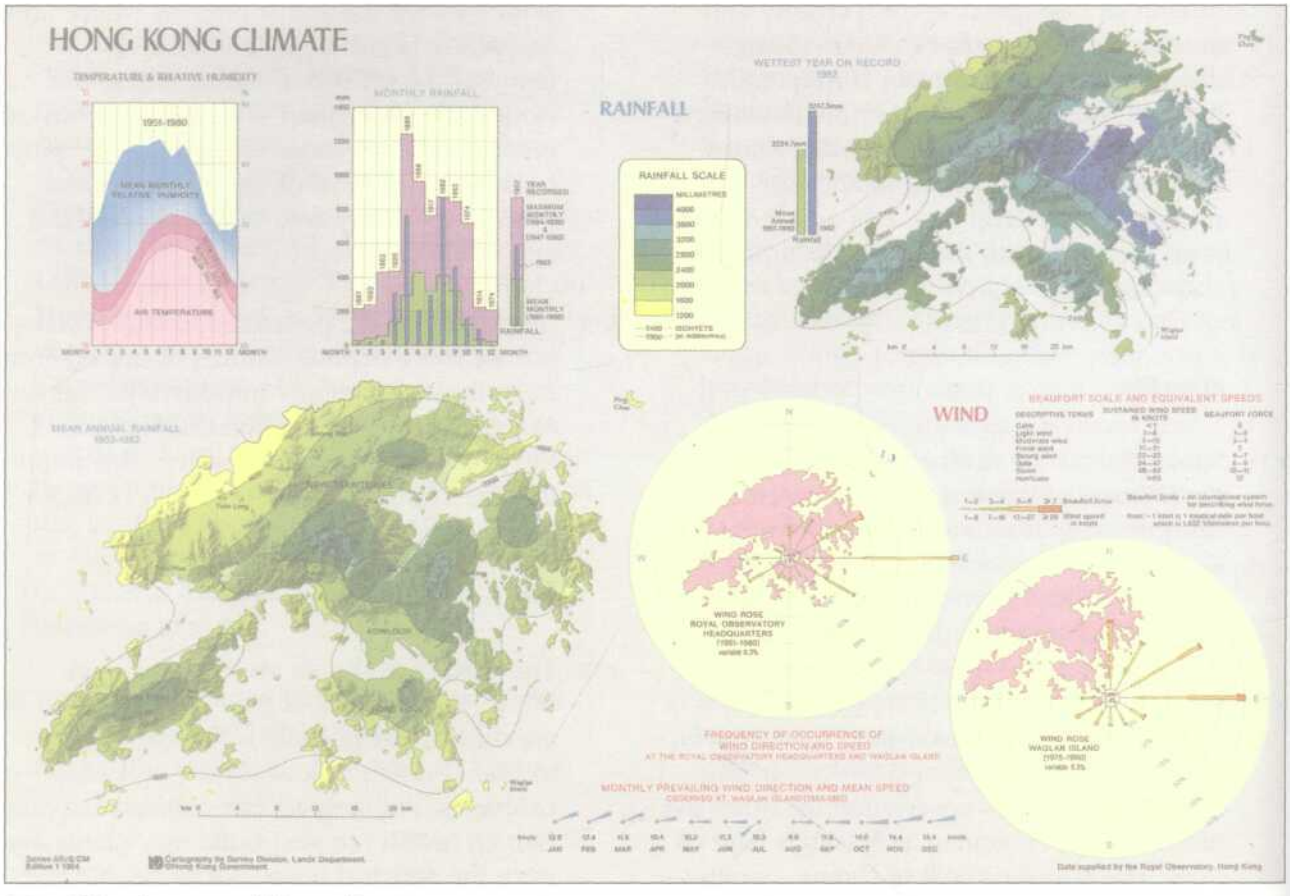
3.18 Important to the preservation and protection of these natural features of our environment (and particularly important to Mai Po Marshes) are two other crucial features of the ecosystem — air and water. This importance is examined in more detail in Chapter 5.

Air

3.19 The quality of the air we breathe — at home, at work and at play — is essential for good health, especially for those with asthma, bronchitis and similar breathing problems. Polluted air can damage not only human health but also buildings, plants and even the soil and water. Many people are exposed to undesirable levels of air pollutants emitted by different sources and of most concern are the high levels of particulates and nitrogen dioxide. Measurements indicate that nitrogen dioxide concentrations in areas with heavy traffic are breaching the Air Quality Objective (AQO) by about 15% to 20%. Particulates are generally high all over Hong Kong, especially in the urban areas, with the AQOs being exceeded by about 30% to 40% in areas with heavy traffic. Sulphur dioxide levels are generally within the AQOs, but there remain a few locations, close to industrial chimneys, where these are not being met.

Climate and the Environment

3.20 Levels of air pollution are also determined by the way the physical environment interacts with the meteorological conditions. For example, winds carry away pollutants, though tall buildings may create



3.4 Climate map of Hong Kong

wind traps which inhibit that effect. Sunshine causes hot air to rise and the resultant mixing with cleaner, higher air dilutes the concentration of pollution.

3.21 Summer in Hong Kong brings abundant rainfall, which helps wash pollutants out of the air, although the surface run-off washes pollutants into the rivers and sea. Air pollution in Hong Kong tends to be highest during early winter when winds are light and the air is dry and dusty. At this time anticyclones tend to suppress the vertical motion of the air and restrict the dilution effect of mixing different air streams.

3.22 But Hong Kong's micro-climate has been modified by the rapid urbanisation and industrialisation of the Territory. In recent years statistics suggest that, in the urban areas, temperatures have been increasing and visibility decreasing. This modification of the climate is worrying because it suggests that air pollution levels are not being effectively lowered by the natural ventilating effect of Hong Kong's climate.

Water

3.23 Water, a finite resource, is essential to human life. It is used at home, in industry and in agriculture; it is used for transport, fishing and recreation. Hong Kong is largely surrounded by water, and the central harbour is the focal point of the Territory. There are also six hundred rivers and streams in the New Territories, the water from which is used for domestic purposes, for irrigation, and for recreation. Although those marine waters support a diversity of marine life, sadly, most of our freshwaters are heavily polluted with domestic, industrial and livestock waste and support little or no animal life in the lower reaches. Although a substantial percentage of our

fresh water needs are met by purchases from China, due to increasing demand at source and predicted climate changes, Hong Kong must protect its own water catchments and conserve water.

The Sea

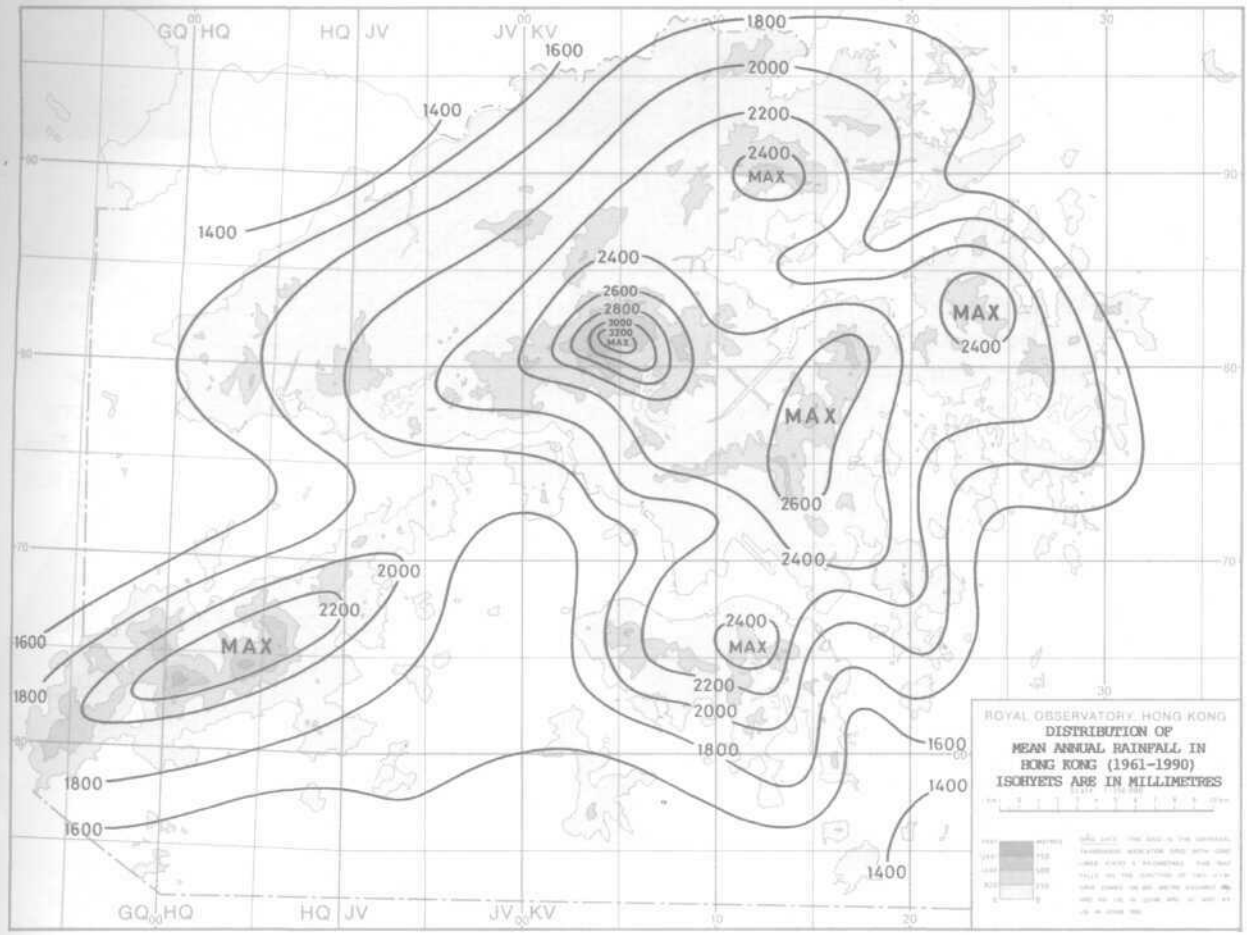
3.24 The sea surface area of Hong Kong is 1,827 square kilometres. Historically, the sea has been very important to the development of Hong Kong, whether as a large and sheltered anchorage, as a source of food, or as a highway for international shipping. Hong Kong is now one of the busiest ports in the world. Offshore areas have also assumed greater importance in recent years with an increasing number of activities taking place in the marine environment — building reclamations, laying immersed tube tunnels for transportation, laying pipelines and cables, and dumping marine mud or dredging marine sand as a valuable source of fill.

3.25 In more recent times the sea has also gained importance as a recreational resource, primarily for swimming, but also for other aquatic activities such as sailing, wind-surfing and scuba-diving. These activities do, of course, require that the aquatic environment is protected if the various uses to which we put it are to be sustained. Balancing these various requirements calls for careful management.

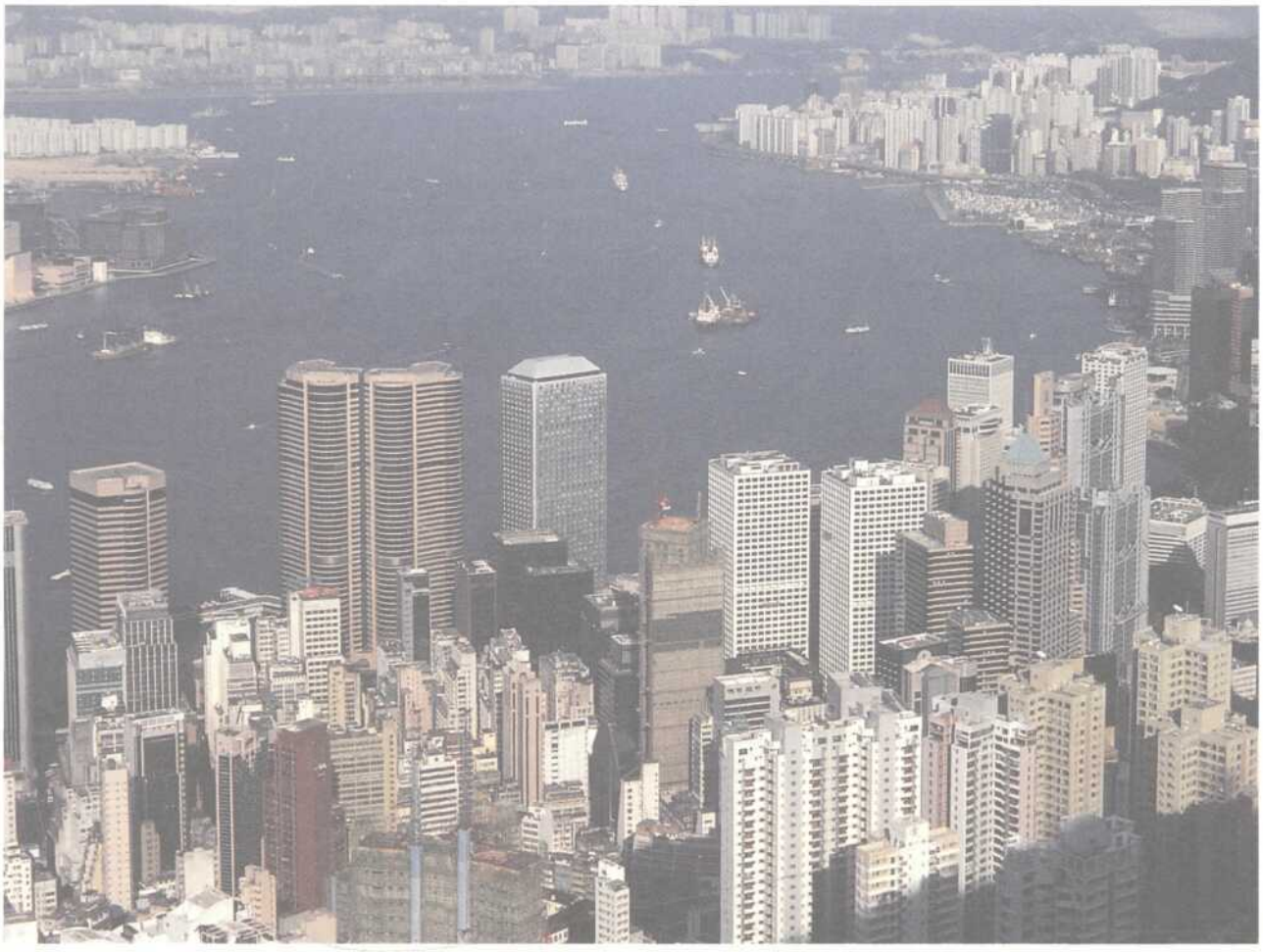
Marine Life

3.26 The Territory possesses a diverse variety of aquatic animals and plants with over 150 commercially important species of fish, crustaceans and molluscs. The types and quantities of aquatic life forms vary according to season and area.

3.27 The waters of Hong Kong can be divided



3.5 *Rainfall map of Hong Kong*



3.6 The harbour

into three sectors. Under the influence of the Pearl River, the biggest river in southern China, the western sector is predominantly brackish. The area to the east is more oceanic while the central sector is transitional between brackish and oceanic. In some areas, notably the Victoria Harbour and Tolo Harbour regions, pollution associated with recent rapid urban development has decimated the abundance and diversity of aquatic life. Nevertheless, various locations still serve as spawning and nursery grounds for many aquatic species, including food fishes, and these in turn attract transient predators such as mackerel, little tuna, sailfish and sharks. Eight species of dolphin, including the Chinese White Dolphin, and four species of whale have been recorded in Hong Kong waters and strandings occur quite frequently. The endangered Green Sea Turtle is also encountered in Hong Kong waters.

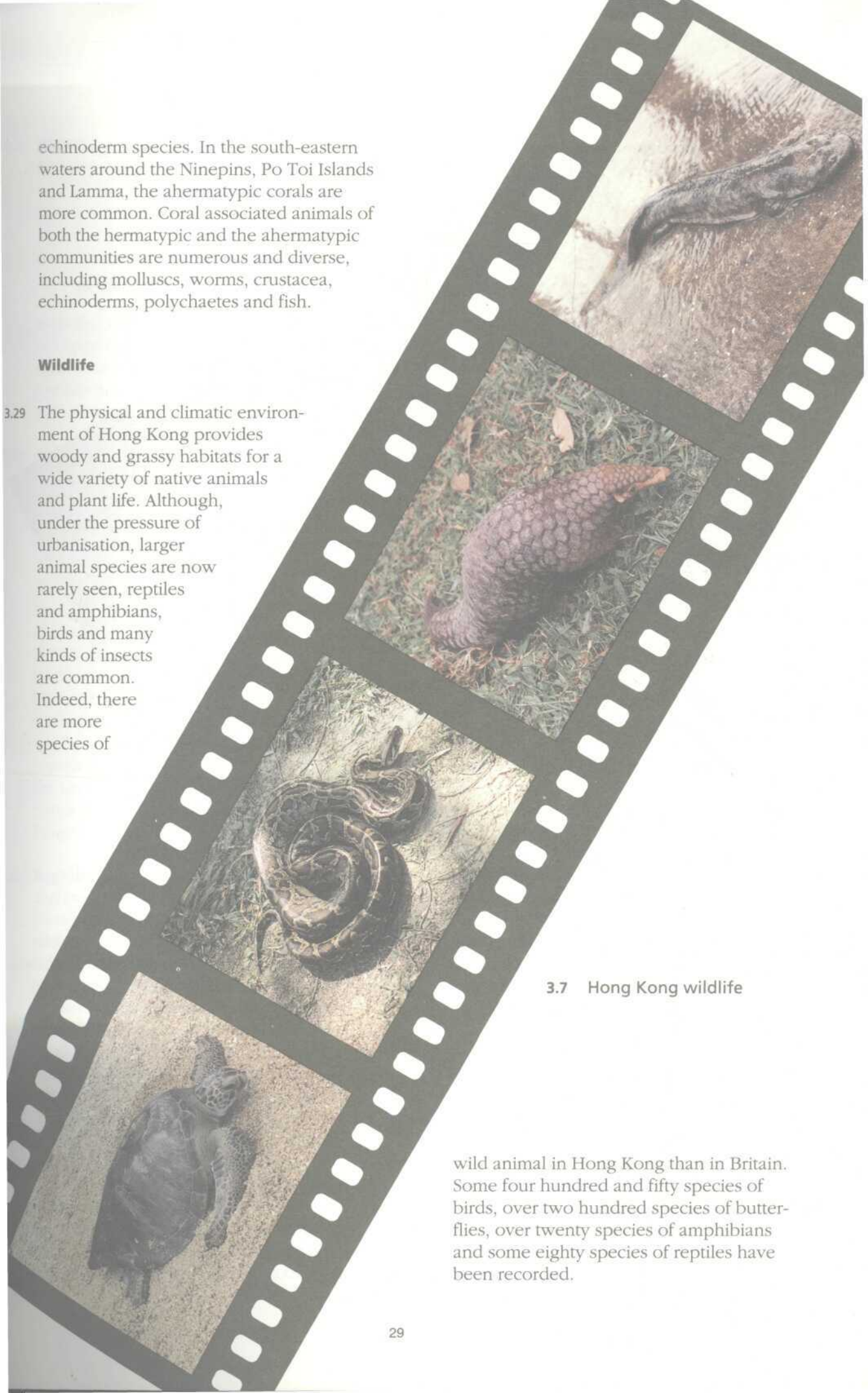
Corals

3.28 Hong Kong is almost at the northern limit for hermatypic corals (hard corals), of which there are about fifty species. The coral communities off the shores of Hong Kong have not been fully explored, though they are normally assembled into small subtidal reefs surrounding offshore islands, rarely extending to a depth of more than ten metres. On the eastern mainland their distribution is more patchy and they are generally restricted to headlands away from rivers and streams. The greatest variety, as well as the highest concentrations of coral, occurs in the sheltered northern waters of Mirs Bay (Double Haven and Crooked Harbour), Tolo Channel and Rocky Harbour, where the waters are not only saline and clear but warm and sheltered. Along with corals, these waters have a host of gastropod, bivalve, crustacean and

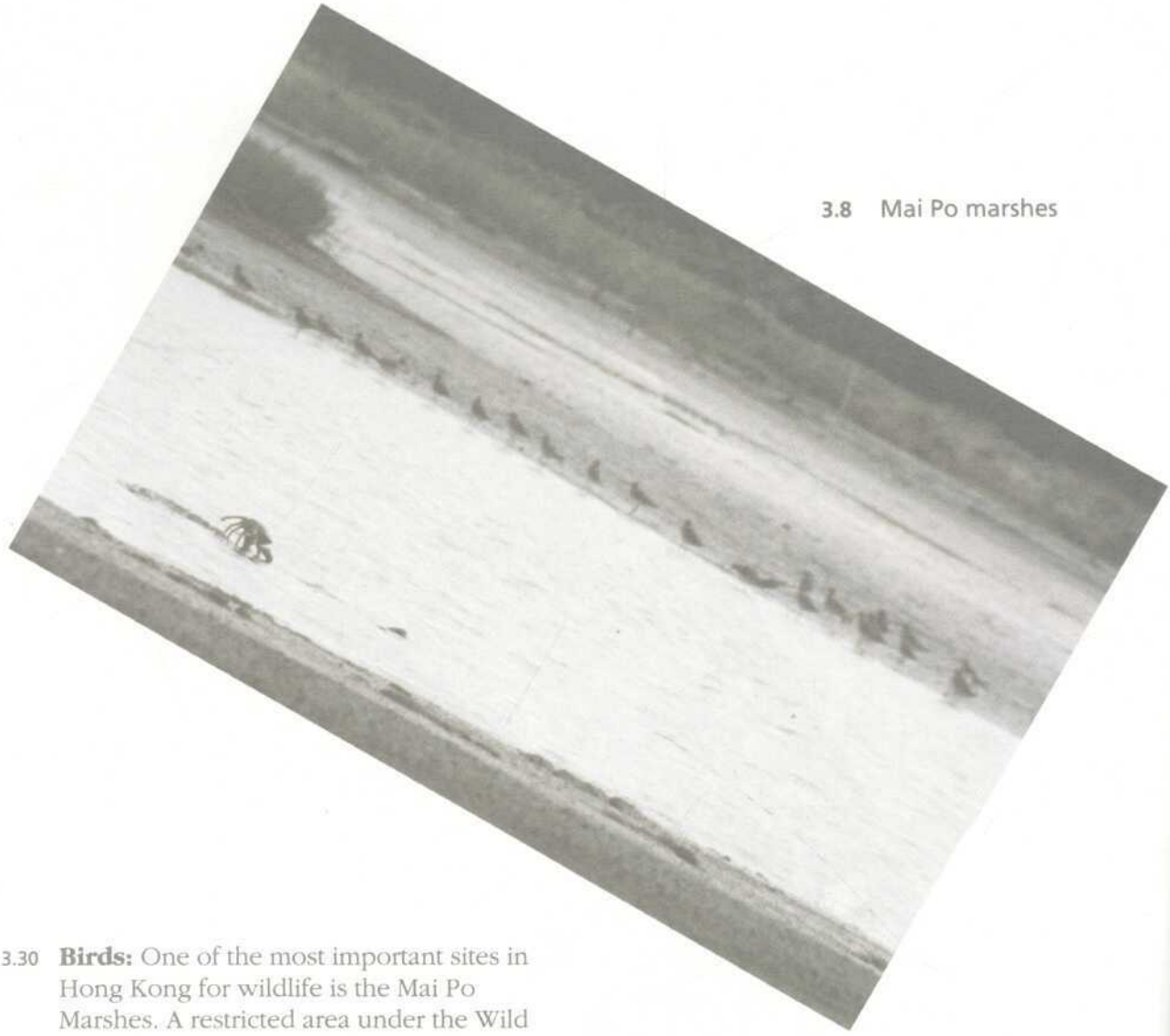
echinoderm species. In the south-eastern waters around the Ninepins, Po Toi Islands and Lamma, the ahermatypic corals are more common. Coral associated animals of both the hermatypic and the ahermatypic communities are numerous and diverse, including molluscs, worms, crustacea, echinoderms, polychaetes and fish.

Wildlife

3.29 The physical and climatic environment of Hong Kong provides woody and grassy habitats for a wide variety of native animals and plant life. Although, under the pressure of urbanisation, larger animal species are now rarely seen, reptiles and amphibians, birds and many kinds of insects are common. Indeed, there are more species of wild animal in Hong Kong than in Britain. Some four hundred and fifty species of birds, over two hundred species of butterflies, over twenty species of amphibians and some eighty species of reptiles have been recorded.



3.7 Hong Kong wildlife



3.8 Mai Po marshes

3.30 **Birds:** One of the most important sites in Hong Kong for wildlife is the Mai Po Marshes. A restricted area under the Wild Animals Protection Ordinance and managed jointly by the Agriculture and Fisheries Department and the World Wide Fund for Nature (Hong Kong), the Mai Po Marshes, together with inner Deep Bay, comprise a site of international importance, especially for migratory birds. Over fifty thousand waterfowl were present in Deep Bay in January 1993 which, with the Mai Po Marshes, is an essential feeding ground for migrant birds travelling between Siberia and Australia. Its 380 hectares of mudflats, shrimp ponds and mangroves provide a rich habitat, particularly for ducks and waders. These include over 1% of the world's population of four bird species — in the case of the Black-faced Spoonbill, more than 25% of the world's population winters at Mai Po. More than two hundred and fifty species of birds have been observed in this area, and at least 110 of them are rarely seen elsewhere in the territory. There are now some ten egretries which support six species — the Chinese Pond Heron, the Night Heron, the Cattle Egret, the Little Egret, the Great Egret and the Grey Heron nest there regularly. Occasionally the rare Swinhoe's Egret is also seen. Although traditional *fung shui* woods near the old villages and temples are increasingly affected by development, they continue to provide a very important habitat for many birds. Reported sightings in wooded areas include an assortment of warblers, flycatchers and robins.

3 3· **Bird Race** This diversity of birds is reflected in the annual Big Bird Race organised by the Worldwide Fund for Nature (Hong Kong) when dozens of teams scramble frantically around the Territory to see which team can count the largest number of bird species in 24 hours Well over four hundred species have been recorded in a wild state in Hong Kong and over one hundred and fifty species have been counted within 24 hours Team sponsorship funds are used to finance environmental protection at Mai Po Marshes

3 32 **Mammals:** Areas around the Kowloon reservoirs are inhabited by monkeys whose antecedents were released or escaped from captivity There are breeding groups of Rhesus Monkeys and a variety of hybrids Smaller mammals are common, with the Woodland Shrew, House Shrew and bats being numerous in some rural areas The Chinese Porcupine, with its strikingly-coloured black and white quills, is still present in parts of the New Territories and Hong Kong Island and it is not unusual for walkers in country parks to come across ejected quills Occasional sightings are also reported of less common species such as the Leopard Cat, two species of Civet Cat, Ferret Badger, two species of Mongoose, Pangolin, Barking Deer and Wild Boar

3 33 **Reptiles and Amphibians:** Snakes, lizards and frogs are plentiful in Hong Kong and there are various species of terrapins and turtles The Green Turtle is occasionally sighted and there have been reports of it laying eggs on some local beaches Amphibians of special interest are the Hong Kong Newt, Romer's Tree Frog and the Hong Kong Cascade Frog, which have not been recorded elsewhere in the South-east Asian region A new species of legless lizard has been discovered on Hei Ling Chau

3 34 **Romer's Tree Frog** A tiny frog with an average length of 1 5cm and a maximum of 2cm, Romer's Tree Frog is a very rare species thus far only found in Hong Kong It was first discovered in 1952 in seepage pools in a cave on Lamma Island It is found on Chek Lap Kok where due to the airport project, a special conservation exercise has been mounted to protect it To begin with it was listed as a protected wild animal under the Wild Animals Protection Ordinance Frogs were also collected from Chek Lap Kok and bred in laboratories at the Hong Kong University and the Royal Melbourne Zoo A study is being undertaken to understand the needs and habits of the species and to release the frogs to the wild A field search has revealed that the species also exists in some other rural parts of the Territory

3 35 **Insects:** There are more than two hundred recorded species of colourful butterflies These include the two commonly found species of Cabbage Whites, the Swallowtails, and the beautiful but less common Small Blue and the rare Birdwing Butterfly Among the many local moths are the giant silkworm moths, including the Cynthia, Fern, Atlas and Moon The Atlas has an average wing span of 23 centimetres and the Moon, 18 centimetres

3 36 Of the local plant bugs, two are especially noted for their colour and shape They are the rare and beautiful Spotted Tea Bug, which has been recorded only on hilltops, and the Lantern Fly which has delicately coloured wings and a remarkably long head Dragon and damsel flies are common, as are wasps and metallic-coloured beetles One specie of dragonfly, previously unknown to science, has been recorded in the Sha Lo Tung Valley and another at Tai Tong Of particular interest is the giant Red-Spotted Longhorn Beetle which feeds on the Mountain Tallow and Wood-Oil trees Many other species of longhorn beetles infest living or weakened trees, including citrus and pine

Country Parks

3 37 Hong Kong has 21 country parks covering nearly 40% of the Territory's land area This is a higher percentage of land devoted to parks than anywhere else in the world The

parks are designated for nature conservation, countryside recreation and outdoor education. They are therefore a protected home for the wide variety of plant and animal life found in Hong Kong. The country parks are also an increasingly important recreational outlet for our otherwise crowded community, and some ten million people visited them in 1992. Apart from country parks, areas worthy of conservation are also designated as special areas, Sites of Special Scientific Interest (SSSI), green belts, countryside conservation areas and coastal protection areas.

Antiquities and Monuments

3.38 Any synopsis of the environment, and any programme of conservation, should also touch upon the position of physical structures, such as antiquities and monuments, because they are also an important part of our heritage. Although such structures are not a part of the natural environment, many people still obtain considerable pleasure from their preservation and they can, in no small way, contribute to the enjoyment of our environment. These structures are, of course, also subject to the effects of pollution.

3.39 It is clear from these brief descriptions of Hong Kong's natural environment that we have a varied and diverse environment set in an unusual and beautiful topography. Surely, it is an environment worth protecting not just for ourselves, but for our children and future generations. Chapters 5 and 6 therefore look in more detail at the measures we have already taken to protect our diverse environment. First, however, Chapter 4 proposes the adoption of certain principles when considering how best to conserve that environment.

CHAPTER 4

PRINCIPLES FOR PROTECTING OUR ENVIRONMENT

4.1 Most environmentalists now believe that the pressures which mankind has placed upon the global environment have reached a level where urgent action is necessary if that environment is to support future generations. This is certainly true of Hong Kong — the government has therefore been implementing a broad range of legislative controls to protect the environment and, as explained in Chapter 6, more such legislation will be required in future. However, as we shall see in Chapter 5, some areas of our environment remain under severe threat, and many environmental standards cannot be met because of the excessive pollution associated with our current life-styles.

4.2 To forge policies and programmes that will overcome this pollution and that will properly protect our environment for ourselves and for future generations so that they can meet their needs from it, will require our community, as communities elsewhere are also required, to make lifestyle changes. That is, changes to the way we do business, the way we purchase goods — whether as industrialist or housewife — changes to the way we travel and play, and changes to how we learn at school and live at home. It is only when these changes are accepted, and acted upon broadly within the community, that we will be embarked on a lifestyle that will not excessively harm the environment. Only then will we be able to enjoy the rights of clean air and water, and the right to enjoy the countryside without harming its beauty or interfering with its tranquillity. Only then will we be in a position to fulfil our obligations of stewardship so that future generations can also meet their needs from our environment.

Ten Foundation Stones

4.3 This Chapter will therefore set down certain principles for which it will be necessary to strive if these objectives are to be achieved, and our moral obligations fulfilled. Clearly, it is important for the community to first understand and accept these principles before it can act upon them. Ten such principles are proposed here, each one a foundation stone on which to build a cleaner, healthier Hong Kong. In Chapter 10, straightforward guidelines are set out on how everyone can turn these principles into action.

4.4 **Stewardship**. We have already addressed this issue in chapter 3. Whilst no official definition exists, stewardship may be

defined simply as *the responsibility of every community to ensure the proper protection of the environment so that the objective of sustainable development can be achieved.* This is an ethical and moral responsibility that must not be shirked for the benefit of short term gain. We should therefore agree, as a community, to take responsibility for our own environment now, to ensure that environmental degradation is halted, and that programmes for protecting and sustaining our environment will become a feature of community activity.

4.5 **Sustainable Development**. The World Commission on Environment and Development (headed by the then Norwegian Prime Minister Gro Harlem Brundtland) chose sustainable development as the central theme of its report, *Our Common Future.* In the report, sustainable development is defined as *development or progress that meets "the needs of the present without compromising the ability of future generations to meet their own needs".* The United Nations Conference on Environment and Development (the "Earth Summit" at Rio de Janeiro in June 1992) accepted this definition. Communities are therefore obliged to review objectively all their development programmes to ensure that they are compatible with the principle of sustainable development. This is a major challenge. The significance of this challenge is illustrated by the need for energy conservation (Chapter 8). If we are to conserve energy (and Chapter 8 shows that we must) we will have to challenge the very basis of our prosperity — the use of cheap and abundant fossil fuels. This will require significant changes to our lifestyles. Whether the community (locally and internationally) is prepared to sacrifice an element of material prosperity for the sake of sustainable development is perhaps the key challenge we must face before we enter the twenty-first century. (The difficulties of embracing sustainable development policies will be considered further in Chapter 9 (Hong Kong and Global Goals) which looks at the Agreements and Conventions arising from the 1992 Earth Summit).

4.6 **Community Responsibility**. *Responsibility for environmental action is not a responsibility for government alone, but an obligation on every member of the community, whether as an individual or part of a group.* While governments everywhere will need to take a lead in environmental protection, if the very broad objectives of environmental protection are to be achieved — and if we are to fulfil the objectives of stewardship and sustainable development — then every responsible member of the community must play a role. In Hong Kong, public opinion surveys clearly indicate those issues which are consistently at the forefront of the community's concerns. Those issues are housing, education, the economy, law and order, transport and the future. The environment is rarely, if ever, identified as a community concern. This must change.

4.7 **Public Information**. *Information about our environment should be made readily available so that the public can make informed choices.* Clearly, if members of the public are to become more involved in community-wide responsibilities for environmental protection they must have the necessary information on which to act. The government will therefore take steps to make such information more readily available. But members of the public should themselves take steps to obtain such information and not rely entirely on government or others. (As illustrated in Annex B, a substantial amount of information on our environment is already available.)

4.8 **Realistic Approach**. *Measures to protect the environment should be based on the most reliable information available, on wide public debate of the measures, and on the understanding that in many cases essential goals will not be easily achieved.* Years of neglect and environmental degradation cannot be reversed overnight or without cost, to both the public and private purse. Even so, there is a need to expedite a broad range of environmental programmes. To assist the public in understanding these problems, and in debating the measures

necessary to overcome them, the government undertakes to increase the information about the environment made available to the public.

4.9 **Precautionary Principle**. *Believing that prevention is better and cheaper than cure, we should take action to protect the environment against pollutants even when scientific evidence may not wholly confirm such action.* This is the position, for example, concerning global warming. Whilst scientific opinion is divided over the contributory causes to this phenomenon and the weight that should be given to individual contributors, all are agreed on one thing — the *effects* of global warming are such that delaying any action until all the scientific aspects of the phenomenon are understood could be disastrous to the global environment.

4.10 **Regulation**. Given the very high density of development in Hong Kong, and the lack of proper planning in the past, stringent pollution control legislation and strict enforcement are necessary. *Necessary regulations to prevent and control pollution are therefore being introduced and properly enforced.* While the basis for abating pollution in Hong Kong has, to date, been of the "command and control" variety, the government will continue to explore other measures that may prove more flexible or efficient in achieving environmental objectives.

4.11 **Polluter Pays Principle (PPP)**. *Those who cause environmental damage should pay for the costs of that damage, without subsidy, and should seek to curtail such damage by internalising the costs of pollution.* The government will therefore seek to extend this principle so that environmental objectives can be met and so that, gradually, the community makes a fair and reasonable contribution to the cost of providing services necessary to protect the environment. (see Chapter 11).

4.12 **International Cooperation**. *As a community, we will endeavour to meet our obligations under international agreements and treaties aimed at preventing global pollution and conserving natural resources.* Hong Kong is a sophisticated, modern city, one of the most popular tourist venues, and generates an economy listed as the tenth richest in the world. Clearly, we have a responsibility to meet environmental obligations that are consistent with our status in the world community.

4.13 **Private Sector Involvement**. *The government believes that the private sector is, for the most part, best placed to provide the facilities needed to clean the environment, subject to detailed requirements to be decided and enforced by appropriate authorities.* In addition, and where appropriate, market forces should be allowed to play a role in helping to clean and protect the environment. Economic instruments, such as tradeable permits, can also be considered, subject to their appropriateness in Hong Kong's circumstances.

4.14 To meet our environmental obligations we will need to fulfil these principles. They are therefore commended to the community. That it is necessary for the community to take these principles to heart is evident from the next two Chapters, where we look in more detail at the stresses on our environment and the measures that are necessary to relieve those stresses and to provide for its long term protection.

STEP 2

PROTECTING OUR ENVIRONMENT

CHAPTER 5

OUR NATURAL ENVIRONMENT: WORTH PROTECTING

5.1 The overview of Hong Kong's environment in Chapter 3, illustrated that the Territory has a rich and diverse environment comprising natural assets and resources that one would not expect for a territory that has been described as a "barren rock" or, more recently, as a "concrete jungle" or a "massive, never-completed building site". This Chapter will describe the measures in hand to conserve these valuable natural resources.

Conservation Policy

5.2 Our present conservation policy has evolved over many years. In simple terms, it seeks to conserve and enhance our natural environment by protecting existing conservation areas and heritage features, by identifying new areas for such conservation, and by compensating for areas which merit conservation but which are inevitably lost to essential development projects.

5.3 The key features of our current conservation strategy are:

(a) to identify, designate and manage areas of conservation value;

(b) to maintain biological diversity through the protection of flora and fauna and, where appropriate, to increase the population of endangered plants and animals;

(c) to rehabilitate degraded landscapes;

(d) to provide opportunities for people to appreciate the natural environment and our cultural heritage;

(e) to promote conservation education and public awareness of conservation;

(f) to cooperate with non-government organisations to promote conservation, and to carry out research and surveys which support conservation;

(g) to put in place the necessary legal and administrative framework; and

(h) to allocate resources for conservation purposes and to coordinate conservation activities.

5.4 A legal framework to achieve these objectives has been put in place. This Chapter outlines existing conservation measures while Chapters 7 to 11 present a more forward-looking approach to conservation

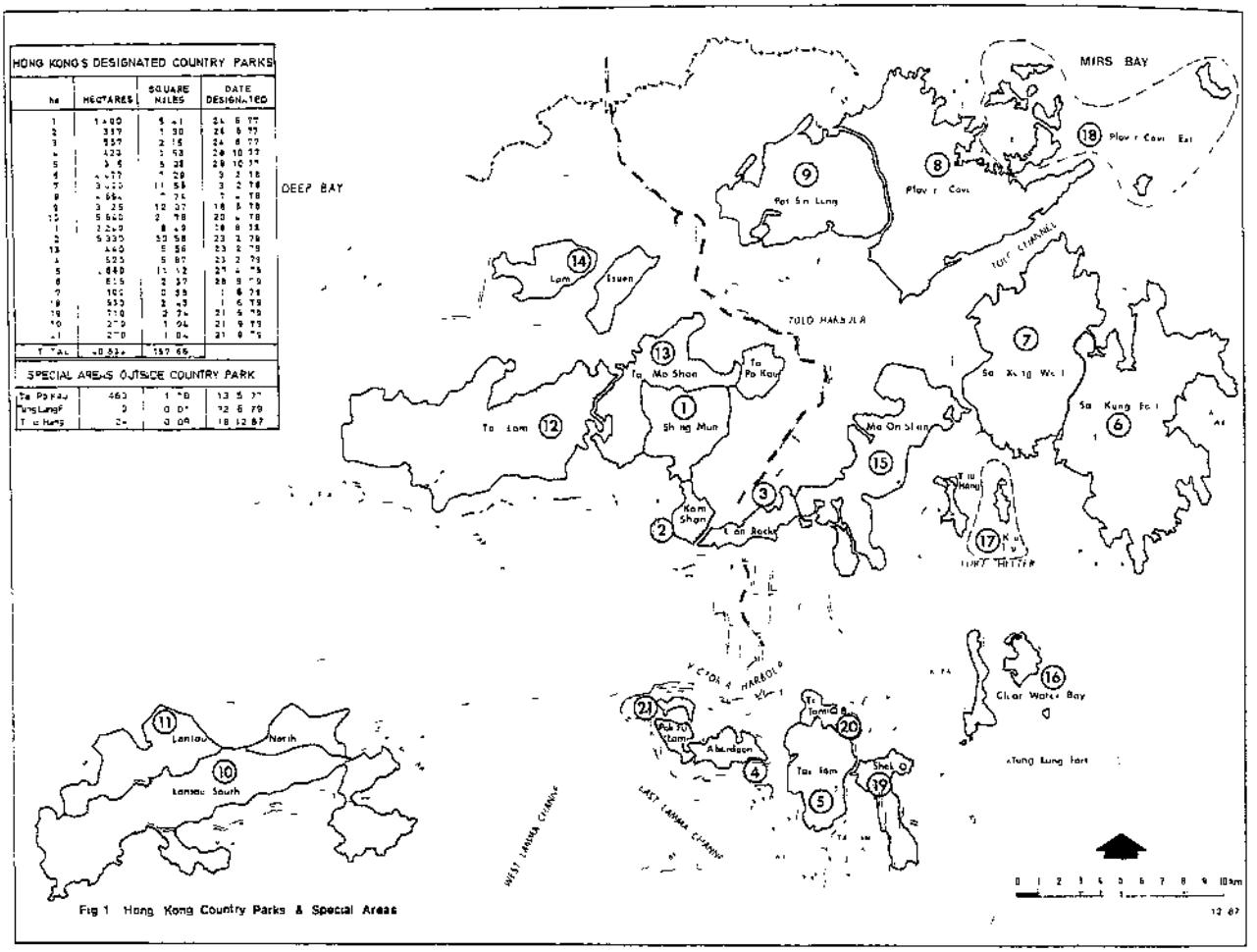


Fig 1 Hong Kong Country Parks & Special Areas

5.1 Country parks and special areas

and take into account the new objective of sustainable development (paragraph 4.5).

Country Parks

5.5 Country parks and special areas are designated for the purposes of nature conservation, countryside recreation and outdoor education. A total of 21 country parks and 14 special areas have been established, covering an area of 41,320 hectares, or about 40% of the land area of Hong Kong. Vegetation management is carried out in country parks and special areas for conservation purposes and some 300,000 trees a year are planted in them.

5.6 The Country Parks Ordinance (Cap. 208) was enacted in 1976 to provide a legal framework for the designation, development and management of country parks and special areas. It provides for the establishment of a Country Parks Board to advise the Country Parks Authority (the Director of Agriculture and Fisheries) on all matters relating to country parks and special areas.

5.7 The facilities provided in the parks include picnic sites with tables and benches, barbecue pits, children's play apparatus, shelters, campsites, toilets and litter bins — all carefully designed to blend in with the natural environment. Footpaths, family walks and nature trails provide easy access to the hills and woodlands to enable visitors to enjoy the scenic beauty of these areas. Care is also taken to provide recreational facilities — popular with the majority of visitors to country parks — which are sited to ensure that the more fragile conservation zones are properly protected.

5.8 Increasing emphasis is now being given to

countryside education. Six visitor centres have been established at Aberdeen, Tai Mei Tuk, Pak Tam Chung, Tai Hang Tun, Shing Mun and Tai Mo Shan. The Lions Nature Education Centre at the Tsiu Hang Special Area in Sai Kung, which consists of a rich collection of fruit-bearing and amenity trees, has also been developed into a nature education centre. Guided walks are also organised for schools and other organised groups.

5.9 Although about 40% of Hong Kong's land area is designated for country parks, the opportunity is taken to extend the boundaries of the country parks whenever possible. There are plans to extend the boundaries of the existing country parks and to designate more scenic areas as country parks at Lung Fu Shan, Tai Tong and Wan Tsai Peninsula. These measures will provide an additional 194 hectares of land to be protected by the Country Parks Ordinance.

Restricted Areas

5.10 Under the Wild Animals Protection Ordinance (Cap. 170), two important wildlife habitats — Mai Po Marshes and Yim Tso Ha Egretry — are listed as restricted areas and access to them is restricted to holders of permits issued by the Director of Agriculture and Fisheries. Incompatible development proposals in these areas are not entertained.

5.11 The Mai Po Marshes in particular is an area of international importance to wildlife. Its extensive mangrove formations support a rich diversity of wildlife and it has an important role as a stopover and refuelling station for tens of thousands of migratory birds. Mai Po Marshes is regarded as the most important nature reserve in Hong Kong.

5.12 The World Wide Fund for Nature (Hong Kong) develops and manages the Mai Po Marshes for conservation and education purposes. It has set up a wildlife education centre and a study centre, and regularly organizes guided walks for school children and members of the public — over 30,000 people visit the reserve each year. The government is responsible for maintaining restricted access to the nature reserve, conducting regular patrols, taking enforcement action to curb abuses, controlling incompatible development in or around the area and, under the Water Pollution Control Ordinance (Cap. 358), controlling pollution in Inner Deep Bay.

5.13 To protect further this important nature reserve, government plans to clear 115 hectares of shrimp ponds within the Mai Po Marshes over the next few years and hand them to the World Wide Fund for Nature (Hong Kong) for management. Government also aims to extend the boundary of the restricted area to cover that part of Inner Deep Bay adjacent to the Marshes.

5.14 **The Ramsar Convention**: The object of this Convention is to promote the conservation and wise use of wetlands and to designate for special protection wetland areas of international importance, especially as a waterfowl habitat. The government's current position on whether the Mai Po Marshes should be designated under the Convention is that the issue will be considered in the overall context of development and conservation strategies for the North-West New Territories. A review of the Development Strategy for this area is being carried out by the Planning Department and will be completed by early 1994. A decision on including Mai Po Marshes under the Ramsar Convention will then be made.

Buffer Zones

5.15 Buffer zones are planning measures to give added protection to important wildlife habitats by protecting the areas that surround them and by preventing them from becoming isolated islands of natural habitat amidst building developments. Buffer zones therefore help prevent any disturbance or loss of mud-flats, natural habitats, fish ponds and arable land which are vital for

sustaining the wildlife in the area. The first buffer zones have been established around Inner Deep Bay and are taken into consideration when applications for development are placed before the Town Planning Board

Sites of Special Scientific Interest (SSSIs)

5.16 The creation of SSSIs is an administrative device, without legal backing, to ensure that government departments are aware of the scientific importance of such sites and to ensure that they give due consideration to conservation when developments in or near these sites are proposed. SSSI proposals are coordinated by the Director of Agriculture and Fisheries. At present, there are 49 SSSIs and these include the Mai Po Marshes, Yim Tso Ha Egretry and 23 SSSIs inside country parks. In considering whether a site should be recognised as an SSSI the site, or its features, will be assessed on the following criteria:

- its uniqueness, naturalness or rareness in a Territory-wide context
- its scientific value in a territorial or regional context
- whether it is representative or typical of its kind.

Other factors for consideration include the present protection status, the land status and the urgency for listing the site as an SSSI. The adequacy of these arrangements is now being reviewed.

Rural Areas

5.17 In 1989, the government adopted the **Rural Planning and Improvement Strategy** which, through a planning and administrative framework to guide development and the provision of essential infrastructure and amenities, aims to improve the general environment of the rural areas in the New Territories. Over a ten year period from 1990/91, $4 billion will be made available to improve flood protection measures, access and sanitation for these rural areas, to form sites for village expansion and rural community facilities, and to provide infrastructure to upgrade the general environment of temporary residential and industrial areas in the New Territories.

5.18 Uncontrolled development has proliferated in some rural areas and this had led to extensive degradation of the rural environment. To help counter this trend, the scope of the Town Planning Ordinance was extended to cover the rural areas from July 1991. Under this Ordinance, plans for 35 Development Permission Areas (DPAs) have been published to provide interim planning control while detailed Outline Zoning Plans (OZPs) are prepared. The benefits of the application of DPAs are several. Proposals for new developments within these areas are now scrutinised to ensure that they are compatible with the surrounding environment and planning intention. Unless otherwise exempted by the DPA plans planning permission is required before new developments can proceed. Enforcement action can also be taken to prevent any illegal change of existing land use adversely affecting the environment. Meanwhile, 51 OZPs are being prepared for these areas to provide a better framework for transport, land use and environment planning. The great majority of the OZPs are scheduled for completion in mid 1994.

5.19 Despite these measures, there is no doubt that much visual pollution in the New Territories remains. We therefore propose to establish task-forces comprising representatives from several government departments. Their task will not be easy — to clean up the New Territories' over the next ten years.

Flora and Fauna

5.20 Hong Kong's valuable flora and fauna is protected through conservation legislation.

For example, the Country Parks Ordinance (Cap. 208) also protects the flora and fauna within the parks. The Forests and Countryside Ordinance (Cap. 96) protects forests, plantations and valuable plants Territory-wide. The Animals and Plants (Protection of Endangered Species) Ordinance (Cap. 187) restricts the import, export and possession of endangered species and their readily recognisable parts and derivatives in accordance with the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (see paragraph 9.28). The Wild Animals Protection Ordinance (Cap. 170) gives full protection to local wildlife by prohibiting hunting, and by prohibiting the possession, export or sale of protected wild animals. It also empowers the Governor to list any area as a restricted area under the Sixth Schedule of the Ordinance.

5.21 The Agriculture and Fisheries Department manages the Hong Kong Herbarium and two arboreta which, with the Botanical and Zoological Gardens managed by the Urban Services Department, provide *ex-situ* conservation areas for local and exotic wildlife. The Agriculture and Fisheries Department has also successfully propagated and replanted wild local species which are considered rare internationally, such as *Camellia crapneliana* and *Camellia granthamiana.*

Marine Parks and Reserves

5.22 To protect and manage ecologically important marine environments in Hong Kong for conservation, education and recreation purposes, the government plans to establish marine parks and reserves. In the initial phase, the designation of three sites is planned — Cape d'Aguilar, Hoi Ha Wan and a portion of Yan Chau Tong and Kat O Hoi.

5.23 The government will propose new legislation to establish a Marine Parks Authority to provide for the designation, management and development of marine parks and marine reserves and to make regulations for the control of activities in these areas. Artificial reefs could be placed in these areas to enhance the marine environment and aquatic life. The Director of Agriculture and Fisheries would be the Marine Parks Authority and would be advised in the discharge of these responsibilities by the Country Parks Board.

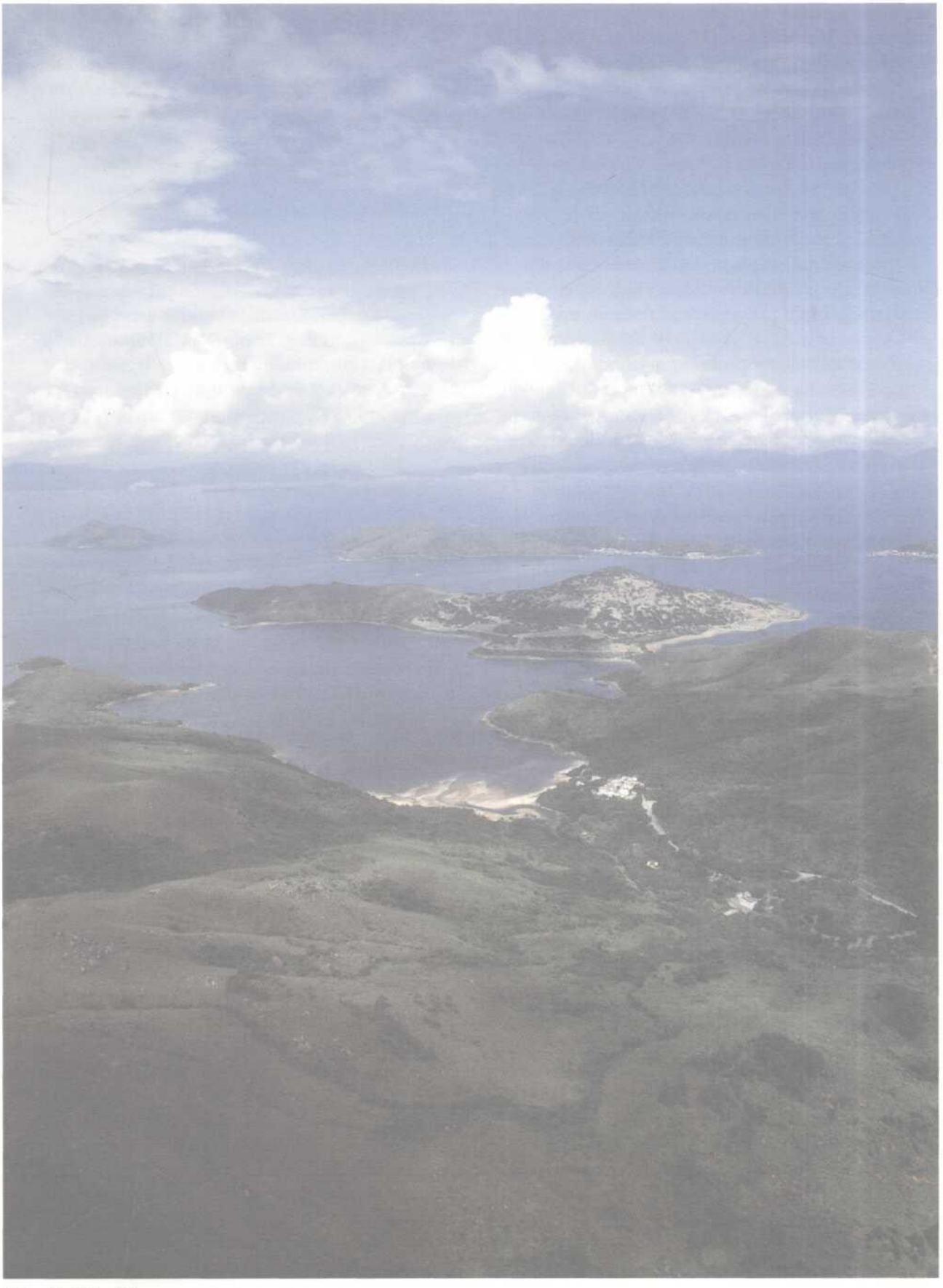
Greening and Landscaping

5.24 Tree planting, greening and landscaping play an important role in preserving our natural environment and improving its visual quality. Some 900,000 trees are planted annually by the Agriculture and Fisheries Department, the Territory Development Department, the Housing Department, the Water Supplies Department, the Municipal Councils, the District Boards and the green groups.

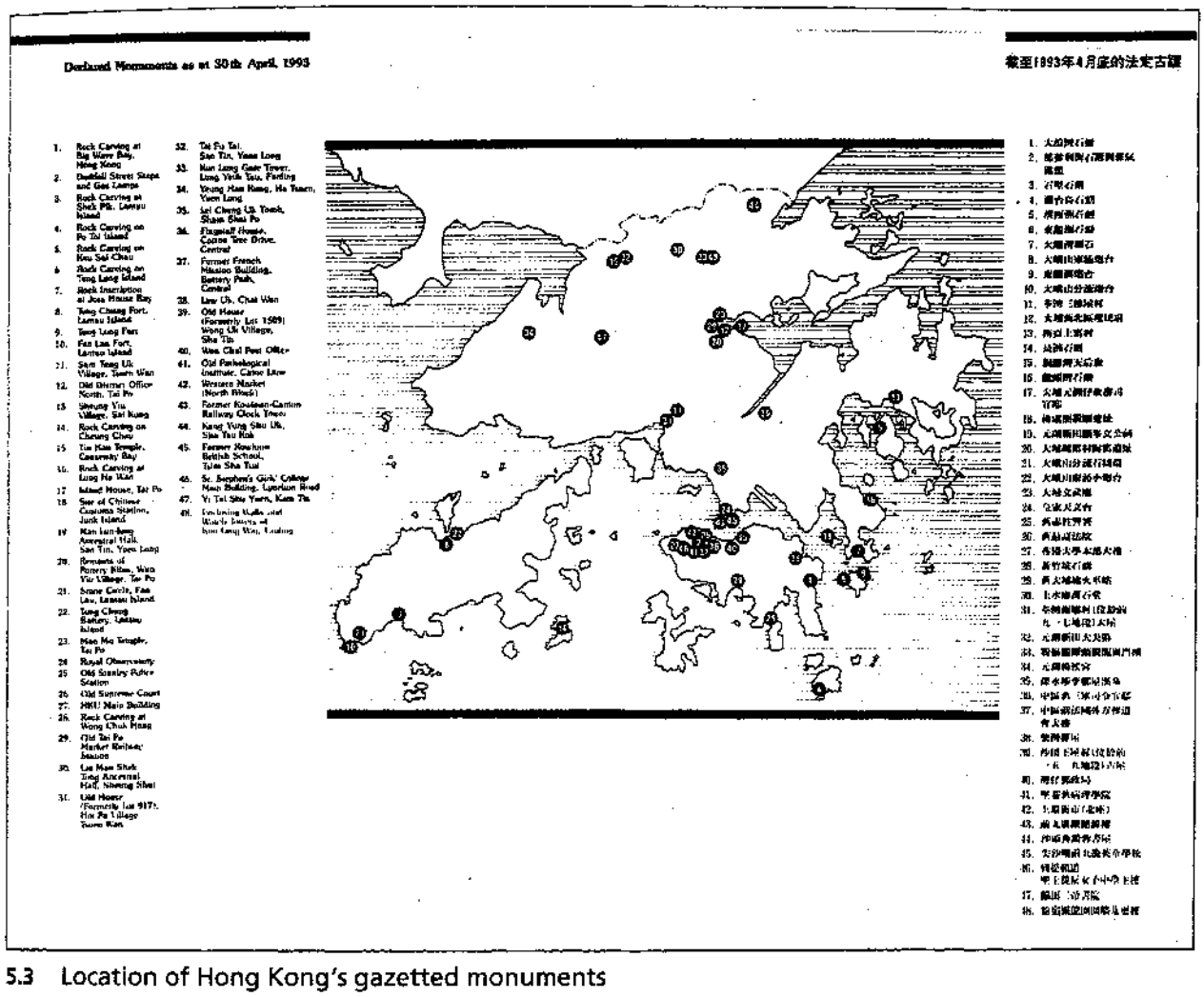
5.25 In future, greater effort will be directed towards the greening of the urban areas and the urban fringe to mitigate the concrete jungle image of Hong Kong, for example, the green campaign launched by the Urban Council in May 1993 and supported by government departments and green groups. In addition, the Territory Development Department proposes a long term comprehensive landscape plan to develop 15 areas as urban fringe parks, and an urban fringe planting programme which envisages 1,000 hectares of green and landscaped open space in the main urban areas. Work has also started on drawing up an urban forestry strategy and an information paper on this strategy will be released for public discussion in 1994.

5.26 On the territorial level, a landscape conservation strategy is being formulated under the current Territorial Development Strategy Review. The object of this strategy is to conserve and enhance significant landscape. A broad landscape framework is being developed along the lines of the map at Annex C, to guide the planning and design of new landscape in the formulation of the strategy.

5.27 Quarry rehabilitation is, among other



5.2 Hoi Ha Wan



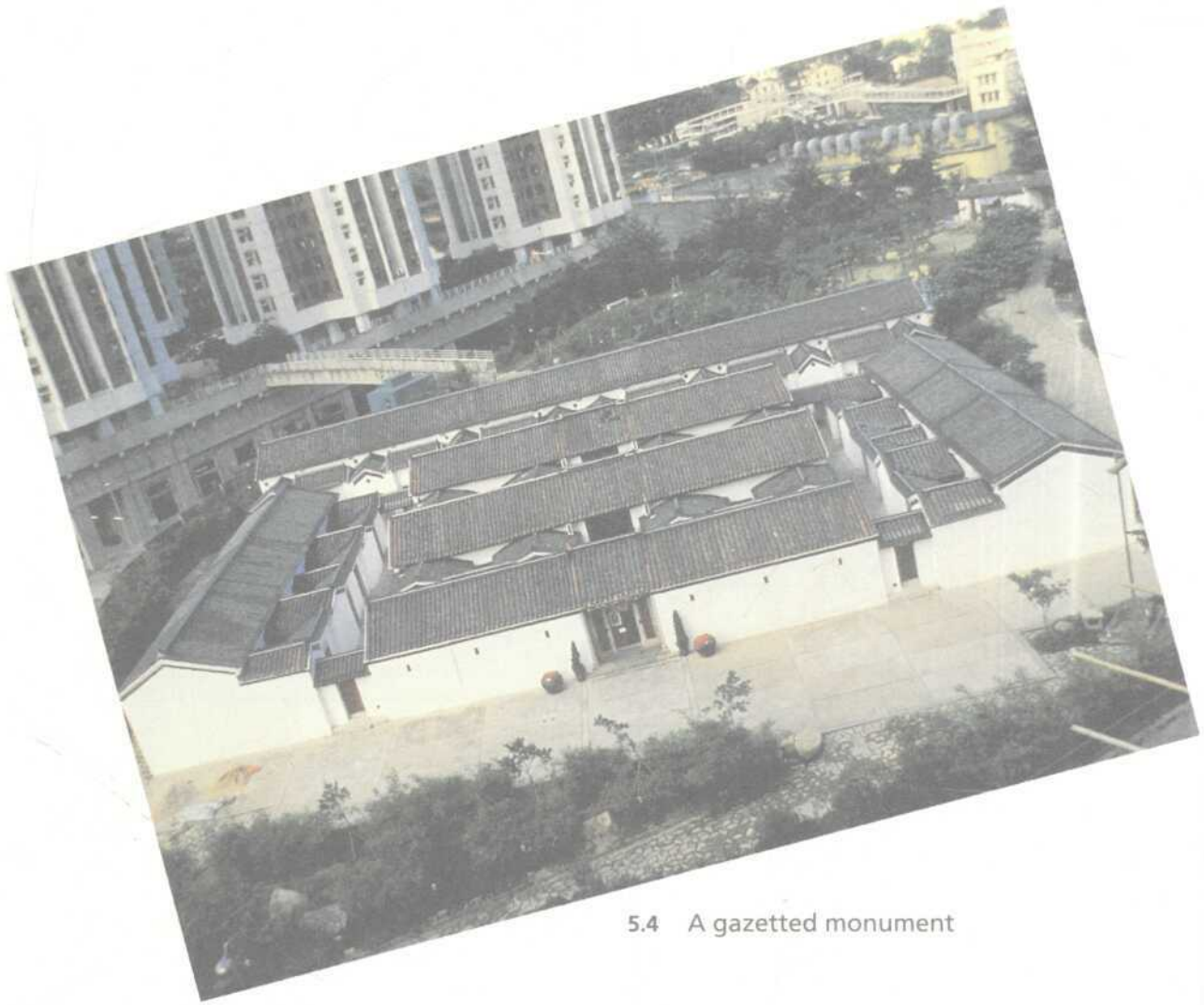
5.3 Location of Hong Kong's gazetted monuments

purposes, another important area of visual improvement. The general aim is to cut back and regrade the existing quarry slopes to enable satisfactory revegetation. Rehabilitation plans for quarries at the Anderson Road, Mount Butler, Shek O and Lamma are now being formulated to gradually restore these areas over the next ten to twenty years and to mitigate the prominent visual impact they have on the environment. The programmes for landfill restoration (paragraph 6.84) will also contribute to visual improvement.

Antiquities and Monuments

5.28 Heritage conservation embodies the protection of antiquities and monuments and, in a wider sense, the activities and lifestyles which are unique to a particular locality. The Antiquities and Monuments Ordinance (Cap. 53) provides for the preservation of objects of historical, archaeological and palaeontological interest. The ordinance provides for an Antiquities Advisory Board, to advise on matters relating to preserving our heritage, and an Antiquities Authority, the Secretary for Recreation and Culture, to preserve and protect the cultural heritage of the Territory. The Antiquities and Monuments Office acts as the executive arm of the Authority.

5.29 The approach to heritage conservation is four-fold. First, items considered worthy of preservation are identified and recorded so that consideration can be given as to how they should be protected. Second, historical items to be protected are, where appropriate, restored and protected from redevelopment or deterioration. Third, archaeological



5.4 A gazetted monument

resources are protected and conserved and a licence from the Authority is required before any excavation or antiquities search is conducted, thus ensuring that excavations are performed scientifically and that a full record of any antiquities uncovered is maintained for future reference and research. Fourth, public awareness in heritage conservation is promoted. Publicity and education programmes are devised to encourage more people to develop and sustain an understanding and interest in the past.

5.30 In recent years, measures to conserve our heritage have gathered pace. For example, in 1992 four historical buildings were declared historical buildings to be preserved under the Antiquities and Monuments Ordinance (i.e. the St. Stephen's Girls' College on Hong Kong Island and the Yi Tai Shu Yuen in Kam Tin — the earliest historical settlement in the Territory). The Antiquities Advisory Board also examined a number of pre-war schools, lighthouses and law court buildings, and graded them in accordance with their historical significance or architectural merit. Several major restoration projects were also satisfactorily completed in 1992 (e.g. the Hau Kui Shek Ancestral Hall at Ho Sheung Heung).

5.31 In 1993 work is continuing on a comprehensive inventory of all historical buildings and structures in Hong Kong, on further work to declare additional monuments as historical buildings (e.g. the Helena May on Hong Kong Island, the Kun Ting Study Hall

in Yuen Long) and on restoring heritage buildings (e.g. Ching Shu Hin in Ping Shan, Kun Lung Wai in Fanling and Yi Tai Shu Yuen in Kam Tin). Archaeological activities have, with the support of the Royal Hong Kong Jockey Club, continued at several sites of particular interest and these activities included a major rescue excavation at Yung Lung in Tuen Mun prior to the construction of a power station on the site. The Lord Wilson Heritage Trust has been established to encourage the preservation and conservation of Hong Kong's heritage.

Environmental Profile of Hong Kong

32 Hong Kong has a rich and diverse environment that merits our determination to protect and sustain it (Chapter 3). Although the measures described in this chapter have contributed to the preservation of our countryside and our antiquities and monuments, even more comprehensive measures will be necessary if Hong Kong is to develop a comprehensive conservation policy. Rapid development of our economic and physical infrastructure, coupled with substantial population growth, have been accompanied by a disregard for the effects of these developments on the environment. As Hong Kong is now embarked on even more substantial infrastructure development, and as we should take account of the principles of stewardship and of sustainable development, the adoption of a more holistic approach to the environment is desirable.

33 As a first step, later this year the Planning Department will publish a report on the Environmental Baseline for the Territory as part of the Territorial Development Strategy Review. It is also proposed that a comprehensive environmental profile of the territory should be compiled to provide the basic information necessary to ensure that future development is sustainable in the long term. Such a profile will:

- provide a centralised database as a repository for existing information to facilitate decision making on matters which affect Hong Kong's natural environment,
- act as an environmental education resource for the community;
- heritage issues;
- provide a basis for developing a comprehensive conservation strategy; and
- contribute to the objectives of global sustainable development.

5.34 The government will therefore cooperate with the World Wide Fund for Nature (Hong Kong) on the compilation of a comprehensive environmental profile of the Territory. This profile, when completed, will provide a database of Hong Kong's flora and fauna and the basic information that is necessary if programmes and policies are to be formulated in such a way as to ensure that development is sustainable in the long term. The compilation of the environmental profile will also enable Hong Kong to fulfil an obligation under the Biodiversity Convention, signed at Rio de Janeiro in June 1992, to prepare an inventory of plants and other wildlife.

Conservation Institutions

5.35 It is clear from the measures discussed in this Chapter that the broad range of conservation activities being undertaken and the size and range of conservation programme areas are considerable. Apart from the Agriculture and Fisheries Department (the major executive arm for natural conservation) and the Environmental Protection Department (the major executive arm for pollution control) different organisations — other government departments, the Municipal Councils, the District Boards, the conservation groups, scientists and academics and various community organisations — are involved in conservation. While these measures have contributed much to conservation, the government feels that pursuit of

the sustainable development goal will require a more coordinated approach. The government will therefore examine how these many strands can be woven together. While the extent to which re-organisation might produce a better response to the complex web of inter-related environment and conservation issues should not be over stated, various options may be considered and these include:

(a) extending the powers and terms of reference of the Country Parks Board;

(b) extending the terms of reference of the Environmental Pollution Advisory Committee; and

(c) the possible need for a Conservation Authority.

5.36 The environment does, of course, consist of more than trees and flowers, of parks and buildings. Indeed, none of these resources would be sustainable to any degree unless proper measures are taken to protect the environment's other key ingredients, particularly the air we breathe and the water that surrounds us, and to mitigate in an environmentally acceptable but affordable way the impact we have, as a community, on the environment that must sustain us. Chapter 6 will therefore examine the measures in hand — and possible additional measures — to protect these critical features of our environment.

CHAPTER 6

POLLUTION AND ITS CONTROL

6.1 Chapter 3 illustrated that Hong Kong has a beautiful natural environmental that needs to be protected, and Chapter 5 examined existing measures for this protection and considered fresh proposals for conservation. But these measures are only one aspect of our environmental protection programme; many others are necessary if we are to have a healthy environment. It is these further measures which are frequently the focus of discussion because they have a more direct impact on the community — that is, they have a greater effect on our health, on our daily lives, and directly or indirectly on our pocket — and which are now examined.

Air

6.2 Chapter 3 (paragraph 3.19) emphasised how important clean air is to the environment. Air quality data indicates that while sulphur dioxide levels are generally acceptable throughout the Territory, particulates and nitrogen dioxide levels remain high in many districts.

Policy Objectives

6.3 The government's overall policy objective for air pollution is to achieve and maintain an acceptable level of air quality to safeguard the health and well-being of the community. The immediate target is to achieve compliance with a set of air quality objectives for seven main air pollutants (see Table 6.1). These air quality objectives have been established for the protection of health, and are in line with the standards adopted by other developed countries. There is a need to review regularly this set of air quality objectives, progressively to include a wider range of air pollutants and extend their application to protect other beneficial uses, such as amenities, property and vegetation.

Air Pollution Problems

6.4 The health of the community is adversely effected by unacceptable levels of particulates and nitrogen dioxide and in some cases sulphur dioxide. The main sources of these pollutants are:

(a) the 8,500 tonnes of sulphur dioxide, 43,200 tonnes of nitrogen oxides and 5,900 tonnes of particulates emitted annually from the fleet of 423,966 licensed vehicles annually;

Pollutant	Concentration in micrograms per cubic metre [i] Averaging Time					Health effects of pollutant at elevated ambient levels
	1 hr [ii]	8 hrs [ii]	24 hrs [iii]	3 mths [iv]	1 yr [iv]	
Sulphur Dioxide	800		350		80	Respiratory illness; reduced lung function; morbidity and mortality rates increase at higher levels.
Total Suspended Particulates			260		80	Respirable fraction has effects on health.
Respirable Suspended Particulates [v]			180		55	Respiratory illness; reduced lung function, cancer risk for certain particles; morbidity and mortality rates increase at higher levels.
Nitrogen Dioxide	300			150		80 Respiratory irritation; increased susceptibility to respiratory infection; lung development impairment.
Carbon Monoxide	30000		10000			Impairment of co-ordination; deleterious to pregnant women and those with heart and circulatory conditions.
Photochemical Oxidants (as ozone) [vi]	240					Eye irritation; cough; reduced athletic performance; possible chromosome damage.
Lead				1.5		Affects cell and body processes; likely neuro-psychological effects, particularly in children; likely effects on rates of incidence of heart attacks, strokes and hypertension.

(i) Measured at 298°K (25°C) and 101.325 kPa (one atmosphere).

(ii) Not to be exceeded more than three times per year.

(iii) Not to be exceeded more than once per year.

(iv) Arithmetic means.

(v) Respirable suspended particulates means suspended particles in air with a nominal aerodynamic diameter of 10 micrometres and smaller.

(vi) Photochemical oxidants are determined by measurement of ozone only.

6.1 Air quality objectives

(b) the 7,600 tonnes of sulphur dioxide, 4,000 tonnes of nitrogen oxides and 400 tonnes of particulates emitted from industry annually; and

(c) the approximately 30% of the measured dust level due to construction activities.

6.5 The factors contributing to this situation are:

(a) the small area of developable land in Hong Kong: this results in high development densities and concentrates sources of pollution;

(b) mixed developments: this creates many industrial/residential interfaces where multi-storey residential estates are located close to buildings containing industries;

(c) uncoordinated development or redevelopment: this creates problems when new tall residential buildings are built too close to existing short industrial chimneys;

(d) large traffic volumes within the urban area: this causes high levels of nitrogen oxides and particulates at street level where dispersion is poor;

(e) the high proportion of diesel vehicles in Hong Kong: this results in high levels of nitrogen dioxide and particulates at street level; and

(f) the rapid growth rate of the vehicle fleet: this will more than offset the reduction in pollution brought about by stringent vehicle emission controls.

Air Pollution Control Legislation

6.6 The principal legislation for the management of air quality is the Air Pollution Control Ordinance (APCO) (Cap. 311). Additional provisions for dealing with specific types of air pollution problems are included in the Road Traffic Ordinance, which contains regulations to control smoke levels for in-service vehicles, and the Building (Demolition Works) Regulations, which regulates dust nuisances during the demolition of buildings. In the past year, significant progress has been made in strengthening the control provisions in the APCO. The Air Pollution Control (Amendment) Ordinance 1993, enacted in February 1993, extended controls on emissions from stationary sources and introduced new provisions to control environmental asbestos.

Controlling Air Pollution

6.7 Given the state of air pollution throughout the Territory and the need to conserve physical atmospheric conditions for ourselves and for future generations, the government should identify, anticipate and seek to prevent air pollution problems. Air quality standards must therefore be fully considered when drawing up development, transportation and land use plans.

6.8 The government will also:

(a) review, develop and enforce legislation to achieve health protection standards;

(b) ameliorate the adverse effects caused by major air polluters and industrial/residential interfaces by the use of planning and market forces; and

(c) ensure the effective use of "Best Practicable Means" and associated technology to reduce air pollution to a practicable minimum.

Mobile Sources

6.9 Motor vehicle emissions account for the bulk of the nitrogen dioxide in the air we breathe and vehicles powered by diesel engines contribute most of the particulates to the air in localities where there is heavy traffic. High concentrations of nitrogen

dioxide and particulates are now a widespread problem in Hong Kong. In January 1992, the government brought into effect the most stringent emission standards currently in use in the USA and Japan for new petrol vehicles These standards are also similar to those which recently took effect in Europe All newly registered petrol vehicles must comply with these standards which will reduce pollutants from individual vehicle emissions by as much as 90%. However, the reduction in the emission of nitrogen oxides from diesel vehicles, which make up the bulk of the vehicle fleet, will not be as large as that for petrol vehicles because of the current limits of vehicular technology with regard to heavy goods vehicles.

6.10 A further problem lies in the rapid growth in the number of vehicles in Hong Kong, and in their use. This growth is expected to more than off-set the reduction of nitrogen oxides and particulates gained by the new vehicle emission standards. If it continues, the emission of vehicular nitrogen oxides will increase by an estimated 60% by 2001. There is therefore a need to consider more far-reaching measures and to take greater account of environmental considerations during transportation policy formulation and planning.

6.11 Air quality, land use and transportation planners are therefore working closely together to ensure land use planning and the related transport infrastructure have greater regard for air quality implications. The possibility of limiting the growth in vehicle kilometres travelled, of shifting from diesel to petrol engine vehicles, and of moving towards the greater use of electrified transport will also be examined. Clearly, these are substantial issues as the implementation of such changes would have a considerable effect on the existing arrangements for public transport in Hong Kong, on transport planning, and on the cost of public transport services. Nevertheless, they are areas which will be examined by the government.

*6.12 Given the serious state of air pollution in some areas — and the fact that any environmental benefit from the measures described above will take a considerable time to achieve — the government proposes several interim measures to mitigate some of the worst effects. These measures are.

(a) by 1995, more stringent emission standards for diesel vehicles larger than 2 5 tonnes;

(b) by 1995, a requirement to use higher quality automotive diesel to enable adoption of up to date vehicle emission standards;

(c) by 1995, the imposition of higher penalties for smoky vehicles; and

(d) by 1995, increased vehicle inspection and maintenance programmes for commercial vehicles.

Electric Vehicles

6.13 In view of the reputed environmental benefits of electric vehicles, and the accelerated development of electric vehicle technology elsewhere in the world, the feasibility of their wider application in Hong Kong has initially been looked into by an interdepartmental working party. While it is recognised that electric vehicles are environmental friendly and are especially suitable for use in Hong Kong — where most vehicular journeys are short range and air pollution from diesel/petrol engined vehicles is a genuine problem — the commercial availability and cost of these vehicles at present prevent their wider and popular use in the Territory. However, the government will continue to monitor the development of electric vehicle technology and the availability of electric vehicles so that when their viability has been established, changes needed to facilitate and encourage the use of electric vehicles can be examined quickly. As a first step, the

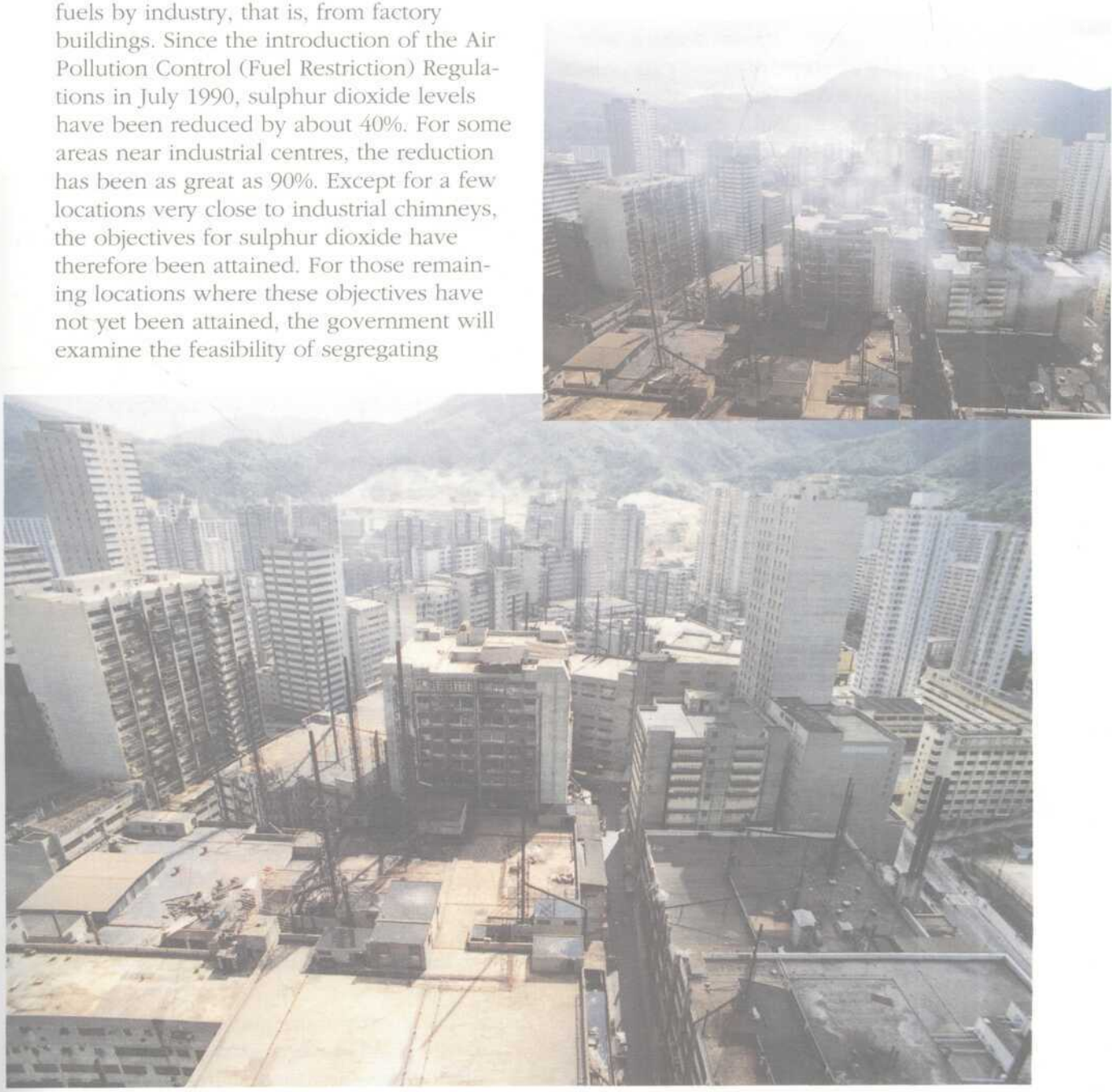
* For paragraph numbers marked with an asterisk, see paragraph 11.1

government will encourage the introduction of electric vehicles into Hong Kong by commissioning trials of electric vehicles among the government's fleet. Another proposal for consideration is the possibility of tax concessions.

Stationary Sources

6.14 The bulk of the sulphur dioxide in the air around us originates from the burning of fuels by industry, that is, from factory buildings. Since the introduction of the Air Pollution Control (Fuel Restriction) Regulations in July 1990, sulphur dioxide levels have been reduced by about 40%. For some areas near industrial centres, the reduction has been as great as 90%. Except for a few locations very close to industrial chimneys, the objectives for sulphur dioxide have therefore been attained. For those remaining locations where these objectives have not yet been attained, the government will examine the feasibility of segregating industrial and residential land uses.

*6.15 Construction activity and the open burning of refuse also contribute to air pollution from particulates. To tackle these problems the government proposes to introduce regulations to require the construction industry to implement appropriate dust control measures and to restrict the open burning of refuse and waste material within densely populated areas in 1994.



6.2 Air quality before and after introduction of controls

Power Stations

6.16 Power stations in Hong Kong are the largest emitters of sulphur dioxide and nitrogen dioxide. The power stations at Tap Shek Kok and Lamma Island now operate under a licence issued by the Director of Environmental Protection. These licences require the operators of the power stations to employ Best Practicable Means to control emissions to an acceptable level. Due to these requirements, and because of their well chosen locations and the installation of tall chimneys to disperse emissions away from sensitive receivers, these two power stations do not contribute significantly to the levels of air pollution in the urban areas.

6.17 The power station at Tsing Yi is currently exempted from licensing. This exemption will be removed under the Air Pollution Control (Amendment) Ordinance 1993.

6.18 The new power station at Black Point will be fuelled by natural gas. The anticipated benefits of this are that there will be almost zero sulphur dioxide emissions, a 50% reduction in nitrogen dioxide emissions, and the removal of most particulates and carbon dioxide.

6.19 Any proposals for new power stations in Hong Kong — as in the case of Black Point — will be subject to a comprehensive site search and an environmental impact assessment to ensure that air quality objectives are safeguarded and that, to control air pollution further, Best Practicable Means is applied to generating plant. Best Practicable Means ensures not only the provision and the efficient maintenance of appliances to control emissions of air pollutants, but also provides for the manner in which such appliances are used. Its formulation takes account of economic considerations, the availability of technology, the practice in other countries and any other factors be relevant to specific cases.

Incinerators

6.20 The incinerator at Lai Chi Kok was closed in 1989-90. The incinerator at Kennedy Town was closed in March 1993 after the commissioning of the Hong Kong Island East Transfer Station. The remaining municipal waste incinerator at Kwai Chung treats an average of 850 tonnes of refuse per day, or about 20 percent of the Territory's municipal waste. Although this incinerator is equipped with electrostatic precipitators for the removal of particulates and dust from the flue gases, other gaseous emissions still cause unacceptable air pollution. The Kwai Chung Incinerator will be closed in 1996, when the Kowloon West Transfer Station is commissioned.

Other Control Measures

6.21 The measures outlined above will, when fully implemented, contribute substantially to the achievement of Air Quality Objectives (AQOs). But given the importance to the health of the community of achieving AQOs, the government will apply the following additional air pollution control programmes:

(a) by 1997, all major air polluting industrial processes, such as power stations, steel works and cement plants will be licensed by the Director of Environmental Protection. The licences will, inter alia, specify the use of Best Practicable Means; and

(b) by 1997, the Director of Environmental Protection will, on the basis of a preliminary study started in mid 1993, develop a comprehensive control programme on toxic air pollutants not already controlled and which, at very low concentrations, can endanger human health.

Indoor Air Pollution

6.22 Like many communities, Hong Kong has allocated resources to deal with the more obvious environmental problems and to provide the physical infrastructure neces-

sary to protect the environment. However, it is now becoming clear that the general health of a community is affected by matters that go beyond environmental problems in the outdoor environment. For example:

(a) **Radon**: This is a chemically inert but radioactive gas which may emanate from certain granitic and other rocks used as aggregates in construction. When either the radon gas or its decayed products are inhaled, they will continue to disintegrate and emit alpha particles and gamma rays. The decay products are solid and, as very fine particles, they may get trapped in the lungs where they continue to emit radiation. An abnormally high exposure rate may cause tissue damage in the lung and increase the chance of development of lung cancer. However, radon can be reduced significantly by adequate ventilation of the living and working environment.

(b) **Sick Building Syndrome** (SBS): This syndrome was first recognised in the late 1970s. The World Health Organisation defines the term as complaints covering a syndrome of non-specific feelings of malaise, the onset of which is associated with the occupancy of certain modern buildings. Symptoms include irritation of the eyes, nose and throat, erythema and headaches, and mental fatigue, nausea and dizziness. These tend to disappear once the sufferer leaves the building.

(c) **Legionnaires Disease**: This is a specific identifiable illness. Measures have been put in hand to advise the public of practical ways of eliminating the possibility of this disease, by way of appropriate design for new installations, and thorough maintenance of existing air conditioning systems. Since July 1993, a publicity leaflet giving this advice has been sent to private building owners with their annual lift certificate renewals. Relevant professional bodies were also issued with the leaflets.

(d) **Enclosed areas with public access**: There is concern over the dangers to health of polluted air in confined areas such as underground car parks, road tunnels and transport interchanges, about which little is known.

(e) **Smoking**: The government is also concerned about the effects of smoking on the health of people in the indoor environment. Government's policy in this area is pragmatic and progressive. It has evolved over the years, taking into account changing community attitudes and trends overseas. Additional control measures were introduced in January 1992. A consultation exercise was also carried out in late 1992 to seek the public's views on further anti-smoking proposals. At present, the Smoking (Public Health) Ordinance prohibits smoking in certain public enclosed places, namely all forms of public transport, public lifts, amusement game centres and in the seating accommodation of .cinemas, theatres, concert halls and places of public entertainment. Smoking is also prohibited administratively in schools, hospitals and public parts of government offices (including leased premises).

6.23 To address these issues, the government will undertake several additional and wide-ranging measures:

(a) **Radon**: assess the level of hazard associated with radon by determining the potential release of radon from natural rock in Hong Kong and complete a survey of radon exposure in buildings. If a problem is found to exist, a programme of management and mitigating measures will be developed;

(b) **Sick Building Syndrome**: consider possible additional control requirements to those provided for under the Buildings Amendment Bill on Ventilation Systems, and, by 1995, define

what other mitigating measures may be needed.

(c) **Enclosed areas with public access**: by 1994, specify satisfactory states of air quality in semi-enclosed locations such as tunnels, car parks and transport interchanges, and, by 1996, complete guidelines and practice notes to ensure good design of ventilation systems and their proper operation; and

(d) **Smoking**: the public's views, together with the findings in the recent United States Environmental Protection Agency report on environmental tobacco smoke, will be taken into account in considering whether additional measures should be introduced. Such measures may include control over smoking in the workplace and in public enclosed places where it is not already prohibited.

Water

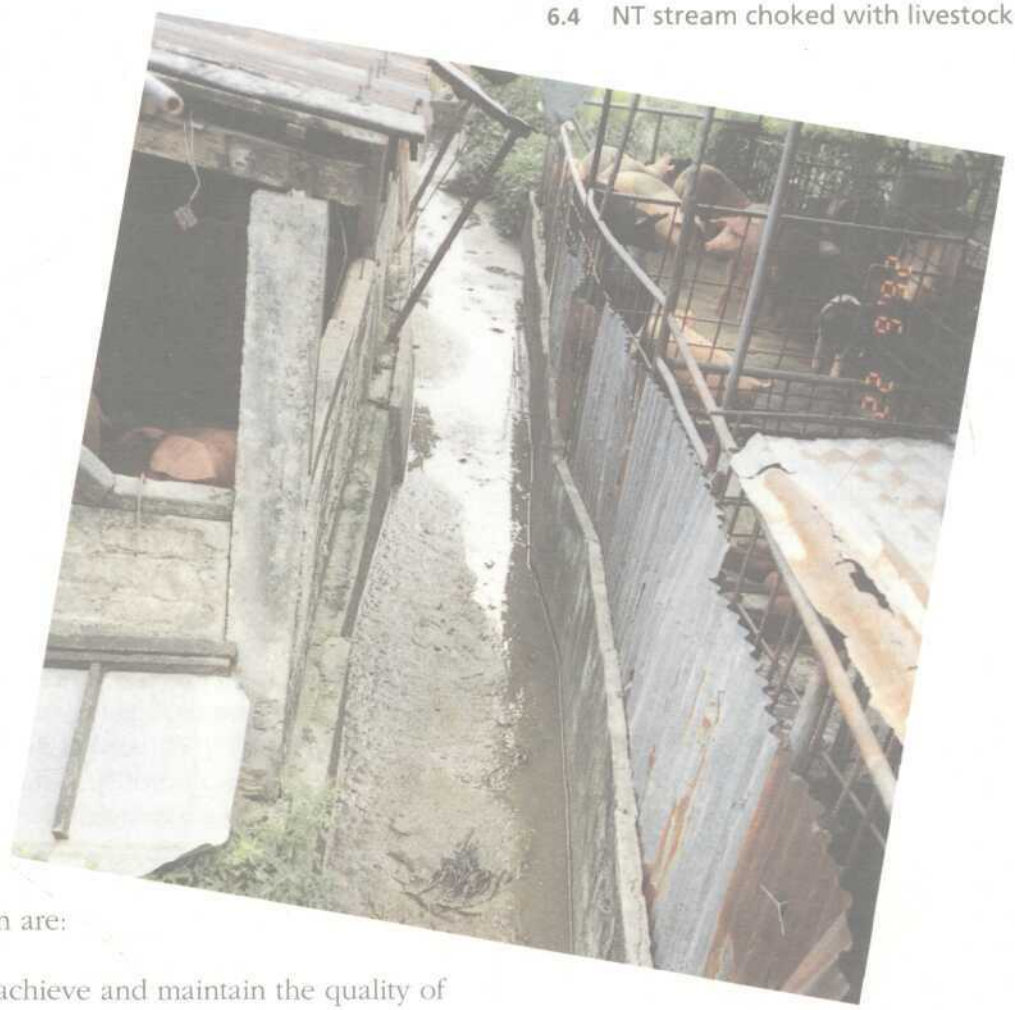
6.24 Water is a finite resource essential to human life. It is used at home, in industry and in agriculture; it is used for transport, fishing and recreation. Hong Kong is largely surrounded by water, and the central harbour is the focal point of the Territory. There are also six hundred rivers and streams in the New Territories, the water from which is used for domestic purposes, for irrigation, and for recreation. Hong Kong's waters support billions of freshwater and marine organisms.

Policy Objectives

6.25 Chapter 3 (paragraph 3.20) described how vital the sea is to the life of Hong Kong. Measures are therefore necessary to protect this important part of our environment. As stated in the 1989 White Paper, the government's overall policy objectives for water

6.3 Victoria harbour

6.4 NT stream choked with livestock waste



pollution are:

(a) to achieve and maintain the quality of inshore waters so that they can be used for their legitimate purposes;

(b) to provide public sewerage of adequate size to accept all existing and prospective waste water discharges;

(c) to provide waste water treatment and disposal for all waste waters collected in the public sewerage system at standards which will ensure that water quality objectives are achieved and maintained; and

(d) to put in place and enforce legislation aimed at safeguarding the health and welfare of the community from the adverse environmental effects associated with the discharge of toxic chemicals and bacteria.

Meeting these objectives is one of our most challenging environmental tasks.

Water Pollution Problems

6.26 Hong Kong's piecemeal but at times rapid growth has left the Territory with an overloaded and inadequate sewerage system so that about half the sewage and industrial effluent reaches the sea via the storm drainage system with no treatment. Apart from domestic sewage, there is also substantial water pollution arising from Hong Kong's manufacturing industries — the main industrial sources of water pollution being textile bleaching, dyeing, printing and finishing, electroplating and printed circuit board manufacture. Other serious water pollution sources include food and beverage manufacturers, restaurants and cooked food suppliers in the densely populated urban areas, and the livestock keeping industry in the New Territories. Restaurants are a major cause of drainage problems due to uncontrolled disposal of

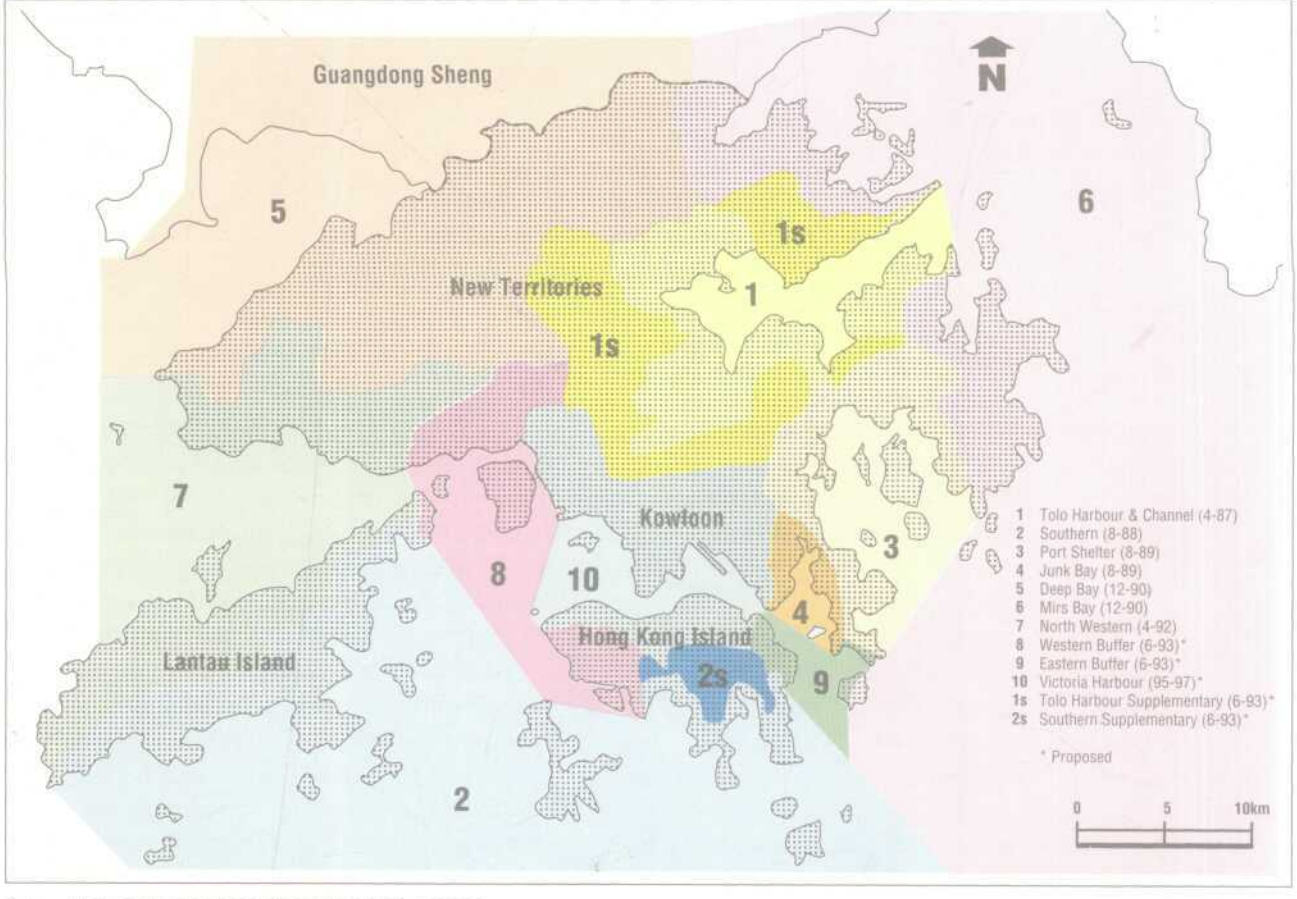
oil and grease. The indiscriminate disposal of livestock waste has severely polluted many watercourses. However, within Victoria Harbour, over half of the pollution is from domestic sewage.

6.27 The following sections set out the various measures that are being deployed to abate this serious pollution so as to achieve and to maintain a satisfactory level of water quality for the whole of Hong Kong's aquatic environment. These measures are: legislative controls; the construction of new sewerage; the financing of sewerage programmes; and sewerage planning and maintenance programmes. (Measures for dealing with livestock waste are set out in the section dealing with Waste Disposal (paragraph 6.97)).

Water Pollution Control Legislation

6.28 Hong Kong's main water management law is the Water Pollution Control Ordinance (WPCO) (Cap. 358). Enacted in 1980, it allows the government to set up Water Control Zones (WCZs) in which regulations to control effluent discharges are applied. Each zone has water quality objectives (WQOs), and the Director of Environmental Protection has a statutory duty to see that they are achieved and maintained. The object of the WPCO is to protect the aquatic environment from abuse, to protect expensive sewerage, and to protect the health and safety of sewerage workers.

6.29 To enable control measures to be implemented over a reasonable time scale, two action dates are appointed for each WCZ under the WPCO. These action dates are the First Appointed Day (FAD) and the Second Appointed Day (SAD). Normally some six months lapse between the two dates to enable effluent dischargers in the WCZ, and the authority, sufficient time to complete the licensing requirements. A



6.5 Hong Kong's water control zones

licence should be obtained before a new discharge commences. For discharges in existence before the FAD, an application for a licence should be made before the SAD. To assist licensees to understand their obligations under the WPCO a simple guide is published by the Environmental Protection Department and widely distributed via the Department's Local Control Office and District Offices.

Water Control Zones

*6.30 The WPCO is now in force in nine out of the ten WCZs namely, Tolo (declared in 1987), Southern (1988), Port Shelter and Junk Bay (1989), Deep Bay and Mirs Bay (1990), North Western (1992) and Eastern & Western Buffers (1993). The remaining zone in Victoria Harbour will be declared in phases, from 1994 to 1997, by which time all of Hong Kong's waters will be within the jurisdiction of the WPCO.

Effluent Standards

6.31 Clear standards have now been established for effluents discharged to sewers and to the environment. To ensure that due account is given to the possibility of the synergistic effects (that is the total interrelated effects) of the many individual components in effluents, the government is considering incorporating relative toxicity as a standard for effluents and may establish mechanisms for screening effluents for toxicity.

Non-point Source Pollution

6.32 The WPCO is aimed at controlling discharges at source (in factories, restaurants and homes etc.). The government also intends to move to control non-point source discharges, and toxic substances generally. Programmes will be developed to allow controls to be placed on the use of pesticides, herbicides and other toxic substances. The occurrence and fate of these substances in the local environment will be investigated

Water Quality Objectives

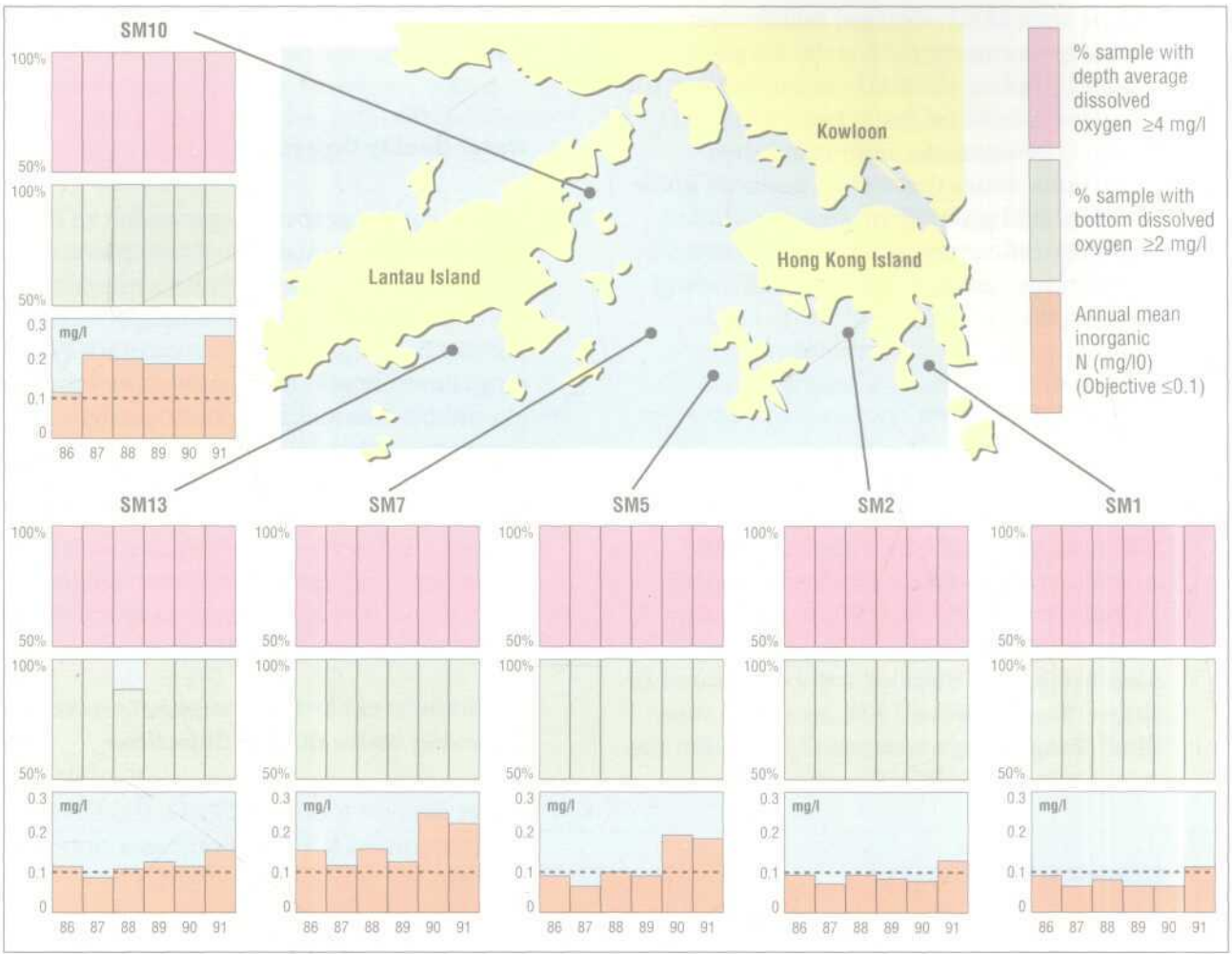
6.33 WQOs are the scientific expression of the minimum water quality that will protect the conservation goals and, as far as possible, are expressed in precise numerical terms. The WPCO requires the Secretary for Planning, Environment and Lands, after consulting the Environmental Pollution Advisory Committee, to publish WQOs. WQOs have been published for all the WCZs declared so far and a statement of each established objective is kept with the register of WQOs in the Environmental Protection Department; these may be referred to by interested parties and members of the public.

Achieving Water Quality Objectives

6.34 Under Section 6 of the WPCO, the Director of Environmental Protection has a duty to achieve and maintain the WQOs established for the WCZs declared under the Ordinance. The Environmental Protection Department therefore conducts an extensive programme of water monitoring that covers our marine waters, typhoon shelters, bathing beaches and selected rivers and streams. The results of this monitoring are published in annual reports on marine and river water quality, and on the bacteriological water quality of bathing beaches in Hong Kong. These reports confirm the seriousness of water pollution in Hong Kong. Monitoring also serves to provide the Environmental Protection Department with the information needed to elucidate the link between polluting loads and environmental degradation, and by doing so to target pollution control measures in the most cost-effective manner.

Marine Waters

6.35 Although Tolo Harbour does not meet all its WQOs, deterioration in water quality



6.6 Water quality objectives in southern waters

appears to have been halted. There is now a broad programme of control activities — the Tolo Harbour Action Plan — aimed at protecting the sensitive waters of Tolo Harbour. The principal measures in this programme are -

(a) as an interim measure, the upgrading of the Sha Tin and Tai Po sewage treatment works to remove nutrients;

(b) as a longer term solution, a scheme to transfer treated effluent from the Sha Tin and Tai Po works out of the catchment completely;

(c) the provision of sewerage in unsewered areas to collect polluting domestic flows;

(d) the banning of livestock keeping in urban areas;

6.7 Tolo Harbour

(e) the rigorous control of livestock waste disposal in rural parts of the catchment; and

6.8 Deep Bay

(f) the rigorous control of the disposal of commercial and industrial effluents.

6.36 Deep Bay is one of the more polluted parts of Hong Kong's waters. Due to the influence of polluted flows from the Pearl, Shenzhen and Yuen Long rivers, bacteria and nutrient loads are high. Various measures have been, or will be applied, to abate this pollution and principal amongst them are -

(a) the gradual implementation of the Livestock Waste Control Scheme;

(b) the completion of environmental protection strategies agreed by the Joint Hong Kong — Guangdong Environmental Protection Liaison Group; and

(c) continued enforcement under the WPCO.

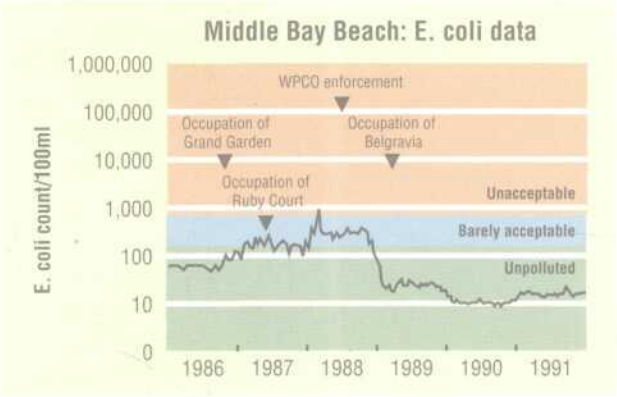
6.37 Deep Bay is the site of the important Mai Po Marshes and of extensive oyster fisheries. Work will continue to identify the WQOs needed to protect both the fisheries and the local habitats.

6.38 Hong Kong's southern and eastern waters meet their WQOs for the most part. Only the western part of the Southern WCZ has excessive nitrogen levels, mainly from the Pearl River.

Victoria Harbour

*6.39 The size of the population and the level of industrial activity around Victoria Harbour have caused a steady decline in its water quality. However, in the more open and better flushed areas of the harbour, the declining trend has levelled off although sediment contamination in the harbour remains high. In some areas of the inner harbour, particularly in the vicinity of Rambler Channel, the level of contamination of marine muds by heavy metals is very

high. These problems will be brought under control by the implementation of the Waste Disposal (Chemical Waste) (General) Regulation and by the declaration of the remaining Victoria Harbour WCZ. To minimise the risk to the environment, existing contaminated sediments will, as far as possible, be left where they are with new land being formed above them where reclamation is necessary. Where dredging is unavoidable the government will enforce a tightly controlled disposal programme.



6.9 Water quality at a Hong Kong beach

Bathing Beaches

6.40 There has been some success in reducing bathing beach pollution although substantial further improvements to beach water quality generally cannot be expected until both the Water Pollution Control Ordinance and the Livestock Waste Control Scheme have been fully implemented and the engineering projects of the sewage strategy have been commissioned. However, the popular bathing beaches in the Southern district have been protected via a combination of "first aid" measures and advanced engineering works, mainly to intercept and divert polluted dry weather flows in storm drains, and the implementation of the WPCO in the area.

6.41 Although major improvements have been brought about, investigations of the link between pollution and human health at bathing beaches will continue in order to prevent and monitor pollution more cost-effectively. Work will also continue on the causes of red tides and the measures most likely to reduce their incidence. Having made considerable progress in improving water quality at many beaches by tackling land-based sources of pollution, the government will now look more closely at floating sources of pollution. Legislation will be developed to require all vessels above a certain minimum size to carry on-board sewage reception facilities.

Rivers and Streams

6.42 There has been a modest but steady improvement in river and stream water quality since 1989 due to the more effective controls over effluent discharges under both the WPCO and the Livestock Waste Control Scheme, and because of the provision of new sewerage in the New Towns. In general, the water quality in streams in the eastern part of the Territory is improving although the rivers Indus and Beas and the Yuen Long Creek and Kam Tin River in the north remain heavily polluted with livestock waste. Improvements to these rivers will be achieved when the Livestock Waste Control Scheme has been fully implemented, localised sewerage master plans have been completed, and various river management schemes have been implemented.

6.43 Although clear objectives for achieving a satisfactory state of cleanliness for the Territory's water-body have been set down under the WPCO, we will not be able to

6.11 Drainage works in Southern district

6.10 Shing Mun River

achieve these objectives, particularly in Victoria Harbour, until we have sufficient sewerage facilities for the proper collection, treatment and disposal of sewage. These facilities will be provided under the 1989 Sewage Strategy.

Sewage Strategy

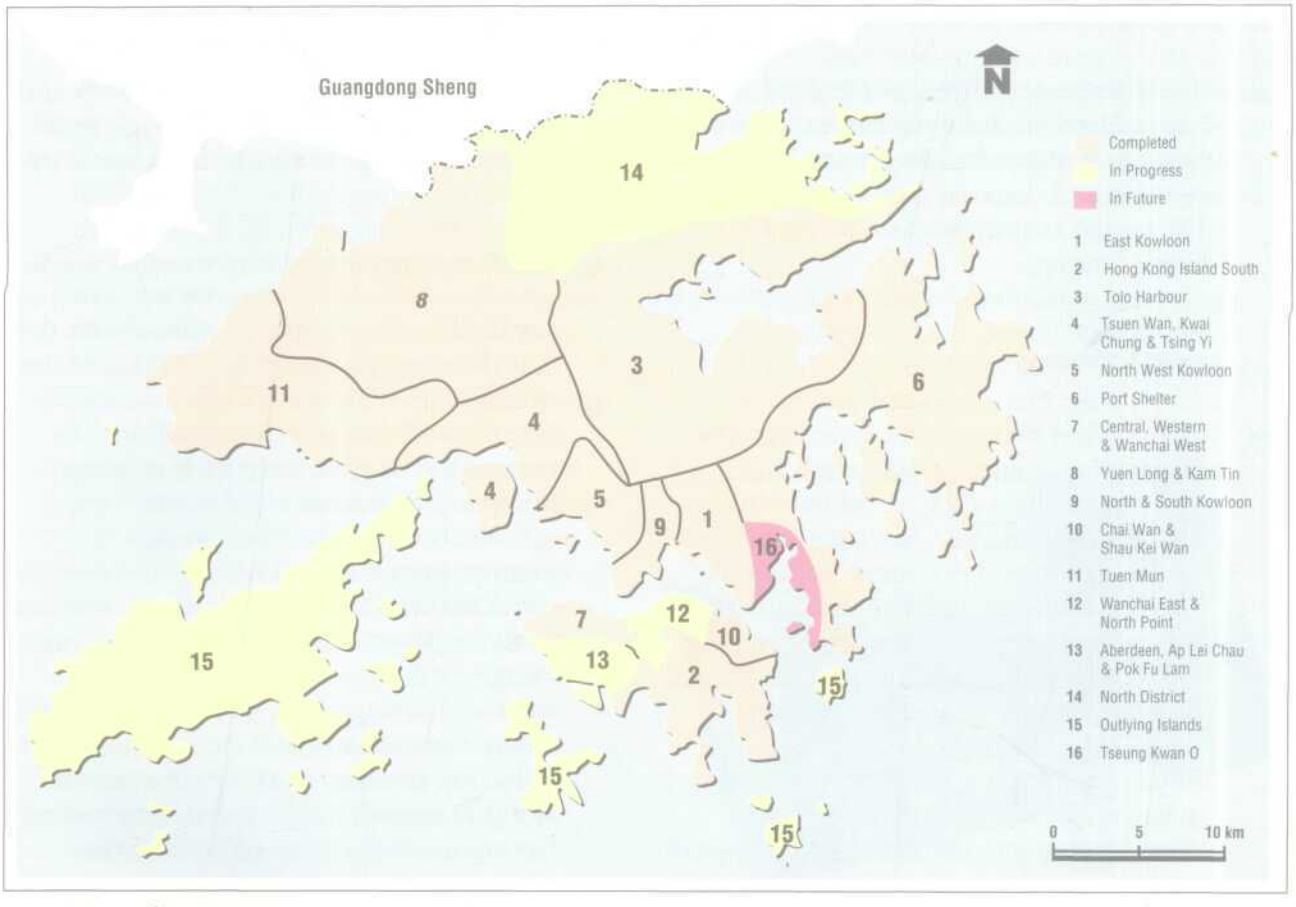
6.44 While the last two decades have seen the construction of many modern sewage treatment facilities, total investment in sewerage infrastructure has lagged behind our population and economic growth. In the urban areas around Victoria Harbour, over fifty percent of the sewage, including most of the industrial effluent, is discharged into stormwater drains leading directly to the sea. Where sewage is discharged correctly to foul sewers, it receives only minimal treatment in the form of screening before flowing into the harbour. The newly constructed and proposed reclamations in Victoria Harbour will continue to diminish the natural ability of the sea to absorb and purify sewage. Without the Sewage Strategy, we will not be able to meet statutory WQOs.

6.45 The Sewage Strategy proposes that a safe environment is best achieved by combining land-based sewage treatment with the natural self-purification capabilities of the ocean. This is an energy efficient, highly reliable and cost effective solution. The core of the sewage strategy is a comprehensive programme of new sewerage infrastructure. Under the strategy, the metropolitan area will for the first time be provided with up-to-date sewage treatment facilities. Elsewhere, new towns and major villages will be served by sewerage systems and sewage treatment facilities which, where appropriate, will include nutrient reduction processes. All urban areas of Hong Kong will be provided with sewers having the capacity to receive all the sewage and industrial effluents produced within their catchment area.

6.46 Even so, the new sewerage infrastructure will not provide the necessary improvements to water quality unless the many polluting and toxic discharges are brought under control, and effluents presently flowing into storm drains are redirected into the foul sewers. These activities make up the remainder of the Sewage Strategy which requires new legislation, higher levels of enforcement, increased public awareness, more trained sanitation personnel, and better planning of future developments and environmental infrastructure.

6.47 The Sewage Strategy is therefore a key element in the government's overall anti-pollution strategy. Without it, the present practice of discharging inadequately treated sewage into the waters around Hong Kong will lead to a threat to public health and cause further damage to the environment. The longer this damage continues unabated, the greater will be the eventual cost of dealing with it and the health risks associated with inadequate sewage services. The effects on public health range from the transmission of water borne diseases such as typhoid and hepatitis A, to the contamination of seafood with heavy metals and toxic organic pollutants. These consequences emphasise the need to maintain the momentum of the Sewage Strategy.

6.48 In summary, under the Sewage Strategy, the capital programme requires that all our sewage and waste waters be diverted into foul sewers rather than stormwater drains and therefore properly collected. This requirement will be met by the implementation of Territory-wide sewerage masterplans (SMPs). The purposes of the SMPs are to enhance the effectiveness of existing sewerage facilities in particular regions and to ensure the provision of a proper and adequate sewerage network to collect all sewage arising in the area covered by the plan.



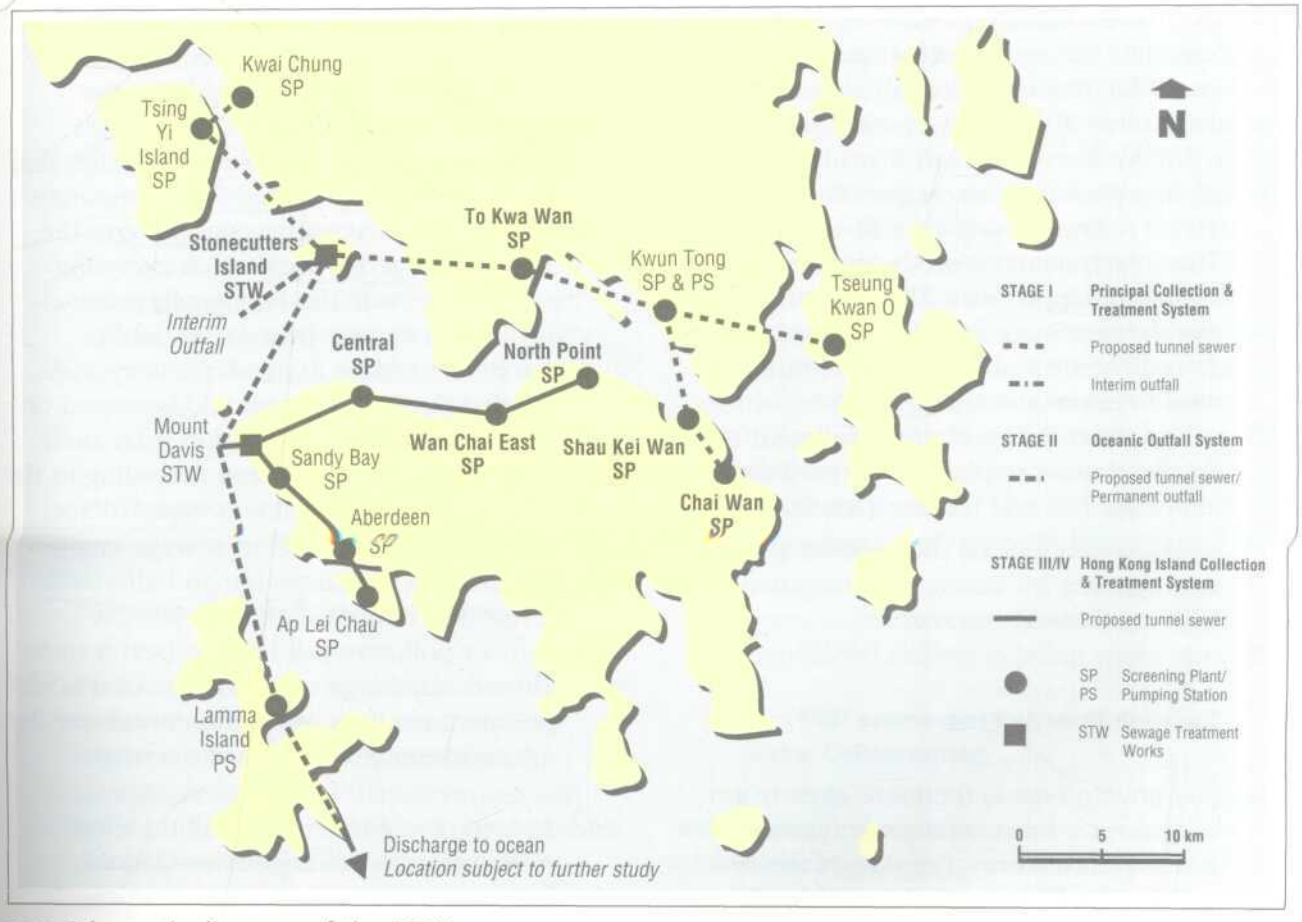
6.12 Map of SMP areas

Sewerage Master Plans

6.49 Without adequate sewers to collect sewage and industrial effluents, sewage treatment works would be only partially effective in controlling water pollution, and far from cost effective. In order to assess the need for new or enlarged sewers, detailed investigations are being carried out into the size and condition of the sewerage infrastructure in each of the sixteen main sewerage catchment areas. Using the results of these investigations, SMPs are prepared, setting out plans and programmes for the construction of the necessary sewers and other sewerage facilities. Planning has been completed or is in progress for fifteen of the sewerage catchment areas. Sewerage improvement has started in southern Hong Kong, east Kowloon, north west Kowloon and Tolo Harbour, and schemes in many other areas are in the planning and design stages. The anticipated commissioning dates and estimated costs for all the major sewerage improvement projects are shown in Annex D.

Strategic Sewage Disposal Scheme (SSDS)

6.50 The SMPs for the sewerage catchments round the central harbour envisage the proper collection of sewage and industrial effluents. Once collected, these waste waters must be properly treated and disposed of. The SSDS will provide a further tier of sewerage in the form of large tunnels one hundred and fifty metres underground, to enable wastewaters to be delivered to two treatment plants, one on Stonecutters Island and the other under Mount Davis. Upon full completion, a combination of physical and chemical treatment will be provided before discharge to the South China Sea via a system of submarine diffusers constructed in deep water south of Lamma Island.



6.13 Schematic diagram of the SSDS

6.51 The SSDS will be constructed in four stages:

(a) Stage I Principal Collection and Treatment System (1997)[1]
(b) Stage II Oceanic Outfall (2003)[1]
(c) Stage III & IV Hong Kong Island Collection and Treatment System (2003)[1]

[1] planned date of commissioning

6.52 The preliminary design and site investigation for the whole scheme has been completed, and the detailed design of Stage I (the deep tunnel extending from Tseung Kwan O, via Shau Kei Wan, Chai Wan, Kowloon, Tsuen Wan/Tsing Yi to the Stonecutters Island sewage treatment works) began in August 1993.

6.53 The submarine oceanic outfall, Stage II of the SSDS, is planned to discharge treated effluent into deep water beyond the limit of Hong Kong waters. A mathematical computer model is being developed to predict the effect of the outfall on water quality and to determine the optimum location. Calibration of the model has required extensive monitoring of the water quality and currents in the whole of the Pearl River Delta, which has been achieved in cooperation with several organisations and authorities in China. Arrangements are being made to consult the appropriate Chinese authorities over the necessary approvals. Preparations are now being made for an Environmental Impact Assessment (EIA), much of which will be concerned with the effect of the outfall on water quality. After the completion of the EIA and the acceptance of its recommendations by the Chinese authorities, the detailed design and construction of the outfall could commence.

The High Priority Programme (HPP)

6.54 The government is therefore already embarked on a substantial programme of new sewerage. However, because of the serious pollution in Victoria Harbour, there is an urgent need to construct and commission the first stage of the SSDS (the Principal Collection and Treatment System) as soon as possible. The government has therefore devised a High Priority Programme which comprises Stage I of the SSDS and the SMPs that will connect to the treatment system. This HPP will provide for the proper collection, treatment and interim disposal for some 70% of the sewage that is being discharged into the Victoria Harbour each day.

The Polluter Pays Principle — Charges for Sewage Services

6.55 These essential and urgently needed sewage programmes are of course expensive. The entire capital programme of the Sewage Strategy will require some $20 billion over the next 10 years. Of this, $8.1 billion is required for the HPP. It will not be possible to fund this from the Capital Works Reserve Fund in the normal way.

6.56 As we all contribute in one way or another to water pollution, it is reasonable that we should all contribute to help solve the problem. Overall, the government will make $8.1 billion available for the HPP that will be complete in 1997. The community has also been invited to contribute to the cost of sewage services which everyone uses. In line with the Polluter Pays Principle, it has been proposed that public charges should be applied Territory-wide, and that these charges should be based on the volume of sewage produced by each water consumer, calculated according to the reading of each consumer's water meter. For the residential sector, sewage charges will be kept at reasonable and affordable levels. For industrial and commercial users, heavier polluters will have to bear a trade effluent surcharge based on the excess of pollutant loads in these effluents above the average strength of domestic sewage.

6.57 In 1994, the government will therefore introduce into the Legislative Council legislation to enable the introduction of charges for sewage services. It is intended

that charges will begin in the 1994 financial year.

Legislative Amendments

6.58 It is important to ensure that the expensive sewage facilities to be provided are properly maintained and protected. The principal legislative mechanism is the WPCO. However, since it was first introduced in 1980, it has become clear that the Ordinance needs substantial revision and updating if its provisions are to enable Hong Kong to meet its environmental objectives. Consequently, a programme of amendments has been devised to improve the Ordinance. The first substantial amendments were approved by the Legislative Council in July 1990 and took effect in December 1990. The effect of these amendments was to replace all exemptions for discharges by a right to a licence with specified conditions for compliance. A further comprehensive amendment to the Ordinance was introduced into the Legislative Council in December 1992. These later amendments will enable regulations to be made to allow the government to require property owners to re-arrange drainage of their properties to facilitate connections to new sewerage. This is to ensure investment in expensive sewerage is not wasted. The amendments also provide a framework to ensure the proper operation and maintenance of private treatment facilities, and to increase substantially the maximum penalties for discharges of toxic and hazardous waste into communal sewers or any waters of Hong Kong.

Planning Against Water Pollution

6.59 Positive planning is essential to ensure that, in future, industries and other developments are located in environmentally acceptable areas and that sewerage and sewage treatment facilities are provided in parallel with such developments. The environmental impact of these new developments — such as strategic reclamations, typhoon shelters or port facilities — are tested using the Water Quality and Hydraulic Model (WAHMO). WAHMO helps assess the impacts on water quality of major engineering works and the seasonal circulation of waters in Hong Kong. Its has already helped assess the environmental implications on water quality of major developments and determine the feasibility, the cost and the timescale necessary to upgrade sewerage facilities to safeguard WQOs.

6.60 The current Territorial Development Strategy Review addresses, among other environmental issues, the need to achieve WQOs in specific water bodies by considering the capacity of the existing and planned sewerage systems in the formation of the broad land use pattern for the Territory.

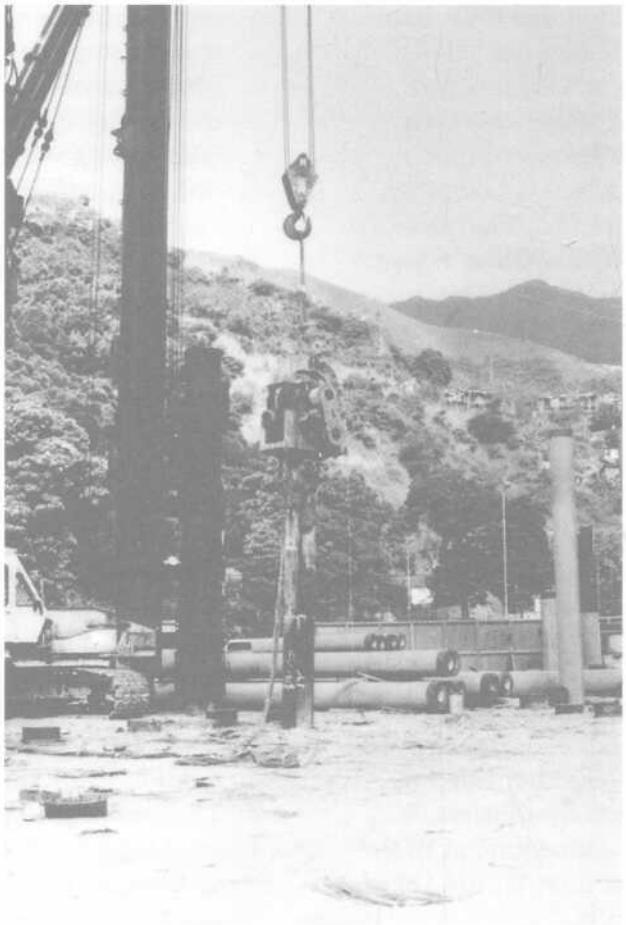
Maintenance

6.61 The Drainage Services Department was established in 1989. Its primary function is to design, construct and operate the sewerage programmes under the 1989 Sewage Strategy. The Department is also responsible for the regular maintenance and repair of some 1,100 kilometres of public sewers in the Territory and 110 sewage treatment and ancillary facilities which treat the collected sewage prior to disposal. Every year, about 18 kilometres of new sewers are added to the network. Over the next five years, when Stage I of the SSDS and other sewerage programmes have been completed, there will be 1,210 kilometres of sewers and 175 sewage treatment and ancillary facilities. The Drainage Services Department will seek to increase and upgrade its services for the maintenance of sewers and treatment works, on which some $360 million is being spent annually.

Water Conservation

6.62 Water is a precious natural resource and conservation in its use by all concerned should be encouraged. The Water Supplies Department issues free leaflets, posters and

labels on water conservation to the general public and to other major consumers. The existing tiered pricing structure in charging for domestic consumption also has the built-in element of discouraging lavish consumption. In addition, 65% of the territory's population use salt water for flushing purposes — it is planned to increase this figure to 90% during the next few years.



6.14 Percussive piling machine

Noise

Policy Objectives

6.63 The policy objective for controlling noise pollution is to ensure that a satisfactory noise environment is attained and maintained in order to safeguard the quality of life for the populace. In a dynamic, crowded metropolis such as Hong Kong, this is a difficult task.

6.64 Hong Kong is perhaps one of the noisiest cities in the world. An estimated 350,000 people are exposed to severe aircraft noise and close to a million people are exposed to high levels of road traffic noise. Various other activities such as construction, cargo-handling, industrial and commercial facilities all generate noise that results in speech interference for classrooms during daytime and sleep disturbance for the general population at night.

6.65 Government responds to these problems in three ways: controlling noisy activities and products through the enforcement of noise control legislation; incorporating noise mitigation measures in new projects by providing advice at the planning stage; and providing control measure to abate existing noise problems.

Noise Control Legislation

6.66 Legislation is already in place to provide some relief to the 350,000 residents living under the flight paths of Kai Tak. The Civil Aviation (Aircraft Noise) Ordinance (Cap. 312) (CA(AN)O) and its subsidiary legislation, enforced by the Director of Civil Aviation, prohibit aircraft take-off and landings between 12 midnight and 6.30 a.m., except in unforeseen and emergency situations. Restrictions also apply to flights over north Kowloon between 9 p.m. to 12 midnight. Amendments to the CA(AN)O are being drafted to ban the operation of "Chapter 2 aircraft" in Hong Kong (a classification of noisier aircraft by the International Civil Aviation Organization), in line with international practice.

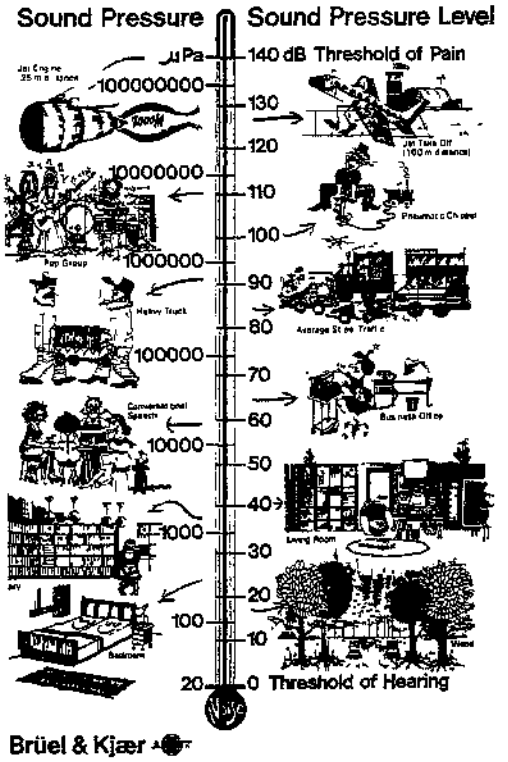
6.67 The key legislative instruments for controlling noise, other than those from aircraft and road traffic, are the Noise Control Ordinance (Cap. 400) (NCO), and the regulations and three technical memoranda provided for under that Ordinance. Percussive piling is banned during restricted hours (7 p.m. to 7 a.m. and on general holidays). During weekdays, where there were previously no controls between the hours of 7 a.m. and 7 p.m., now the Ordinance may restrict percussive piling operations to

either five or three hours. The use of powered mechanical equipment for construction between 7 p.m. and 7 a.m., and on holidays, is strictly controlled via a Construction Noise Permit system. The introduction of two sets of regulations in 1992, which require that hand held percussive breakers and air compressors comply with the latest European Community noise emission standards, has brought about the replacement of old and noisier models.

58 Regulations to control noise from motor vehicles will also be proposed in 1994. The regulations will require most categories of new vehicles to meet standards comparable to the relevant European and Japanese standards before they are permitted to be registered in Hong Kong.

69 However, despite these measures, community demands for a quieter environment have grown since 1989, when the NCO was enacted. Quieter technology is also more readily available. Government recognizes that current controls do not go far enough and various measures are therefore being examined or put into place to further abate noise from construction activities. These measures are:

(a) Improved controls on activities involving powered mechanical equipment and non-powered mechanical equipment work in built-up areas were drafted in the Noise Control (Amendment) Bill and introduced to the Legislative Council in May 1993.



6.15 Noise levels and causes

(b) The use of noisy (and air polluting) diesel hammers in piling will be prohibited in built-up areas. Quieter hydraulic hammers are being considered as a replacement

(c) Regulations requiring the use of quieter hydraulic concrete crushers in place of very noisy excavator-mounte percussive pneumatic breakers (commonly known as jack-hammers) used in demolition and road openings will be drafted.

(d) A review of the general daytime construction noise impact will be carried out to determine if further measures such as the use of acoustic hoardings and enclosures should be required in particular situations.

Noise Complaints

6.70 Enforcement of the Noise Control Ordinance is mainly through response to complaints. The Police provide an immediate response to complaints about noise from construction activities governed by construction noise permits and noise labels, as well as noise from domestic premises and public places. Most of these problems are resolved through warnings and advice and by prosecution if necessary. The Environmental Protection Department also carries out special surveillance checks on construction activities, mainly in response to complaints, and prosecutes offenders. Noise from industrial and commercial premises is investigated by the Environmental Protection

Department in response to complaints and dealt with by advice, warning and the issue of noise abatement notices as necessary. Offenders are prosecuted if the requirements of the notices are not complied with.

6.71 With more people living close to the railway lines and the tightening of the noise control legislation, noise from the operation of railways has become a cause of concern. Both the KCRC and MTRC were advised by the Environmental Protection Department to carry out comprehensive studies and measures to abate such noise. In April 1993, the KCRC announced a 10 year noise abatement programme costing $620 million (at 1992 prices) to reduce their train noise. It is expected that the programme will benefit a total of about 46,000 people living along the railway line. The MTRC also began a noise abatement programme in March 1993 to reduce the noise from their system.

Prevention by Planning

6.72 Some of today's noise problems arise from a lack of professional input on noise aspects in the planning stage. In an effort to ensure that new noise sensitive developments will not be exposed to excessive noise, the Environmental Protection Department will continue to devote resources to planning against noise. Environmental considerations are now recognised aspects to be considered in land use planning and will be examined further in the Town Planning Ordinance review. EIA for all major public and private development projects is also an established practice whereby, among other environmental issues, the noise impact arising from the construction and operation of such projects are examined at the planning stage. Mitigating measures are then identified and implemented whenever practicable. The Tate's Cairn Tunnel approach roads near Choi Hung Estate and Richland Gardens in Kowloon are good examples of mitigation measures — quiet road surface, barriers and covers — to reduce the noise impact brought about by a new road scheme to existing premises incorporated as a result of noise assessments.

6.73 Preventative planning has done much to protect new noise sensitive developments, such as homes, schools and hospitals, from excessive levels of noise and to prevent existing noise sensitive developments from being exposed to increased noise from new highways. For example, before planning against noise became a routine part of the development process, some 21% of the flats in a new development would have been exposed to noise levels above those prescribed in the Hong Kong Planning Standards and Guidelines. This has now dropped to an average of 6% as a result of the involvement of EPD in the planning process. This means that many thousands of people within the community will enjoy a much more agreeable noise climate.

Additional Measures to Abate Noise

6.74 Despite these improvements, the community in general and the Environmental Pollution Advisory Committee in particular, are of the view that government should ensure that the planning standards it has set down are achieved and that there should be a conscious effort not to allow our city to become even noisier. Government accepts this obligation. While a well-planned Chek Lap Kok airport, when in operation, will effectively remove 350,000 people, mainly in Kowloon, from unacceptable aircraft noise exposure, more remains to be done as there will be situations where past neglect and other circumstances effectively make it impossible to eliminate noise problems. This is often the case in older and less well planned communities, and while the Metroplan has provided a framework to restructure the city its beneficial results will not be felt for a long time. However, to make Hong Kong a quieter and more pleasant place to live, government intends to complete a study by 1995 to review the practicability of reducing the adverse noise impacts brought about by past neglect. The various abatement measures outlined below, some of which are yielding welcome results, will also help.

6.75 As a result of an amendment to the Road Traffic Ordinance in 1992, the Commissioner for Transport is now empowered to implement traffic management schemes on environmental grounds. The Environmental Protection Department will now consider schemes at various locations to minimise noise nuisance caused by vehicle movements at night.

6.76 Engineering solutions to noise pollution will also continue to be applied. Up to 1992/93, a total of 108 schools were provided with double-glazing and air-conditioning at a cost of $160 million under the *Schools Insulation Programme* instituted to provide an acceptable teaching environment in schools severely affected by aircraft and traffic noise. An estimated 80,000 students have benefitted under this programme. Over the next four years, all remaining schools (approximately 300) affected by traffic and railway noise will also be insulated at an estimated cost of $445 million. Where other measures have not been sufficient, the insulation of windows and the provision of air conditioners to households affected by the Western Harbour Crossing project and other Airport Core Projects, particularly in the Kwai Chung and Tsing Yi areas, will reduce to an acceptable level the noise impact of these projects on nearby residents. These measures will benefit 3,400 households at a cost of $101 million. Up to May 1993, at a cost of $24 million, ten sections of major trunk roads in the Territory were resurfaced by a porous overlay material which reduces the traffic noise. More existing road sections will be treated with this material. All new highways, particularly those associated with the airport projects, will be surfaced with this quiet material.

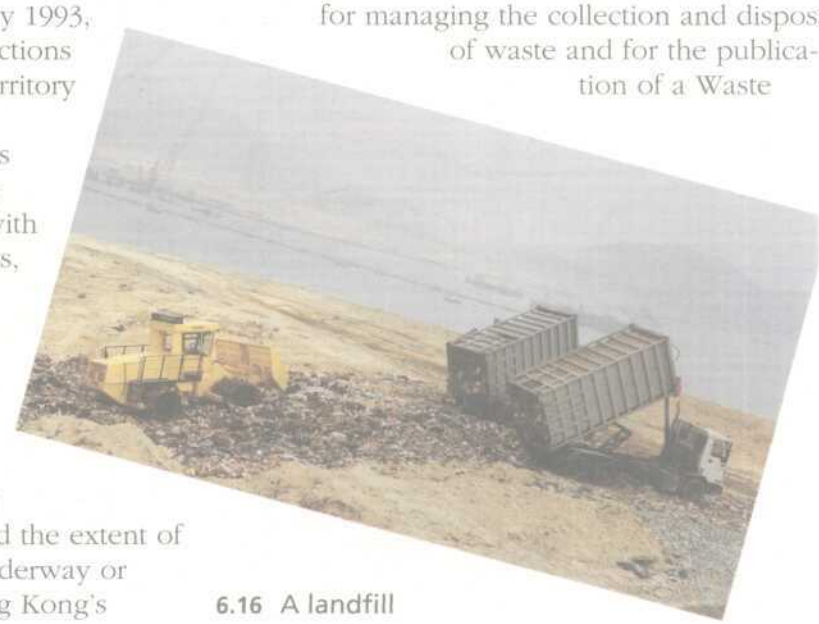
6.77 Regardless of the several measures* outlined above, the crowded nature of our city and the extent of infrastructure development underway or proposed, will mean that Hong Kong's urban areas are never likely to be as tranquil as we would like them to be. This is another reason why we must pay careful attention to the country parks programme, for the general amenities provided in these parks enable us to escape from the inevitable problems of living in so compact and dynamic a society.

* Noise in industrial buildings is controlled by the Factories and Industrial Undertakings (Noise at Work) Regulation under the Factories and Industrial Undertakings Ordinance (Cap. 59).

Waste

6.78 Each day Hong Kong produces on average 19,890 tonnes of solid wastes (not including sewage or pulverised fuel ash). This figure comprises 11,960 tonnes of construction wastes and 7,930 tonnes of municipal solid waste. Providing affordable and environmentally acceptable facilities for the treatment and disposal of these solid wastes is a challenge for Hong Kong, as providing proper waste disposal facilities is a challenge for most cities.

6.79 The Waste Disposal Ordinance (Cap. 354) (WDO) is the principal waste management law in Hong Kong. Enacted in 1980, the Ordinance sets out an overall framework for managing the collection and disposal of waste and for the publication of a Waste



6.16 A landfill

Disposal Plan (WDP). The Ordinance was amended in 1987 and 1991 to provide for the specific control of livestock waste and chemical waste. Further amendments to the Ordinance are proposed, for example, to control the import and export of waste in order to meet Hong Kong's obligations under the Basel Convention on the Transboundary Movement of Hazardous Waste and Other Waste (paragraph 9.17).

6.80 The 1989 White Paper announced that government's policy objectives for the management of wastes are to ensure:

(a) the provision, by either the public or the private sectors, of facilities for the cost-effective and environmentally satisfactory disposal of all wastes;

(b) the availability and proper enforcement of legislation to safeguard the health and welfare of the community from any adverse environmental effects associated with the storage, collection, treatment and disposal of all wastes.

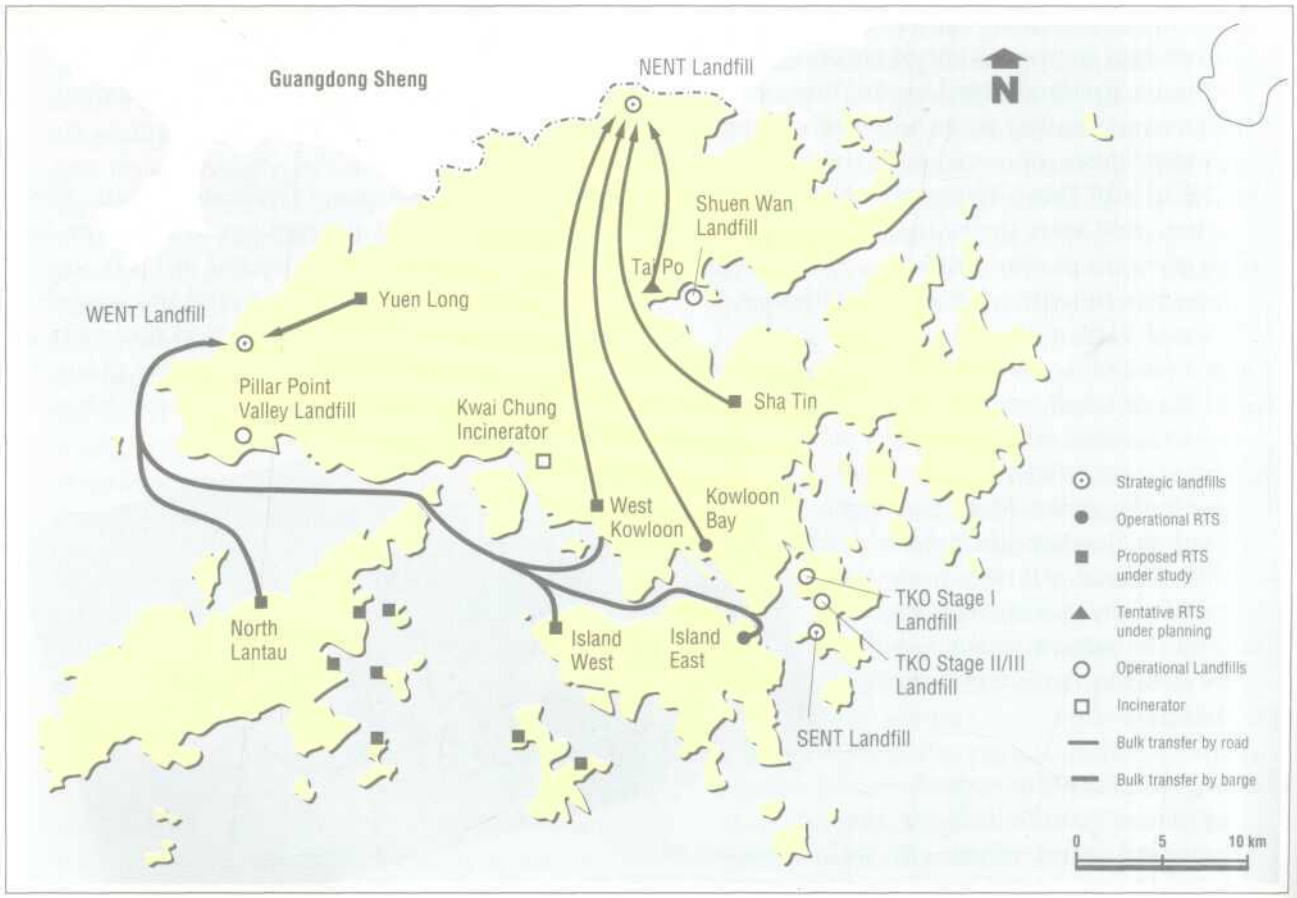
How these objectives are to be achieved is set out in the statutory Waste Disposal Plan.

Statutory Waste Disposal Plan (WDP)

6.81 The WDP, a statutory document published by the Secretary for Planning, Environment and Lands under the WDO, was approved by the Governor-in-Council on 12 December 1989. The Plan describes the infrastructural and legislative measures necessary to fulfil the policy objectives for a range of wastes arising in Hong Kong.

Solid Waste

6.82 The WDP provides for three strategic landfills, located in remote areas of the New



6.17 Waste disposal sites in Hong Kong

Territories, each serving local needs as well as receiving waste transported from the larger centres of population and industry. The sites for these facilities were carefully chosen from over one hundred potential sites, which were examined against a checklist of criteria including environmental acceptability, operational effectiveness and cost. The strategic landfills will be constructed and operated to much higher standards than the present facilities and will be provided with leachate and gas control facilities in line with international standards. The very large capacity of the landfills will enable these higher standards to be achieved at unit costs of disposal ($/tonne of waste) less than the cost of current operations. Table 6.18 lists the commissioning dates and estimated costs for the three strategic landfills.

6.83 The journeys from the urban areas to the new strategic landfills will be longer than those at present made by waste collection vehicles. Using a mathematical, computer-based model, the government has established that the most cost effective way of delivering waste to the landfills is through urban based transfer facilities where waste delivered in small payloads by collection vehicles is compacted into large containers for transport to the remote landfills. These arrangements are significantly better in environmental terms as well as being more cost-effective than the current practice of direct delivery. Marine transport will be used where possible to deliver waste from waterfront transfer facilities to the two strategic landfills that will have marine off-loading points. The marine transport system is cheaper than the road-based option, and allows containers to be stored on the vessel thereby allowing the use of a more compact site. The programme of developing transfer facilities is detailed in Figure 6.19.

6.84 The landfills that are currently in operation and those exhausted over the past two decades were not planned with an eventual use for the site after landfilling ceased, nor were leachates and gas properly controlled. A restoration programme for these old landfills has therefore been initiated to provide facilities for controlling gas and leachate and to prepare the sites for their intended afteruse. The timing and cost of this programme is indicated in Figure 6.21.

Completed projects	Commissioning date or estimated date	Capital Cost ($M)
WENT	end of 1993	2755
SENT	late 1994	3220
NENT	early 1995	1841

6.18 Dates and costs of the landfills

6.85 Having provided for secure long term waste disposal facilities through strategic landfills, the next stage of the waste disposal strategy will focus on practical measures that can

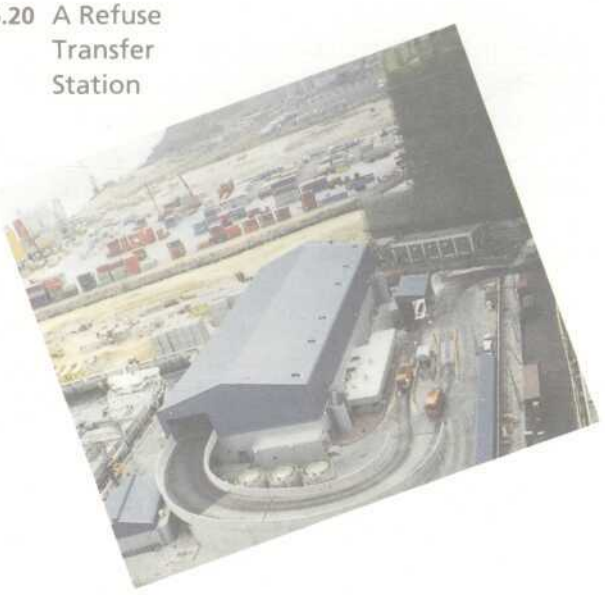
Project	Date of Commission	Estimated Capital Cost ($M)*
Kowloon Bay Transfer Station	May 1990	206
Island East Transfer Station	Nov 1992	413
Sha Tin Transfer Station	94/95	*220
Island West Transfer Station	96/97	*890
Outlying Islands Transfer Facilities	95/96	*75
West Kowloon Transfer Station	96/97	*300
North Lantau Transfer Station**	96/97	*315
Yuen Long Transfer Station	96/97	*100
Tai Po Transfer Station	00/01	*120

* All costs shown are August 92 prices.

** Only for stage I.

6.19 Dates and costs of the Refuse Transfer Stations

6.20 A Refuse Transfer Station



reduce the amount of wastes requiring ultimate disposal. Such measures will extend the life span of the strategic landfills. In this connection, the government plans to commission a study on "Bulk Waste Reduction" before the end of 1993. The study will identify practical means to facilitate waste prevention, minimisation, reuse, recovery and recycling in the Territory. In addition, a comprehensive review will be conducted to assess the merits and suitability of various bulk waste reduction technologies, including amongst others the appropriate application of incineration processes in Hong Kong.

6.86 Solid waste covers a wide range of materials, some of which have constituents or properties which make them unsuitable for disposal through transfer stations and landfills. A number of facilities will deal with these special wastes, which include chemical, clinical and radioactive wastes. The programme for the provision of these facilities is at Figure 6.22, and a description of each facility is provided in the next few sections.

Chemical Waste

*6.87 The Waste Disposal (Chemical Waste)(General) Regulation made under the WDO to control chemical waste was enacted in January 1992. Starting in November 1992, chemical waste was brought under control in phases under the Regulation. Chemical waste producers are required to register with the Environmental Protection Department and to provide suitable packaging, labelling, and storage for their waste. The movement of each consignment of chemical waste must be carried out by a licensed collector and recorded in a triplicate form (the trip-ticket) to ensure that the waste is delivered to a licensed facility for disposal. This "cradle-to-grave" control scheme ensures that chemical wastes are disposed of in an environmentally satisfactory manner.

*6.88 In light of the predominance in Hong Kong of small waste producers, and because of their practical difficulties in managing chemical waste, the government has developed the integrated Chemical Waste Treatment Centre (CWTC) to provide centralised treatment of chemical waste generated in Hong Kong. The CWTC can collect and treat up to 100,000 tonnes annually of chemical waste. Construction of the CWTC was completed in December 1992 and, after testing, it was commissioned in April 1993.

Project	Date of Comm. of Restoration Works	Estimated Restoration Cost ($M)*
Ma Yau Tong West Landfill	96/97	34
Ma Yau Tong Central Landfill	96/97	63
Jordan Valley Landfill	96/97	78
Ngau Chi Wan Landfill	93/94	1
Gin Drinkers Bay Landfill	96/97	78
Ma Tso Lung Landfill	97/98	9
Ngau Tam Mei Landfill	97/98	9
Siu Lang Shui Landfill	97/98	54
Pillar Point Valley Landfill	97/98	236
Shuen Wan Landfill	96/97	245
Tseung Kwan O Landfill	96/97	540

* All costs shown are August 92 prices

6.21 Landfill restoration programme

Facility	Estimated Capital Cost (M)	Estimated Recurrent Cost (M)/annum	Target Commissioning Date
CIF	143	20	June 96
IWSF	63	Note (1)	March 95
BWRF	1662	Note (2)	March 99

Note (1) Facility to be operated by Department of Health

Note (2) Cannot be estimated at the present stage
Feasability study required

Not WP inititative, decision to proceed depends on funding

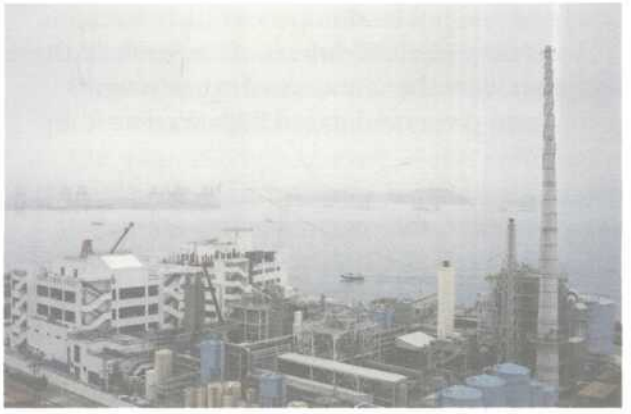
CIF Centralised Incineration Facility

IWSF Isotopic Waste Storage Facility

BWRF Bulk Waste Reduction Facility

6.22 Other waste disposal facilities

Full control on all categories of chemical waste began at the same time, thus providing comprehensive arrangements for the control and disposal of chemical waste. Government proposes to introduce a progressive charging scheme for the use of the CWTC in 1994.



6.23 Chemical waste treatment centre

6.24 Acceptable and unacceptable loads of construction waste

Construction Waste

6.89 A continuing problem exists with the disposal of construction waste in Hong Kong. This is due to the rapid increase in the amounts of construction waste being disposed of at landfills since the formulation of the WDP. Almost 12,000 per day of construction waste are being disposed of at landfill, an increase of 150% since 1989. Most of this inert material should be disposed of at public dumps for reclamation purposes; by occupying valuable space in existing landfills — space which should be reserved for putrescible materials — an early shortage of disposal capacity prior to the commissioning of the new strategic landfills has been created.

*6.90 With effect from 1 October 1992, government therefore relaxed the restrictions imposed on materials presented for dis-

posal at public dumps and increased the number of such dumps. As a result of these measures the amounts of construction waste presented at landfills decreased by 25%.

6.91 However, the remaining 75% still being presented at landfills is considered excessive and further measures are proposed to persuade the building industry to separate its waste at source into materials that can only be disposed of at landfills and materials which are suitable for public dumps. Properly separated, about 75% of waste from construction sites is considered suitable for use at public dumps. As the three new strategic landfills will not accept construction waste, the Environmental Protection Department will liaise with the construction industry with a view to persuading the industry to use public dumps, and to recycle and to reuse materials, so that the industry will be in a position to meet the disposal requirements.

*6.92 To minimise the quantity of wastes presented for disposal at landfills, and to follow the Polluter Pays Principle, one option would be to introduce, in phases, charges for wastes disposed of at government run landfills. Privately collected waste, of which construction waste is a major component, will be the first type of waste to be subject to charges. In order to provide better controls on the handling and disposal of construction waste, it may be necessary to introduce regulations to promote the sorting and use of construction waste at public dumps. In addition, it is considered that existing control measures need to be strengthened to deter possible fly-tipping activities when landfill charging is implemented.

Clinical and Difficult Wastes

6.93 The majority of clinical waste (over 70%) is currently disposed of at landfills and municipal incinerators; the rest is disposed of at incinerators on hospital premises. However, the design of many hospital incinerators does not take into consideration the control of air emissions. As a result, their emissions to the atmosphere are not acceptable if air pollution is to be adequately controlled. Pathological incinerators (including those used in hospitals) have therefore been included under the Air Pollution Control (Amendment) Ordinance as one of the Specified Processes and Best Practicable Means will be required to control their emissions.

6.25 A public dump

6.94 In addition, the 1989 White Paper and the WDP proposed the construction of a purpose-built Centralised Incineration Facility (CIF) to deal with these wastes more effectively. Besides dealing with the clinical wastes — including those generated by the private sector — the facility will handle other difficult wastes, such as animal carcasses which are currently disposed of in an unsatisfactory manner. A consultancy is underway to examine the feasibility of the proposed facility and to make recommendations regarding its size and capabilities. In the meantime, a code of practice for the handling and disposal of clinical waste is under discussion with the Hospital Authority. In addition, a programme to phase-out existing hospital incinerators is being drawn up and will be implemented after the new facility is commissioned.

Radioactive Waste

6.95 Radioactive waste is not a serious problem in Hong Kong. Nevertheless, for the small

amounts which do exist, proper facilities are needed. As all radioactive waste in Hong Kong is low level, comprising principally medical and industrial elements, the sort of measures which are needed in countries which have nuclear reactors are not necessary here. However, a small storage facility will be constructed to keep the waste in a secure condition until it has deteriorated naturally to such an extent that its safe disposal at a landfill can be carried out. The process to identify a suitable location for this facility has started.

Floating Refuse

6.96 The amount of floating refuse in the central harbour — which is the focus of our community and an important tourist attraction — is unacceptable. In a bid to improve the existing standards of refuse collection and scavenging services currently operated by the Marine Department, responsibility for these activities will be contracted out to professional waste collectors in the private sector. The contractor will be paid on the basis of the amount of refuse collected and this will constitute a strong incentive to perform efficiently and to increase the amounts of such refuse collected daily. The contracting out exercise will be completed in 1994. The Private Sector Committee on the Environment assisted in devising these new arrangements for scavenging floating refuse.

Livestock Waste

6.97 Controls on livestock wastes are provided for under the WDO and, since 1988, there has been a ban on keeping livestock in designated urban areas and a phased programme of progressive controls on livestock keeping in other areas. Since the implementation of these arrangements — and the growing use of such cleaner livestock rearing methods as the 'pig-on-litter' scheme — the pollution of some rivers and streams by livestock wastes has been curtailed. However, livestock waste remains a major source of pollution to our inland waterways, especially in the New Territories. This pollution can no longer be tolerated. The government has therefore reviewed the LWCS and, after prolonged consultation with the local farming community, has decided to introduce a scheme to license livestock farms in order to regulate livestock keeping and to ensure effective controls over livestock waste.

6.98 The government will provide additional financial assistance so that those farmers who wish to remain in the business can install environmentally acceptable waste treatment facilities on their farms and thereby meet the improved environmental requirements of the licensing scheme. A total of $910 million will be made available over the next 5 years, including $130 million for the installation of treatment facilities and for *ex gratia* assistance, and $130 million for low interest loans to assist those farmers who wish to install pollution control measures so that they can fully comply with the Livestock Waste Control Scheme. Legislative amendments to the WDO and the Public Health (Animals and Birds) Ordinance will be submitted to the Legislative Council in 1994. As a further measure to reduce pollution from livestock wastes, the phased programme controlling livestock farming throughout the Territory will be accelerated so that, by 1 June 1994, the whole Territory will be covered by the LWCS. To

6.26 Floating refuse in Victoria harbour

avoid incompatible land uses, the prohibition areas will also be expanded to cover New Town areas, rural townships, Port & Airport Development Strategy (PADS) areas and areas of high grade recreational value The licensing scheme, together with strengthened enforcement procedures, will effectively put the livestock waste pollution problem under proper control, thus bringing about substantial improvements to the water quality of many rivers and streams in the New Territories.

6.99 The various areas of activity described in Chapters 5 and 6 illustrate that the government is moving along a broad front to protect many features of Hong Kong's environment and is using a wide range of measures — capital, legislative, advisory — to clean up Hong Kong's environment.

STEP 3

SUSTAINING OUR ENVIRONMENT

CHAPTER 7

PRE-EMPTING THE PROBLEMS

PLANNING TO PREVENT ENVIRONMENTAL PROBLEMS

7.1 Chapters 5 and 6 described how government is working on a broad front to tackle pollution from many sources. These measures are necessary to combat years of environmental abuse. Because this abuse had been tolerated for too long and because, like many communities, we were slow in moving to protect our environment, we are now having to proceed at considerable speed to make up for years of neglect. The comprehensive programme of environmental measures outlined in Chapters 5 and 6 are not without substantial costs. There are other costs associated with pollution but some of these costs are hard to measure — such as the cost to health because of inadequate air quality, or the effect of noise on our general well-being. However, the costs of providing the many items of physical infrastructure — facilities for collecting, treating and disposing of sewage, solid and toxic wastes, and for abating noise — are known. These are substantial costs on the community, whether they are met by government, or directly by the community through the application of user charges.

7.2 Because of these costs — whether to the community's health or to its pocket — more consideration must clearly be given to preventing pollution problems, rather than curing them, as this will help reduce the cost to the community of dealing with such problems. Prevention rather than cure will also contribute to our obligations of stewardship and towards sustainable development. This Chapter therefore examines the various measures that are being considered to prevent pollution and environmental degradation — whether these measures are being pursued by government, industry or the individual — and suggests additional measures for action.

Land Use Planning

7.3 In the 1989 White Paper, it was acknowledged that "serious environmental pollution in Hong Kong is an unfortunate by-product of economic success and population growth". One of the government's major priorities has therefore been to halt this environmental decline and to begin fundamental improvements to our environment. Environmental considerations are now incorporated into the early stages of planning and development projects to maximise the opportunities for achieving a satisfac-

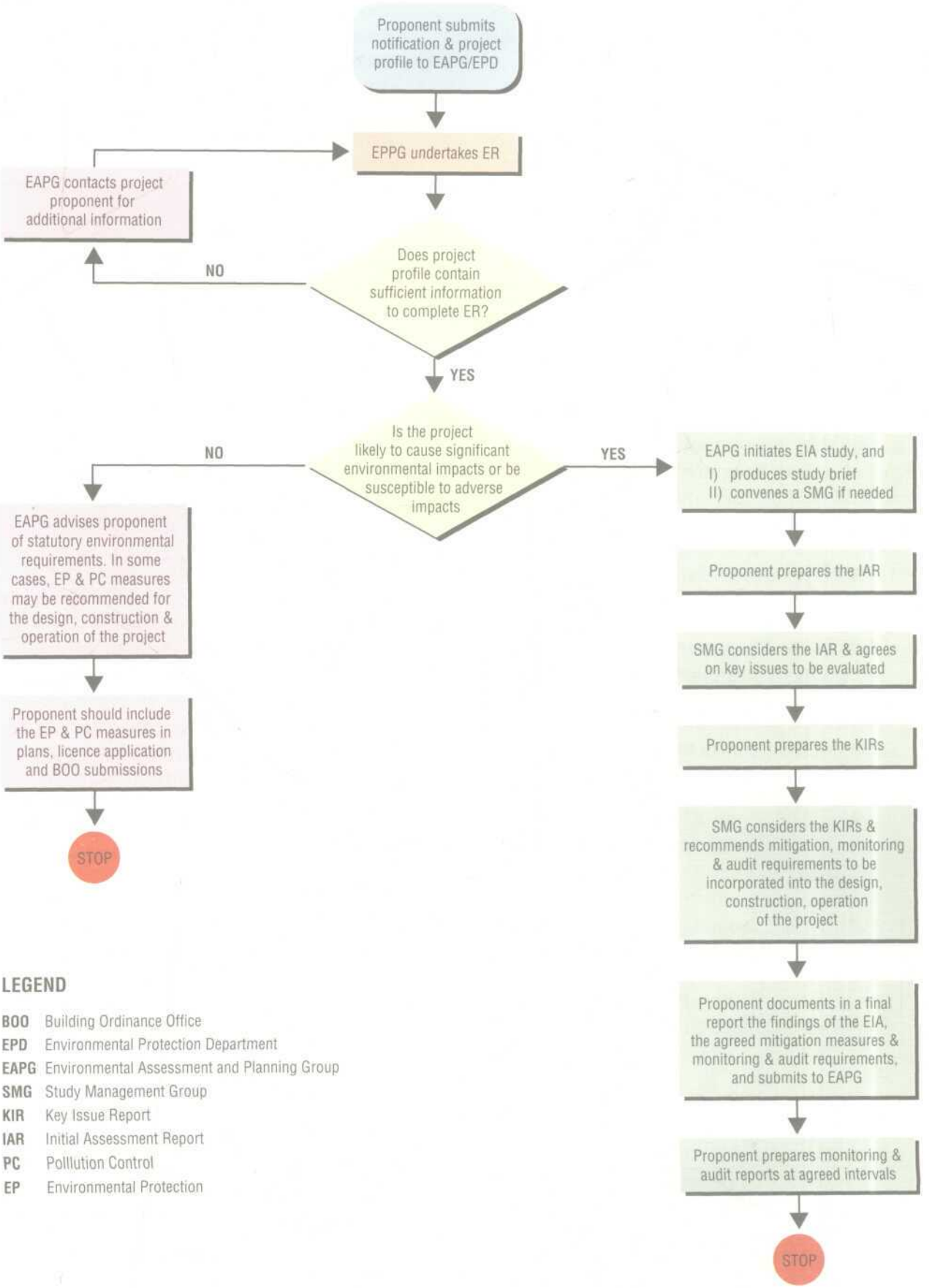
tory environment. A new chapter dealing with environmental planning considerations was therefore added to the Hong Kong Planning Standards and Guidelines(HKPSG) in 1985. More recently the chapter was revised and published (Environmental Guidelines for Planning in Hong Kong, 31 August 1990) and is used to guide planners and developers towards a satisfactory environmental performance when locating and designing projects. In addition, all planning and development proposals are now scrutinised by the Environmental Protection Department and the Director of Environmental Protection is a member of the Town Planning Board. While these environmental planning guidelines are useful in dealing with the environmental implications of general planning and development proposals, other tools are used to address problems that may be caused by major public and private sector development projects.

Environmental Impact Assessment Procedures

7.4 Many projects have the potential to cause environmental problems because of their impact on the environment or because they locate sensitive receivers near a source of pollution. These problems are exacerbated in Hong Kong's crowded environment which is also witness to constant development and redevelopment. The potential environmental consequences of major projects therefore need to be considered at all steps of project planning in order to prevent pollution problems, to minimise environmental damage and to avoid expensive remedial measures. The procedure for fulfilling these objectives is known as Environmental Impact Assessment (EIA). EIAs have been conducted on an ad hoc basis for major public and private sector projects from as early as 1978. Since 1987, as a result of an internal government administrative directive, EIAs have been mandatory for all major public projects. Since 1987, EIAs have also been required for all major private sector projects, either through requirements in lease conditions for the land involved, as a result of planning approval conditions or, more commonly, as a result of negotiated agreement An advice note is available to developers on when EIAs are required and the procedures to be followed

7.5 The EIA process focuses on the siting, construction and operation of major development projects which may have a significant environmental impact. The proponent of a project is required to notify the Environmental Protection Department of the proposal, and to provide a detailed project profile to enable the department to conduct an initial environmental review. If the Environmental Protection Department confirms that the project will have a significant impact, an EIA study brief will be provided by the department to the proponent so that a more detailed environmental assessment can be prepared. The Environmental Protection Department oversees the carrying out of the EIA by the proponent's consultants and reviews the findings and recommendations of the study, often with the assistance of other government departments. Should any dispute arise with the proponent on incorporating recommended mitigation measures into the design of the project, or should the Director of Environmental Protection form the view that the project ought not to proceed due to the seriousness of its environmental implications, the matter is referred to the Secretary for Planning, Environment and Lands for resolution. The Environmental Pollution Advisory Committee (EPCOM) is also consulted on the findings of EIA reports and, since April 1992, members of the public have access to EIA reports relating to public projects. Private sector proponents are also encouraged to make EIA reports on their projects available to the public.

7.6 Apart from serving to increase public awareness of environmental issues, the EIA procedures described above have resulted in significant environmental benefits. In virtually every case the environmental performance of projects subjected to EIA studies has been greatly improved: pro-



LEGEND

BOO Building Ordinance Office
EPD Environmental Protection Department
EAPG Environmental Assessment and Planning Group
SMG Study Management Group
KIR Key Issue Report
IAR Initial Assessment Report
PC Polllution Control
EP Environmental Protection

7.1 Issues considered by EIA

posed power stations have been better located and their emissions more carefully controlled; proposed major roads have been re-routed, covered or placed in tunnels to avoid serious noise problems; land uses for new reclamations has been re-arranged to avoid inappropriate adjacent land uses; construction impacts of projects have been minimised; and the design of major new residential developments has been optimised so as to avoid excessive traffic noise or air pollution problems. In one case, dredging in Mirs Bay and in areas around the Sai Kung coastline to obtain marine sand for use in construction was dropped altogether after the EIA showed that the impact on the marine environment would be unacceptable.

EIA Legislation

7.7 Despite the success of these measures, as they rely on administrative arrangements and persuasion, they are not without their difficulties. The government therefore proposes to introduce legislation to make EIAs for major development projects a statutory requirement. It is intended that close interface with the Town Planning Ordinance, which is currently under review, will ensure that the environmental impact of such projects will be properly addressed in the planning process so that appropriate mitigating measures can be implemented. The legislation will also provide for detailed public consultation as part of the EIA process, and for the public to have the right of access to EIA reports. It is envisaged that the EIA legislation will be introduced to the Legislative Council in the 1993/94 session.

Environmental Monitoring

7.8 Monitoring of air quality is carried out by the existing network of air quality monitoring stations strategically located throughout the Territory to assist in the development of policies on air pollution control. Similarly, there are points throughout Hong Kong for monitoring water quality in harbours, rivers and streams, and at bathing beaches. Environmental performance monitoring of major development projects is also conducted by the project proponents as one of the requirements in their construction contracts However, it is recognised that in some areas — where there are a number of construction projects in progress or being planned — it is necessary to monitor the cumulative environmental impacts of these projects. For this purpose, in August 1992 an Environmental Project Office (ENPO) was set up in West Kowloon, where several Airport Core Projects are taking place. A second ENPO for the Kwai Chung and Tsing Yi areas was set up in September 1993. The need for such project monitoring in other areas will be considered.

Environmental Auditing

7.9 Environmental assessments need not be limited to major development projects and can be applied to a broad range of commercial and industrial activities. Environmental audit is a comparatively recent concept whereby the activities of an organization are carefully audited to identify what environmental impact these activities have, and how such an impact can be overcome, or at least mitigated. A further advantage of environmental auditing is that it tends to enhance the environmental awareness of employees and others participating in the audit.

7.10 The government will therefore encourage environmental auditing as much as possible and wishes to set an example where it can. To this end, consultants have been appointed to undertake a pilot environmental audit of two government departments to assess the value of these audits in the public sector context, and to devise procedures for extending environmental audits to all parts of government. The audit started in October 1993 and is scheduled to finish in May 1994. To ensure that the audit measures are properly introduced the government proposes to appoint "green managers" in all government departments.

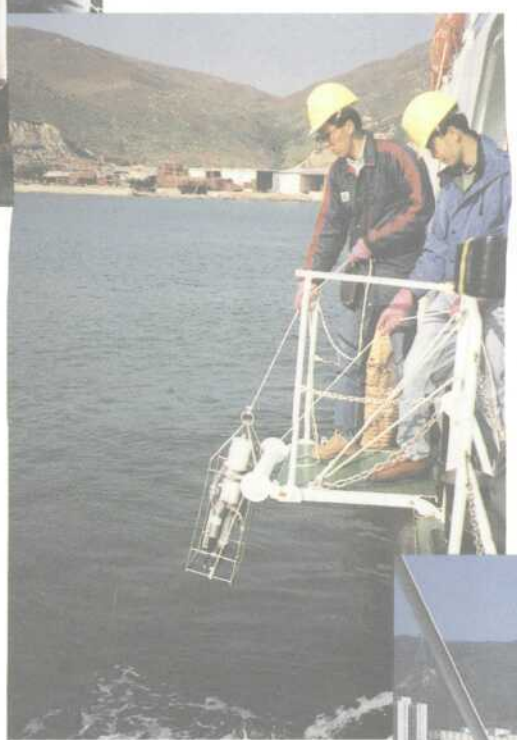
7.2 EPD staff carrying out monitoring work

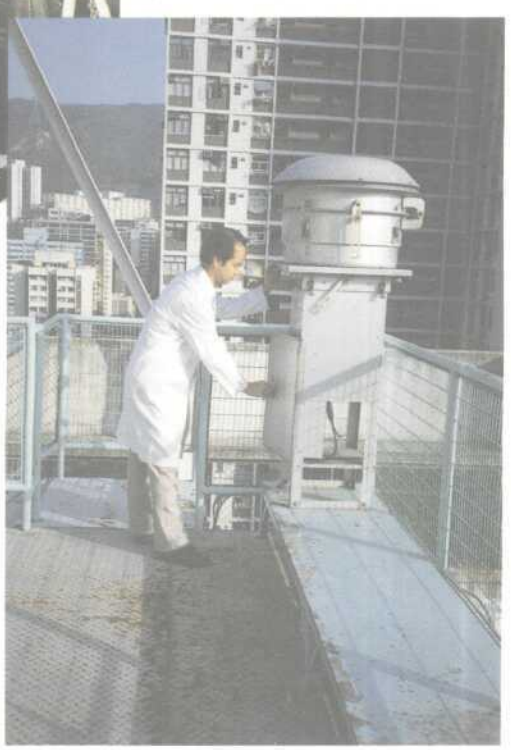
Environmental Auditing in the Private Sector

7.11 Several guides to environmental auditing are available. In November 1991 a major brewery launched an environmental audit manual and some 400 copies of the manual have been distributed to manufacturers associations, consultants, educational institutions and industrial and commercial concerns in the private sector. The Environmental Protection Department has also established a directory of consultants with appropriate expertise in carrying out environmental audits.

7.12 A 'do-it-yourself' environmental audit manual has been produced by a well-known cosmetics outlet to help small companies and organisations audit their operations so that they are less harmful to the environment. The 24-page bilingual manual is easy to read and features a series of checklists on such topics as energy efficiency, staff training, pollutants in the workplace and the use of hazardous materials. This manual is acclaimed as the most practical and user-friendly guide yet published in this field. It was launched at the Prince of Wales Business Leaders Forum meeting in Hong Kong in November 1992 and was subsequently put on sale.

7.13 The Environmental Campaign Committee (ECC) has produced an *'Industrial Pollution Prevention Self-Checking System for Small Factories.*" The project, at a cost of $130,000, was funded by the ECC through a donation from the Royal Hong Kong Jockey Club. The checklist was produced on behalf of the ECC and the Federation of Hong Kong Industries by the Centre for Environmental Technology. In July 1992, the checklist was distributed to some three thousand industrial undertakings throughout the Territory, including bleaching, dyeing, electroplating and electronic industries.





防止工業污染自行檢查程序手冊

自行檢查程序是甚麼？

要解決污染問題，首先要清楚了解污染的成因與情況。假如閣下是小規模製造商的僱主或經理，我們希望透過這份小冊子中的自行檢查程序幫助閣下找出污染的問題所在，並希望提醒閣下注意貴工廠的生產活動有否對環境造成影響。

自行檢查程序的優點是能讓閣下從不同的生產過程中找出污染的來源；並為閣下提供有關工業污染的資料及解決辦法建議。

自行檢查程序有甚麼好處？

(一) 提供資料　提高警覺

- 資料提供包括有關環境污染的成因；及
- 提醒閣下注意貴工廠的生產活動對環境造成的影響；
- 提醒閣下制訂政策時應注重環境管理；及

(二) 警覺越高　經作越好

- 提醒閣下要記並遵守政府條例及其它可靠的勸告；
- 減低生產活動對環境、員工健康及安全的威脅。

(三) 經濟與環境　同樣會受益

- 使用自行檢查程序可幫助閣下省去不必要的開支。同時，亦可對保護環境作出貢獻。

(四) 形像更好　聲譽提高

- 實行自行檢查程序時不單可以提高員工的士氣和生產力；更可藉着對環保的貢獻，來同差提高貴公司的形像和公共關係。

如何使用自行檢查程序

假如閣下是僱主、經理或各階層技術或非技術人員，閣下必定要認識這個自行檢查程序。

這個自行檢查程序是以一個流程圖的形式設計，與貴工廠的生產活動相似，閣下請隨箭號指示（即卸下原料）開始，順步自行檢查，至終點（即運送製成品往買家或用家）為止。

當完成這個自行檢查程序後，環境技術中心例後會發出評價問卷，敬請填妥並寄回本中心，多謝合作。

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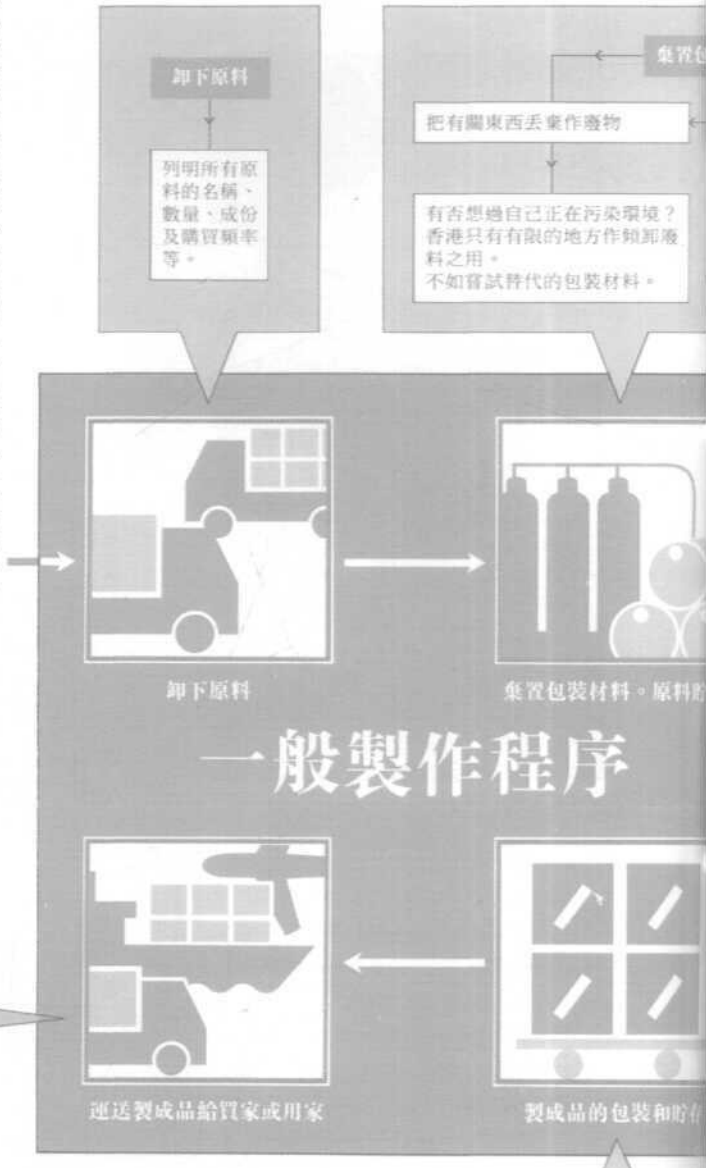
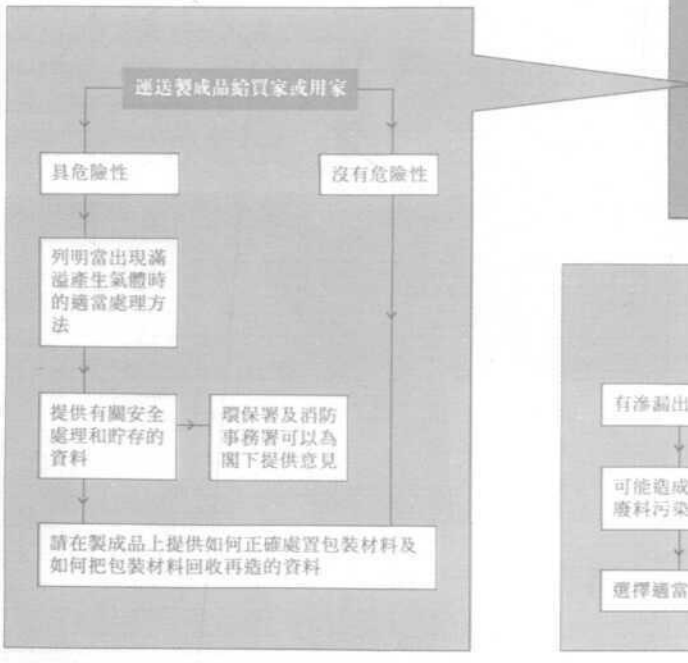
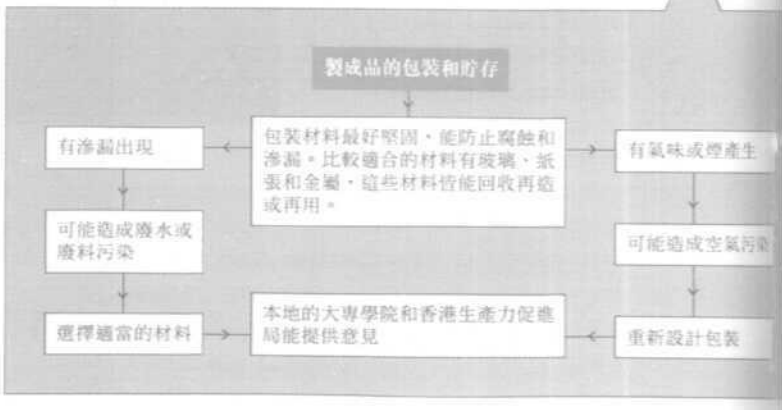
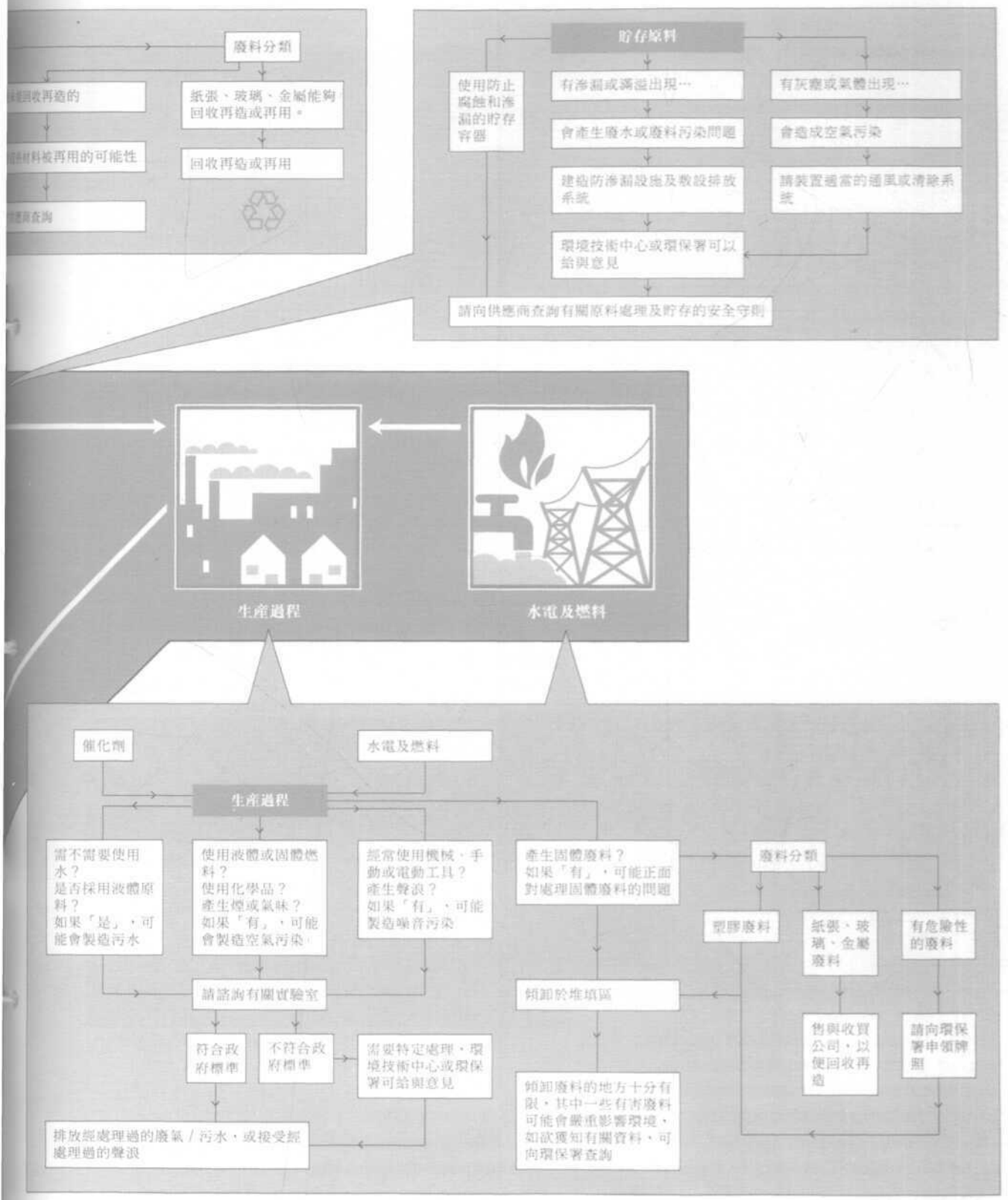






防止工業污染

7.3 ECC check list



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Waste Avoidance

7.14 Chapter 6 described the substantial amounts of wastes that our community produces every day, and the significant plans that are necessary to deal with these wastes in an environmentally acceptable and cost-effective manner. Clearly, because of these costs, steps must be taken to ensure that these expensive but necessary waste disposal facilities last as long as possible. This section of the Review will therefore examine measures for reducing a broad range of wastes.

Recycling

7.15 The overall objective of waste management is to reduce waste at source — the EIA and environmental audit procedures outlined above will contribute to this aim — and then ensure that what remains is recycled or reused before what cannot be reused in this way is disposed of in an environmentally cost-effective manner. However, in Hong Kong there are many constraints to applying these processes. For example, many premises — domestic, commercial or industrial — have limited space in which to sort and classify wastes so that they can be recycled or reused. Moreover, land which is required for sorting and recycling is a scarce and expensive resource in Hong Kong.

7.16 Nevertheless, the level of recycling of wastes in Hong Kong — particularly from the domestic stream — is higher than in most cities. For example, some 36% of the waste stream is extracted for recycling, by export or by domestic reprocessing, and this saves substantial costs that would otherwise be associated with the disposal of these wastes. The annual level of recycling of certain items is especially high; paper — 510,000 tonnes; ferrous metals — 400,000 tonnes; non-ferrous metals — 163,000 tonnes; plastics — 241,000 tonnes. The result of this activity is that most items which can be readily extracted from the waste stream for recycling have already been extracted, that is, we have "picked all the low fruit". Extending recycling activities for additional items will not therefore be easy. It will require a thorough assessment of the technical feasibility of recycling schemes, and of the markets and commercial viability of recycled products.

7.17 In addition, and even where these physical constraints do not apply, there may be other difficulties. For example, it is simply not economically viable — or even environmentally sensible — to recycle some forms of waste because the amount of energy needed to store, collect , transport and process materials is greater than that needed to manufacture a virgin product. Furthermore, there has to be a viable market for the item recycled and in many cases such markets do not exist Because of these difficulties, and because our recycling rate is already comparatively high, the government is hesitant to set higher targets. However, the government is trying to encourage recycling where it can because, apart from conserving valuable landfill space, recycling contributes to reduced production costs and reduces the amount of energy needed for production and transport.

7.18 The government has therefore set an example when it comes to recycling and has, since 1990, been promoting paper recycling because there is a well established market for exporting paper waste for recycling overseas and because, more recently, paper-recycling plants have been established in Hong Kong. Over 60 government branches and departments have initiated schemes to collect waste paper separately from other waste. It is estimated that these arrangements have so far saved about 30,000 trees.

7.19 The government has also encouraged similar schemes elsewhere — some thirty public housing estates and more than 450 private establishments (including schools, commercial offices, banks, hotels and utility companies) are now involved in paper recycling schemes and this number is growing all the time. To facilitate these measures comprehensive guides on how to start a waste paper recycling programme in

7.4 Recycling activities

residential buildings and offices were prepared and distributed to the public. Specific technical advice on waste paper recycling is obtainable through a telephone enquiry service operated by the Environmental Protection Department.

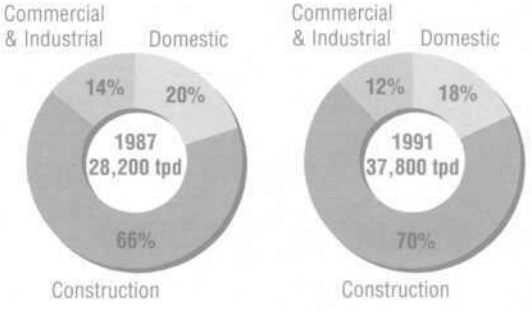
7.20 The recycling of waste plastics is limited to relatively clean scraps and rejects from manufacturing sources. No reprocessing of post-consumer plastic packaging waste such as polyethylene terepthalate (PET) bottles and plastic bags is undertaken due to the constraints mentioned above. The government has, however, identified the excessive use of plastic bags as an aspect where waste could be reduced. Hence, in its environmental publicity campaign, the government has appealed to the public to use fewer plastic bags.

7.21 Construction waste accounts for more than

60% of all solid wastes disposed of at landfills and this has brought about the shortfall of landfill capacity currently experienced in Hong Kong. In 1991 the government commissioned a study on recycling construction waste received at landfills. The study concluded that setting up a recycling facility is technically feasible and in 1992 a six-week trial on construction waste recycling was conducted at Tseung Kwan O Landfill. The Environmental Protection Department is now discussing with the construction industry how to promote more sorting and separation of construction waste at building sites as well as setting up construction waste recycling centres.

Understanding recycling — government

7.22 To improve our understanding of recycling, in 1993-94 the government will conduct a consultancy on bulk waste reduction to examine the feasibility of various kinds of waste sorting and reduction facilities. The government will also acquire an improved and flexible computer based planning tool to replace the existing Waste Management Model which was used for the development of the current Waste Disposal Strategy. The new tool will be capable of evaluating the effects of waste minimisation and recycling as well as the effect of charging on waste delivery and disposal patterns. A new Waste Disposal Plan can then be drawn up for better management of municipal waste in terms of cost-effectiveness and environmental acceptability.



7.5 Waste generation in 1987 and 1991

Understanding recycling — the public

7.23 Each person in Hong Kong produces about 2.0 kilograms of waste per day (in 1991), compared to about 1.7 kilograms in 1987. Wastes are produced in the following proportions (1991 figures):

5,575 tonnes per day	domestic
1,828 tonnes per day	commerce/ industrial
16,374 tonnes per day	construction

7.24 Clearly, to have any meaningful impact, waste minimisation must be a "community activity", not just an activity for one sector, and to get the community broadly involved requires a level of understanding on what is involved in waste minimisation. Essentially, there are four steps and these are known as the 4Rs — **R**educe, **R**ecover, **R**euse, **R**ecycle.

7.25 **Reduce**: this means reducing waste at source by not producing it in the first place. This can be done by choosing reusable items over throwaway items and by careful design, especially for packaging.

7.26 **Recover**: this means the extraction of economically worthwhile components from the waste stream. Examples are the recovery of material through recycling, the recovery of energy from landfill gas, and the recovery of energy from waste.

7.27 **Reuse**: this means repeated use of an item rather than throwing it away. Examples are choosing reusable items such as refillable soft drink bottles, replaceable blades and refillable pens.

7.28 **Recycle**: this means taking apart an old product and using the material it contains to make a new product. The new product may be identical to the old, e.g. used glass containers can be melted down and turned into new glass containers. Another type of recycling, often called secondary recycling, creates a different kind of product from the original, e.g. converting used plastic products into garden furniture.

Environmental Campaign Committee

7.29 The government has sought to extend the 4Rs message through the activities of the ECC as one of the several campaigns conducted by this committee to raise the level of environmental awareness in Hong Kong. The themes the ECC chose for its recent campaigns included "waste reduction" and "green consumerism", and in 1991 it also organised a project on waste paper collection in public housing estates. The ECC has published leaflets on waste paper recycling from the home and office and these are available at District Offices.

Municipal Councils

7.30 Given the important role the Urban Council and Regional Council play in collecting and transporting domestic and some commercial wastes, there is scope for involving the two Councils in programmes to reduce the amounts of such wastes going for final disposal. The government will therefore examine such measures with the Councils. Those measures which may be considered include mandatory waste separation of targeted types of recyclable wastes and the provision of specially designed receptacles for separate collection of recyclable wastes by the Councils.

Private Sector

7.31 The private sector will need to play a role in waste avoidance — by reducing construction waste and by reclaiming industrial solvents for example. With the commissioning of the new strategic landfills, the landfill operator will accept only construction waste containing no more than 20% by volume of inert material (such as sand, soil, rock, rubble, concrete, reinforced concrete, brick, asphaltic concrete and cement mortar). This is to ensure that such inert material can be put to beneficial use for land reclamation, and at the same time to safeguard the lifespan of the strategic landfills. In addition, the leachate and landfill gas management systems installed at the strategic landfills will be inefficiently utilized if disposal of construction waste at landfills remains uncontrolled

7.32 Another area where improvement is expected is solvent reclamation or solvent exchange. When the Chemical Waste Treatment Centre (CWTC) opened in April 1993, opportunities for recycling industrial solvents delivered for disposal at the facility increased because the CWTC contractor is encouraged to recycle such wastes as a means of disposal.

7.33 A further area where there is scope for improvement is the recycling of plastic scraps. Collection mechanisms for plastic bottles, leading to their recycling, are in place in other countries, notably in Taiwan, Germany and France. Similar schemes are being studied in Hong Kong and while the initiative to establish them should come from the private sector — in line with government's overall policy on recycling — the government will consider ways in which schemes could be introduced to make producers take responsibility for their own products, thus introducing cradle-to-grave controls on wastes. The government will also investigate the feasibility of fiscal measures designed to tip the economic balance away from the use of virgin products and towards the use of recycled ones.

7.34 A particular example of where the private sector has become successfully involved in recycling is in the collection, refurbishment and resale of laser printer cartridges; recycled cartridges are on average 20% cheaper than new ones. In 1992, about 35,000 cartridges were recycled, 40% of which were consumed locally and 60% were exported.

Pulverised Fuel Ash

7.35 Pulverised Fuel Ash (PFA) is a waste product of coal-fired power stations. The current annual production of PFA in Hong Kong is about one million tonnes, and this is likely to increase. Approximately one third of this

annual production is stored in purpose-built ash lagoons. The balance has been disposed of by use in concrete production or as fill material above the water table. The value of PFA as a partial replacement for cement has been internationally recognised for some time, and used in numerous projects in Hong Kong. There is much greater potential for using this material than is currently the case and this is being actively promoted by government. Through the Fill Management Committee, the government has encouraged the wider use of PFA as fill material for land formation works. Guidelines on how this should be done and a Works Branch Technical Circular have been issued to government departments and engineers. A technical review by the Civil Engineering Department concluded that the engineering performance of PFA is similar to that of other reclamation fill materials commonly used in Hong Kong. Government policy is therefore to promote the use of PFA in concrete as a first priority and to use as much of the remaining PFA as practicable as reclamation fill in government projects.

7.6 A PFA lagoon

Clean Production Technology

7.36 The level of use of clean production technology in Hong Kong's manufacturing industry is at present low because industry has so far had limited exposure to clean technology information. Nor has there been any substantial pressure from industries' clients to use clean technology. However, switching to clean production technology may bring advantages:

(a) **Increased competitiveness**: from a long term perspective, using clean production technologies often leads to lower production costs and increased competitiveness.

(b) **Increased productivity**: the use of raw materials can be made more efficient resulting in an increase in productivity.

(c) **Waste minimization**: factories can reduce, or even eliminate, wastes produced in the manufacturing processes.

(d) **Compliance with customers' demand**: there is an increasing trend for customers to demand environmentally-friendly products. Clean production technologies can help factories meet such demands.

(e) **Enhancement of product and company image**: use of clean technologies can upgrade the quality of a company's products and enhance its image.

7.37 It is therefore important that Hong Kong's manufacturing industry reviews its production processes to consider how clean production technology could be introduced. There is at present insufficient knowledge and experience about clean production technology in Hong Kong. While overseas experience will be useful in this respect, it will need to be modified to suit production arrangements in Hong Kong.

7.38 The government is therefore examining how long-term research and development in clean technology can be undertaken in Hong Kong. The Industry Department's recent consultancy study to assess the current level and mechanisms of support to industry on environmental matters examined this matter. The study's recommenda-

tions are now being considered by government (para 10.17)

Waste Minimisation Strategy

19 While a broad range of recycling activities already exists in Hong Kong — and while many items in the waste stream are recycled at higher levels than in many other cities — the government is aware that there is a need for an overall strategy for waste minimisation. In developing this strategy we will take account of the economic costs of recycling and waste minimisation compared to the costs of production and waste disposal. A reasonable balance will be sought. We believe the strategy should also reflect the Polluter Pays Principle and the need for a strategic plan for waste avoidance. For the Polluter Pays Principle, charging will be introduced for the treatment of chemical waste, for the disposal of wastes (starting with privately collected waste) at landfills and for sewerage services. The Environmental Protection Department's consultancy study on bulk waste reduction will be tasked with a comprehensive review of advanced waste reduction technologies, with trial schemes of waste recovery, recycling and reduction, and with developing a strategic plan for waste avoidance. The study is planned for completion in phases from 1995-96.

CHAPTER 8

ENERGY EFFICIENCY AND CONSERVATION

Energy is the life-blood of modern societies. Practically every facet of our daily lives is conditioned by the need for energy. Between 1983-1992, our demand for energy increased at the average rate of 7.7% per annum. However, while a reliable supply of energy is important to the continued well being of our community, the present rate and manner with which we exploit energy by burning fossil fuels, such as coal and oil, results in the release of large quantities of contaminants into the air. Whether they are emitted from industrial chimneys or vehicle tail pipes, these contaminants pollute the air we breathe, contribute to acid rain, change the composition of our atmosphere and lead to global warming. The Convention on Climate Change, promulgated at the "Earth Summit" in Rio de Janeiro in 1992, therefore set a target for developed countries: return greenhouse gas emissions to 1990 levels by the year 2000. To sustain our present living environment, both locally and globally, we must therefore consider the environmental consequences of our energy plans.

TOWARDS A SUSTAINABLE ENERGY EFFICIENCY POLICY

We have to control the impact on the environment of burning fossil fuels if we are not to risk the potentially profound effects of major changes to the climate. Like most modern communities, Hong Kong must therefore consider ways of meeting its energy demands more efficiently and in an environmentally sustainable manner.

8.3 This will involve re-examining the way most of us use energy, the way our energy needs are met, and what energy costs. This will require the government, commerce and industry, and the community to rethink attitudes towards the use of energy. Achieving change will be difficult because it will require us to confront and question one of the most fundamental sources of our prosperity — a reasonably priced, reliable supply of energy.

8.4 Devising ways to make our society use energy efficiently and in a sustainable manner is arguably the most important of the environmental challenges we now face. However, energy efficiency is a comparatively recent environmental issue and few societies have yet devised comprehensive energy efficiency and conservation strategies, even though the need to devise such strategies is important. The following paragraphs describe our efforts to date to improve our energy efficiency, and which

Energy Consumed by Electrical Domestic Appliances

Electrical Domestic Appliance		Power Rating (kiloWatts)	Approx. Electricity Consumption (Units)
Air Conditioner	¼ HP (7,000 Bth/hr)	760	0.76 unit/hr (max)
	1 HP (9,000 Btu/hr)	940	0.94 unit/hr (max)
	1 ½ HP (12,000 Btu/hr)	1,400	1.4 units/hr (max)
	2 HP (17,000 Btu/hr)	2,200	2.2 units/hr (max)
Cooker Hood		130	0.13 units/hr
Dehumidifier	small size	300	0.3 unit/hr
	large size	450	0.45 unit/hr
Fan		60	0.06 unit/hr
Hair Dryer		600	0.1 unit/10 mins
		1,200	0.2 unit/10 mins
Blender		200	0.05 unit/15 mins
Iron		1,000	0.25 unit/15 mins (max)
Kettle		2,000	0.5 unit/15 mins
Lamp	Tungsten	60	0.06 unit/hr
		100	0.1 unit/hr
	Energy Saving	9	0.009 unit/hr
		25	0.025 unit/hr
	Halogen	50	0.05 unit/hr
	Fluorescent 600 mm (2 feet)	20	0.02 unit/hr
	Fluorescent 1,200 mm (4 feet)	40	0.04 unit/hr
Microwave Oven		1,200	0.2 unit/10 mins (max)
Oven		1,200	0.6 unit/30 mins (max)
Refrigerator (170 litres)		100	about 1.3 units/day
Stereo Amplifier		100	0.1 unit/hr (max)
Rice Cooker		500	0.16 unit/20 mins
Television set or Video Cassette Recorder		80	0.08 unit/hr
Toaster		800	0.04 unit/3 mins
Heater	Fan heater	1,000	1 unit/hr (max)
	Oil radiator	2,000	2 units/hr (max)
Drying Machine	2.3 kg drying capacity	1,400	0.7 unit/30 mins
	5 kg drying capacity	2,300	1.2 units/30 mins
Vacuum cleaner		1,000	0.25 unit/15 mins (max)
Washing machine (5 kg capacity)		360	0.27 unit/45 mins(max)
Electric water heater	shower summer	water temperature about 35°C	0.36 unit/shower
	shower winter	water temperature about 40°C	0.8 unit/shower
	bath summer		1.08 units/bath
	bath winter		2.4 units/bath

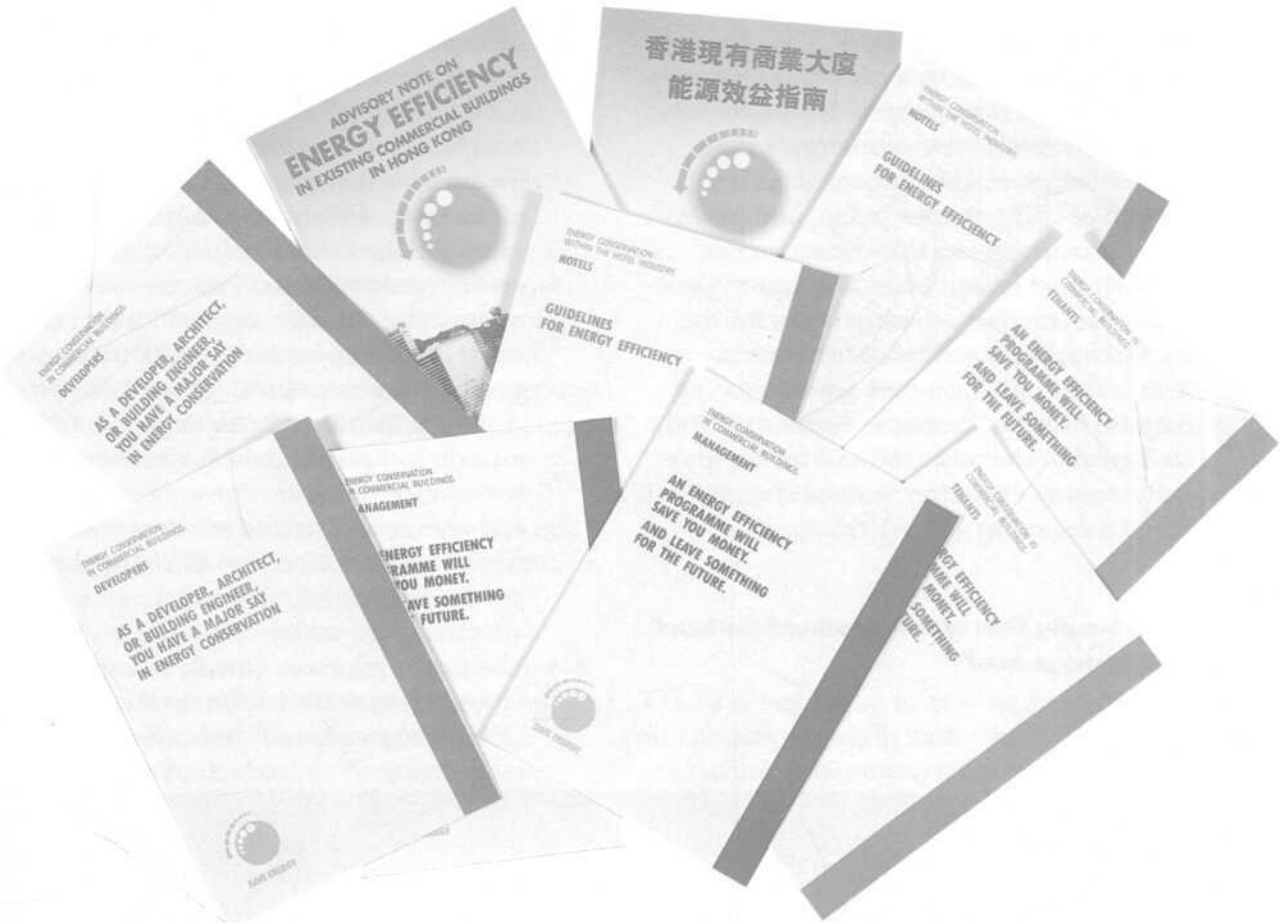
REMARKS

One unit of electricity is consumed when a 1,000 watt appliance is used for one hour.

This table is extracted from *Efficiency Guide to Electrical Products* published by China Light and Power Co. Ltd.

This table is meant to provide information on approximate energy consumption only, *not* the efficiency of the appliance.

8.1 Energy consumption figures



8.2 Energy Efficiency pamphlets

provide the basis for a more comprehensive energy conservation policy.

The Work of the Energy Efficiency Advisory Committee

8.5 Through the Electrical and Mechanical Services Department, the government seeks to practice energy saving measures for installations under its control. However, the problem is not one for government alone, but for the community as a whole. In 1991, the government therefore established an Energy Efficiency Advisory Committee (EEAC) to advise it on proposals to improve energy efficiency in Hong Kong as well as to formulate a comprehensive energy efficiency policy in the long term. The EEAC has established working groups to deal with specific tasks and has recommended several measures, both short and long term.

8.6 It soon became apparent that the EEAC required significantly more data on Hong Kong's energy profile before it could make substantial recommendations on such issues as a comprehensive code of practice for reducing energy consumption. Work has already started on compiling such data and a report on the energy consumption patterns in the commercial sector was published in early 1993. Further research into the patterns of energy consumption in other major energy-using sectors, such as the domestic and transport sectors, will be completed by early 1994. In the meantime, measures which do not hinge on the collection of such data have been recommended and implemented.

8.7 An education campaign on energy effi-

ciency began in March 1993. The object of this campaign is to introduce to the community the environmental problems that arise from the wasteful use of energy and to suggest ways in which energy can be conserved. To help the public and professionals to appreciate the importance of using energy more efficiently, and to demonstrate such use, advisory notes for the commercial sector were distributed in March 1993. Similar notes are now being prepared for the domestic sector and will be available in early 1994. To further promote energy efficiency, a display centre will be established by early 1996.

From Supply Side Management to Demand Side Management

8.8 To minimise the effect of power stations on the environment, Environmental Impact Assessments on power plants are now conducted. In addition, the Schemes of Control Agreements (SCA) with the power companies now contain provisions to encourage them to conform with the environmental standards set by the Director of Environmental Protection, by allowing the same level of return on investment in environmental protection measures as for investment in new generating plants or transmission and distribution facilities.

8.9 Nevertheless, the potential for energy conservation via supply-side controls is limited. Many communities are therefore concentrating on reducing the demand for energy via Demand Side Management (DSM). In line with this trend, the power companies are required under the terms of their SCAs to draw up DSM programmes for consideration by the government in the context of their generation development proposals. To encourage DSM measures, the recurrent expenditure incurred by the companies in promoting energy efficiency and conservation are specifically recognised as a legitimate category of operating expenses to be recovered through tariffs. DSM programmes which have been successfully implemented in other countries include off-peak tariffs and tariff structures to encourage the saving of electricity and to shift the use of electricity from peak to off-peak hours. Such programmes are being examined for implementation in Hong Kong and some have already been implemented. For example, the basic tariff structure of the power companies has been revised to remove the financial disincentive to conserve electricity because tariffs decreased as consumption increased. Other DSM programmes that have been implemented include industrial advisory services, energy surveys for domestic consumers and general energy saving and efficiency advice which are provided free of charge by the power companies.

8.10 The Convention on Climate Change has brought a new dimension to the issue of DSM. Many industrialized countries are considering the introduction of energy or carbon taxes to regulate the use of, and demand for, energy in order to return emissions of carbon dioxide to 1990 levels by the year 2000. Such taxes can be a very efficient and flexible tool, but must be substantial to be effective and Hong Kong should also examine their feasibility (paragraph 11.22).

8.11 The use of energy in our transportation system also needs to be more closely examined. A significant proportion of the movement of goods and people takes place on our roads, with considerable environmental impact and not necessarily in the most energy efficient way. The feasibility of providing more passenger and freight transport based on other modes, such as trains, needs to be explored. In this connection, the Railway Development Study, commissioned by Transport Branch, recommends a plan for further developing the railway infrastructure of Hong Kong up to the year 2001.

Buildings

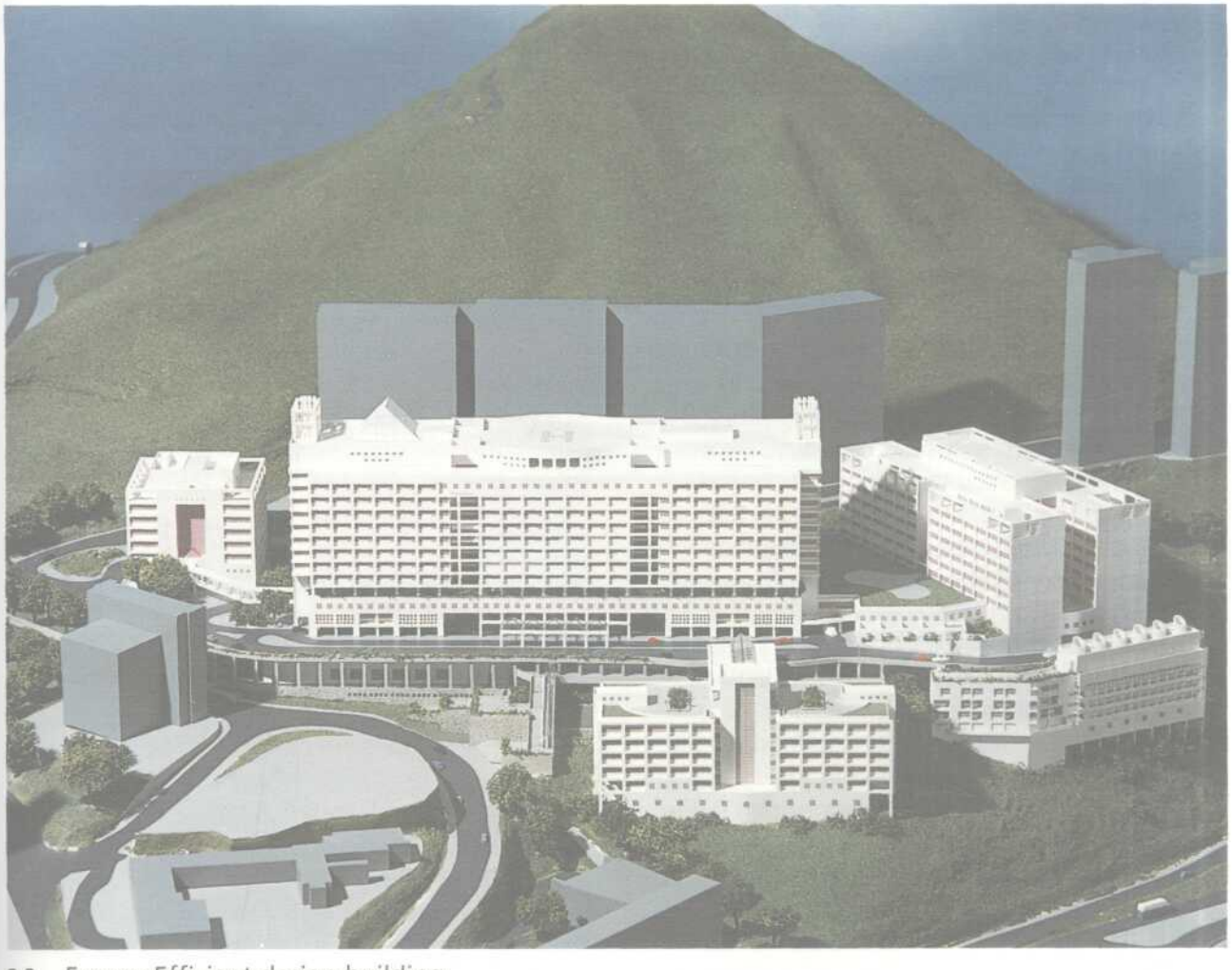
8.12 The success of any DSM programme hinges on the willingness of consumers to take

steps to reduce electricity consumption. A major proportion of the electricity consumed in the Territory is in commercial buildings (about 50%) and in residential buildings (about 23%). Substantial savings can therefore be achieved if the energy efficiency of these buildings can be improved. For example, simple good housekeeping practices such as avoiding unnecessary lighting and air-conditioning will conserve substantial amounts of energy and it is with this aim that the EEAC has initiated a series of advisory notes.

8.13 Government has a sizeable estate — 1,800 owned buildings and 1,190 leased premises. Its annual electricity bill exceeds $500 million. To demonstrate the potential benefits of good housekeeping, government will take the lead in implementing energy efficiency improvement programmes. Energy audits have been conducted in two government buildings — Revenue Tower and Immigration Tower — and improvement programmes based on the findings of these audits will be implemented by November 1993. In addition, we intend to appoint energy managers for all government buildings in 1994. In the meantime, a pilot energy manager scheme has started for Murray Building and the Civil Engineering Building. The Electrical and Mechanical Services Department has also formulated a departmental energy manager programme for buildings occupied by the Department.

Building Design

8.14 It is important to ensure that as far as possible energy efficiency is taken into account



8.3 Energy Efficient design building

when designing a building. Government therefore wishes to encourage research into the application of energy efficient designs and as a first step the EEAC has launched an award scheme for energy efficient building design. The first award will be made in 1994.

Overall Thermal Transfer Values

8.15 Energy conservation has always been one of the considerations in designing government buildings. As early as 1983, the then Architectural Office published a booklet entitled "Energy Conservation in Buildings". In 1989 this booklet was revised and reprinted and issued to architects, engineers and maintenance surveyors. In October 1990, following a government study which concluded that the energy efficiency of buildings could be improved by limiting thermal transmittance through the building fabric, a consultant was commissioned to carry out a feasibility study on the use of Overall Thermal Transfer Values (OTTV) to limit such thermal transmittance. The study was completed in August 1991 and concluded that the adoption of an OTTV for the envelope of a building will improve its overall energy efficiency and that if a building is constructed to a suitable OTTV standard, electricity demand for air conditioning, and environmental pollution from the power stations generating the electricity, could both be reduced. The EEAC subsequently endorsed the concept of introducing maximum OTTV for buildings. It recommended that controls for new commercial and hotel buildings should be introduced early and that these controls should be extended later to other classes of buildings. In September 1992, a draft handbook on OTTV calculations was published for consultation with professional bodies. The consultation period ended in April 1993 and the standards are now being refined in the light of comments received. We intend to propose statutory controls on the OTTV of new commercial buildings and hotels before the end of 1994. At the same time, a handbook giving step-by-step guidance on the methods of calculation to meet the maximum OTTV will be issued.

The Industrial Sector

8.16 Our efforts to improve energy efficiency have so far focused on the commercial and residential sectors. In future, more emphasis will be put on the industrial sector. Although energy consumption in this sector is low compared with the others, the potential for energy savings is still substantial. Government will therefore play a more active role in helping industry improve its energy efficiency. As a first step, data on the energy consumption patterns in the industrial sector are being collected and analyzed, with a view to promulgating a series of advisory notes to assist industry to conserve energy.

Energy Codes

8.17 Apart from OTTV, energy efficiency in

Various fuels	Thermal value	Carbon Dioxide generated
Town Gas	17 MJ/m^3	0.279 kg/m^3
LPG	45,544 MJ/T	3 T/T
Coal	29,300 MJ/T	2.6 T/T
Aviation Fuel	34,128 MJ/T	2.3 T/kl
Petrol/Motor Gasoline	32,531 MJ/T	2.5 T/kl
Kerosene	34,992 MJ/T	2.5 T/kl
Diesel Oil	42,496 MJ/T	3.2 T/T
Fuel Oil	41,500 MJ/T	3.2 T/T

REMARKS
1 MJ (MegaJoule) = 1,000,000 Joules
1 T (tonne) = 1,000 kg
1 kl (kilolitre) = 1,000 litres

8.4 Thermal values of different fuels

buildings can be encouraged in other ways, such as controls on the use of lighting and air conditioning, and by better lift design. The EEAC is now developing codes which address these issues and they will be published for consultation in 1994.

Incentives

8.18 Employees are more likely to take action to reduce energy consumption if there are incentives. Having first set reduction targets, an incentive for reaching them could be to allow individual units in the organisation to retain part of the benefits arising from energy reduction, e.g. savings in the electricity bill, and by adding them, in whole or in part, to staff welfare funds. However, it will be difficult to assess accurately the level of such savings because changes in energy consumption patterns may be attributable to a variety of causes. However, the concept of providing incentives should be further examined.

8.19 The private sector has also been encouraged to introduce energy efficiency programmes. Via the Private Sector Committee on the Environment, a major property developer has been encouraged to compile data on the use of energy in a major development and then introduce an energy savings programme. As 50% of our electricity is consumed by commercial buildings, the capacity for savings in these buildings — many of which are high rise — is substantial. The government will therefore encourage the appointment of energy managers in all major commercial buildings.

Consumers

8.20 Individual consumers can make an important contribution by changing their purchasing habits; that is, by ensuring that electrical appliances (and other appliances such gas water heaters or motor vehicles) are both safe and energy efficient. To make such choices, reliable information on the energy performance of such appliances is required. As a first step, the government proposes a voluntary scheme of energy efficiency labelling for selected electrical appliances. A more comprehensive energy efficiency labelling scheme will also be considered.

*8.21 Via its membership of the Energy Project Group of the Asia-Pacific Economic Cooperation, the government will continue to monitor the progress of research in both energy efficiency from traditional sources of energy and in alternative energy sources which are environmentally sound. In particular, in 1993/94 the Electrical and Mechanical Services Department will strengthen the Energy Efficiency Division, leading to the creation of a full scale Energy Efficiency Office in the following year. This will assist government to examine further measures for energy efficiency and conservation.

8.22 Energy efficiency and conservation is the main environmental issue of our time. Although many of the energy efficient measures that will contribute to such conservation will be technically complex, the overall equation is simple. *We must get more for less.* In particular, global society must obtain more energy from *renewable* resources, that is non-fossil fuels such as nuclear, solar, wind, wave and hydroelectric power. Because of the obvious constraints, and because Hong Kong has no natural energy resources of its own, our capacity to provide any meaningful measure of energy from these sources is limited. But we can contribute to the global goal of energy conservation by ensuring that our use of energy is as efficient as possible. Indeed, because we are importers of energy, we must be as efficient in this respect as we can be.

CHAPTER 9

HONG KONG AND GLOBAL GOALS

THE EARTH SUMMIT AND OUR RESPONSE

9.1 The beauty of the planet first became apparent in its entirety when, in the late 1960s, it was photographed from space by astronauts. Since then, the inter-related texture of the Earth's components, from ocean floor to atmospheric ceiling, has become clear. It is also clear that pollution knows no boundaries and that environmental degradation does not stop at a frontier, a political line not recognised by the natural world. To protect Planet Earth action will therefore be required on a broad international front, a fact recognised by the United Nations Conference on Environment and Development in June 1992 in Rio de Janeiro — the "Earth Summit".

9.1 The earth *(Courtesy of United States Information Service)*

9.2 This important conference drew international recognition to the fact that if Planet Earth is to be protected so that human-kind can sustain life on it, we will all have to change our attitudes to both the environment and to development. This chapter therefore examines the outcome of the "Earth Summit" and sets out how Hong Kong will respond to the obligations arising from the Summit and from other international declarations and conventions aimed at protecting the environment. It should be noted however, that the conventions and agreements are lengthy and complex and full authorised texts of the "Earth Summit" did not become available until earlier this year. They are therefore still being assessed by most countries so that they can articulate a response to the many environmental issues covered by the conventions and agreements, and so that they can assess the resource implications of doing so. However, it should be said at the outset that the

government is determined to adopt the standards set out at the "Earth Summit" and to meet fully the obligations of the international agreements on the environment applied to Hong Kong.

9.3 The two conventions and three non-binding agreements* passed at the "Earth Summit" were:

(a) **The Global Warming Convention**: more properly known as the Convention on Climate Change, and sets out measures to achieve a reduction in the emissions of carbon dioxide and other greenhouse gases.

* A summary of the five documents is at Annex E (1-5).

(b) The **Biodiversity Convention**: a treaty for the conservation of biological diversity and the sustainable use of its components.

(c) The **Rio Declaration**: a non-binding statement of 27 broad principles to guide environmental policy.

(d) The **Statement on Forest Principles**: a non-binding statement on the protection of forests.

(e) **Agenda 21**: a non-binding 300 page document in book form for action to protect the environment while encouraging development.

The government has already moved to fulfil several key objectives of these conventions and agreements.

Global Warming Convention (Annex E1)

9.4 The Convention on Climate Change seeks to stabilise greenhouse gases at a level which will prevent dangerous anthropogenic interference with the climate system. It requires developed countries to draw up greenhouse gas emission inventories, limit emissions and prepare action plans. The control target is to reduce the emission of greenhouse gases such as carbon dioxide and methane to 1990 levels by the year 2000. The work of the Energy Efficiency Advisory Committee (Chapter 8) and the recent decision to move towards the use of natural gas for power generation are evidence that Hong Kong is already contributing to the achievement of the Convention's objectives.

9.5 Recognising the need for inter-departmental cooperation in meeting the standards of the Convention on Climate Change, a Coordination Group on Global Climate Change (CGGCC) was formed in August 1991 under the chairmanship of the Director of Royal Observatory to advise government and to coordinate action on this Convention. One of the CGGCC's early initiatives was to have a greenhouse gas inventory for Hong Kong prepared by the Environmental Protection Department.

The Bio-diversity Convention (Annex E2)

9.6 The Convention on Biological Diversity requires countries to develop strategies to conserve and sustain biological diversity and to introduce procedures for mandatory environmental impact assessment with public participation. In Hong Kong, environmental conservation is pursued through the provision of country parks, the enforcement of legislation to protect important flora and fauna, and through conservation zoning under the Town Planning Ordinance (Chapter 5). Administrative requirements for Environmental Impact Assessment (EIA) were introduced in April 1992 for major public sector projects and legislation to make EIAs a statutory process — with public participation — will be introduced to the Legislative Council in 1994 (Chapter 7). However, to ensure that as much information as possible on Hong Kong's biodata is gathered, the government has agreed to work closely with the Worldwide Fund for Nature (Hong Kong) on the compilation of a full environmental profile for the Territory (Chapter 5).

The Statement on Forest Principles (Annex E3)

9.7 The Statement on Forest Principles deals specifically with the sustainable development of forests. It establishes a code of conduct to be followed in using this natural resource in a way which will not jeopardise the diversity of plants, animals and insects and which will conserve them. While such forests are not found within the Territory, Hong Kong still has a role to play in fulfilling the objectives of the Statement by curtailing its use of tropical hardwoods, of which it is a major importer and user. The government has therefore taken action to reduce the consumption of hardwoods by banning in government contracts the use of hardwood for site hoardings, false work and the shoring of trenches and pits. The Architectural Services Department and the Housing Authority are also testing alternative materials and the Buildings Department has issued practice notes to Authorised Persons and Registered Structural Engineers encouraging and advising them on how to reduce the use of tropical hardwoods.

Agenda 21 (Annex E4)

9.8 The Agenda is a substantial document dealing with the issue of sustainable development. It has forty chapters in which specific activities to promote sustainable development are proposed. As its name suggests, it is a blueprint for improving the environmental performance of world society leading into the twenty-first century. It is not possible to fully cover the scope of Agenda 21 in this review as the activities suggested cover a range of government areas (economic policy, transport policy, education policy and demographic policy) and social measures (restraining consumption patterns and enhancing the role of various groups in society). The government in general endorses the objectives embodied in the Agenda. We will seek to find ways to integrate the concept of sustainable development into other policy areas which have thus far not been recognised as falling within the environmental remit.

9.9 Carrying forward this concept will be a major challenge for societies generally and governments in particular. It will require a measurement of the resources we currently have in stock — land; forests; fresh water sources; minerals; marine resources; flora and fauna. It will require an assessment of the threats to these resources and the development of programmes to protect and, if necessary, replace them so that they do not decline to levels which are unacceptable. What is unacceptable will also need to be considered. The government is already applying many of the key principles set down in Agenda 21; additional programmes will be considered and the green groups, other NGOs and advisory bodies will be consulted.

Rio Declaration (Annex E5)

9.10 The Rio Declaration on Environment and Development sets out 27 environmental principles for adoption by signatory countries. The more important ones include the Polluter Pays Principle, the adoption of a preventive approach to environmental protection and encouraging public participation in environmental decisions. The government endorses these principles and has begun to put them into practice, e.g. by proposing charges for sewage services and for other wastes (Chapter 6); by ensuring that the findings of EIAs for public sector projects are made available to the public (Chapter 7); and by improving the availability of information so that the public are better informed on environmental issues (Chapter 10). As these principles are fundamental to our environmental action on a broad front they are reproduced in full at Annex E5.

Environmental Programme Committee

9.11 To ensure that the government responds promptly and effectively to the many and various environmental matters arising from the "Earth Summit", the government has established, under the Secretary for Plan-

ning, Environment and Lands, an Environmental Programme Committee. One of the Committee's key objectives is to examine the outcome of the "Earth Summit" and to draft a strategy for integrating environmental concerns into a wide range of policies. Areas of early action include:

(a) extending the Polluter Pays Principle;

(b) promoting understanding of environmental concerns within Government;

(c) integrating environmental awareness and the concept of sustainable development into the school curriculum;

(d) identifying the components of biological diversity in Hong Kong for the purpose of promoting its conservation; and

(e) devising a programme plan to mitigate climate change.

9.12 The Committee will continue to identify other areas for action and will monitor progress in the priority areas listed above. In particular, the Committee will monitor how other administrations and international bodies are responding to the initiatives arising from the "Earth Summit". The United Kingdom Government organised a sustainable development conference in Manchester in September 1993 to assist local governments, non government officials, green groups and other environmental organisations to articulate practical responses to the "Earth Summit". The government was represented at this conference. The government will also continue to participate actively in the relevant GATT discussions. The GATT, in response to the Earth Summit, has embarked on a comprehensive discussion of the relationship between trade and environment through the establishment of a Working Group on Environmental Measures and International Trade.

9.13 Hong Kong cannot itself become a party to the two Conventions though they could be extended to us by the UK before 1997. Our view is that the immediate need is to assess and improve Hong Kong's performance in line with the principles of the Conventions.

9.14 Apart from the "Earth Summit", the government is already involved in a broad range of international agreements aimed at protecting the environment.

Montreal Protocol

9.15 The Montreal Protocol on Substances that Deplete the Ozone Layer seeks to control the consumption, production, import and supply of ozone depleting chemicals. Hong Kong is included in the United Kingdom's ratification of the Protocol and, in June 1989, enacted the Ozone Layer Protection Ordinance to effect necessary controls on these substances. Consumption of these substances has so far been cut by over 50%. As a result of these measures, Hong Kong has been able to fulfil the existing obligations under the Protocol.

9.16 Hong Kong will continue to fulfil its obligations under the Montreal Protocol and will keep pace with the accelerated programme for phasing out ozone depleting substances that has been agreed by the Parties to the Protocol. To this end, amendments to the Ozone Layer Protection Ordinance and new Regulations under the Ordinance were introduced into Legislative Council in February 1993. The Regulations impose a ban on the import of products containing controlled substances from non-party countries to the Montreal Protocol and, through mandatory recovery and recycling, require the conservation of controlled refrigerants used in large scale installations and in motor vehicles. Additional measures to discourage further the use of ozone depleting substances are being examined.

Basel Convention

9.17 The government plans to seek the application of the Convention to Hong Kong, which has been ratified by both China and

EYES	SKIN	IMMUNE SYSTEM	CROPS	MARINE LIFE
Cause damage to the cornea, lens and retina of the eye. It has been estimated that 1% decrease in ozone will be accompanied by 0.6% to 0.8% increase in cataracts	Increase the risk of various forms of skin cancers. It is predicted that a 1% decrease in ozone will cause a 2.6% increase in non-melanoma skin cancer	The immune response may be reduced resulting increases in incidence or severity of infectious diseases	Groowth and photosynthesis of certain plants may be inhibited	Marine phytoplankton may be reduced resulting in the reduction of biomass production

9.2 Effects of depleting ozone layer

the United Kingdom. The Convention places controls on the movement across international borders of consignments of chemical, pathological and other waste classified as hazardous. These provisions will require parties to notify each other of proposed shipments, to ensure that such shipments are properly disposed of and to take back any illegal shipments or shipments which cannot be disposed of properly in the receiving country.

9.18 Similar controls have been planned in Hong Kong to coincide with the opening of the Chemical Waste Treatment Centre (CWTC) on Tsing Yi Island. The Basel Convention will give added strength to the legislative controls under the Waste Disposal Ordinance which were planned to coincide with the opening of the CWTC. The government proposes to adopt the requirements in the Convention's provisions and will introduce the necessary enabling legislation to the Legislative Council in 1994.

The Marpol Convention

9.19 Hong Kong has long been a party to this Convention. It requires the safe and environmentally-acceptable disposal of all forms of waste which accumulate or occur on board ships. There are five annexes, each dealing with a specific class of waste, and four of the annexes have taken effect internationally (Annex IV, on sewage, has not yet entered into force). The Secretary for Economic Services has policy responsibility for this Convention, and the Hong Kong legislation which gives it local effect, under which the Director of Marine is the Authority. The government has already implemented Annexes I and II, and intends to introduce new legislation to implement Annexes III and V in 1994.

9.20 With the commissioning of the CWTC, Hong Kong's designated facility for oil-water waste under Annex I and noxious liquid waste under Annex II of the Convention came into being. These Marpol wastes are collected by vessels operated by the CWTC contractor, and enforcement is carried out by the Director of Marine.

London Convention

9.21 The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (until November 1992 known by the short title of 'London Dumping Convention') was signed in London in 1972. It has been amended several times to incorporate new control requirements and was extended to Hong Kong with the enactment of the Dumping at Sea Act (Overseas Territories) Order 1975 (para. 9.23).

9.22 Hong Kong has a permanent representative to the International Maritime Organisation (IMO) in London, who is also responsible for attending the annual sessions of the London Convention. The latest session, in November 1992, reviewed several developments, including the proposed amendments to the London Convention, and began consideration of Agenda 21, as put forward at the "Earth Summit". Via the government's permanent representative at the IMO, we will monitor developments under the convention to ensure that it promptly and effectively meets its obligations.

Dumping At Sea Act

9.23 Hong Kong's obligations under the London Convention are currently provided for by the Overseas Territories Order (1975) of the United Kingdom's Dumping at Sea Act (1974), which has since been replaced by the Food and Environmental Protection Act (1985). This Order extends the provisions of the said Act to Dependent Territories of the United Kingdom.

9.24 To enable the continued implementation of the London Convention after 30 June 1997, and in order that Hong Kong may continue to meet its international obligations to a convention to which it has long been a party, in 1994 the government will introduce to the Legislative Council an act to localise the Dumping at Sea Act. The new legislation will overcome difficulties associated with the application of an outdated United Kingdom Order to Hong Kong, will clear up imprecise areas in the Order, and will bring the penalties for offences into line with penalties under other items of environmental legislation in Hong Kong.

Asia-Pacific Economic Cooperation (APEC)

9.25 APEC was set up in 1989 with 15 governments in the region participating, including Hong Kong. Its aim is to strengthen multilateral trade, to provide opportunities for increased trade and investment as well as to identify common interests. APEC has established a working group on marine resource conservation as well as a project group on regional energy cooperation, under which several expert groups, each with a specific theme, have been formed. The government will continue to participate in the meetings and the various activities of the energy project and expert groups.

9.26 In October 1992, APEC's Expert Group on Energy Efficiency and Conservation decided that a "Compendium of Energy Efficiency Practices and Conservation Measures" should be compiled to assist member countries to assess which practices and measures can best be applied in their own countries. Work will initially focus on collecting data on the patterns of fuel and energy consumption in the food and beverage industry. The data will be used to identify how best to improve energy efficiency and conservation in these industries Hong Kong is contributing to the compilation of the Compendium.

Memorandum of Understanding (MOU) on Environmental Co-operation between Hong Kong and Canada

9.27 Hong Kong and Canada signed the MOU on 8 September 1992 to enhance cooperation on environmental matters. Hong Kong's Environmental Protection Department and the International Affairs Directorate of Canada's Department of the Environment, will develop a cooperation programme. The programme will include, environmental impact assessment procedures and experience, public awareness and education on environmental issues, waste management policies and infrastructure, the application of clean technology, atmospheric pollution, acid rain and climate change. This is one of a number of steps the government is taking to share its own experience and to learn from the experience of others.

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

9.28 CITES was concluded in 1973 in Washington D.C. and came into effect on 1 July 1975. At present 118 countries have ratified the Convention. The United Kingdom ratified the Convention in 1976 and the Convention was extended to Hong Kong in the same year. CITES' objective is to protect endangered and threatened species from over exploitation by regulating international trade in wild animals and plants listed in the appendices of the Convention. CITES parties are required to establish Management and Scientific Authorities to implement a permit system in accordance with the CITES provisions.

9.29 As Hong Kong is an important trading and manufacturing centre for a variety of controlled or banned commodities (e.g. reptile leather, fur coats, American ginseng and ivory) it has an important role to play in protecting endangered and threatened species. A CITES Management Office is operated in the Agriculture and Fisheries Department.

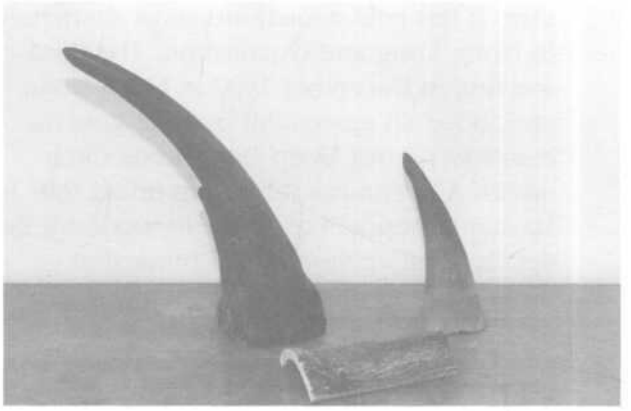
Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)

9.30 The Bonn Convention, concluded in 1979, is aimed at the conservation of migratory animals in recognition of their environmental, ecological and economic value. The United Kingdom ratified the Convention in July 1985 and the Convention was extended to Hong Kong in the same year. It provides for the protection of migratory species in danger of extinction by requiring contracting parties to conserve and restore the habitats of such species, and by preventing any impediments to their migration. The Convention also seeks to persuade contracting parties to conclude "agreements" for the conservation and management of migratory species which have either an unfavourable conservation status and require international agreements for their conservation, or which have a conservation status which would significantly benefit from international cooperation.

9.31 The Mai Po Marshes and the Inner Deep Bay are important habitats for migratory birds including several of the species listed in the Convention. Actively conserving and protecting these is an example of how Hong Kong fulfils its obligations under the Bonn Convention.

Convention on Wetland of International Importance Especially as Waterfowl Habitat (Ramsar Convention)

9.32 The Convention was drawn up in 1971 in recognition of the wetlands as a source of great economic, cultural, scientific and recreational value, and to stem the progressive loss of wetland habitats worldwide. The United Kingdom ratified the Convention in January 1976 and the Convention was extended to Hong Kong in May 1979. The Convention provides for the designation of wetlands of international importance. If a contracting party subsequently deletes or restricts a wetland included in the list, it should as far as possible compensate for the loss of wetland resources and create additional nature reserves for the purpose. Other obligations include the requirement of contracting parties to provide for the wise use of wetlands, for the establishment of nature reserves in wetlands and for their wardening, and for the training of personnel involved within wetlands (paragraph 5.12).



9.3 Seized rhinoceros horn

HONG KONG-CHINA ENVIRONMENTAL COOPERATION:

Hong Kong-Guangdong Environmental Protection Liaison Group

9.33 The Liaison Group was set up in 1990 to improve cooperation between the governments of Hong Kong and Guangdong on environmental issues of mutual concern. The Liaison Group is jointly chaired by the Secretary for Planning, Environment and Lands and the Director of the Environmental Protection Bureau of Guangdong Prov-

ince. It has held annual meetings alternately in Hong Kong and Guangzhou. The third meeting in December 1992 in Hong Kong concluded an agreement by both governments to protect Deep Bay and its catchments. A Technical Sub-group under the Liaison Group will continue to work out the details of an environmental protection programme to meet environmental objectives for Deep Bay and its catchments, which have been agreed by both sides.

9.34 In future, the Liaison Group will need to consider broader environmental issues arising from infrastructure developments in the Pearl River Delta. For example, at an international workshop organised by the British Council in February 1993, the need for an overall wastewater control strategy for the Pearl River delta region was thoroughly discussed and well accepted. Such a strategy would provide the environmental authorities with a common framework for future planning and a means of identifying environmental priorities.

CHAPTER 10

THE ENVIRONMENTAL CHALLENGE — A SHARED RESPONSIBILITY

10.1 Proper management of the environment is a difficult matter for any government. In Hong Kong, with the restraints peculiar to our society (Chapter 2), there are particular challenges. Although government accepts that it must take the lead in responding to these challenges, proper measures to protect the environment and provide for sustainable development can only be successfully implemented if concerted action is taken by the community as a whole.

10.2 Nevertheless government must steer this action. This Chapter will therefore examine the role played by government so far, and set out how other sectors of the community should strive to meet the environmental challenge.

GOVERNMENT AS PRO-ACTIVE LEADER

Capital Investment

10.3 We have already noted (Chapters 5 and 6) the substantial costs to the community of providing environmentally acceptable but cost-effective facilities for overcoming our environmental problems. In most communities the majority of these costs are, initially at least, borne by the government and Hong Kong is no exception. Our spending on the environment in 1991-92 financial year totalled $2.9 billion, a 337% increase over that spent in 1987-88, the year before the 1989 White Paper was published. Spending will need to be sustained for the foreseeable future if all the environmental targets and programmes that have been outlined in this review are to be met (see Chapter 11).

Legislation

10.4 Another area in which the government must take the lead is the preparation, introduction and enforcement of legislation to protect the environment, and to protect the very large sums that have, and will continue to be invested, in environmental protection. Various items of legislation have been referred to throughout this review. To serve as a record for public information a list of such legislation is set out in Annex F. Part II of this Annex lists the legislative programme for environmental items for the next two years. It therefore provides a simple check-list of government's future intentions in this respect.

10.5 The Environmental Protection Department

produces several "guides to environmental legislation" to assist members of the public, and in particular those in commerce and industry who are affected by new legislation, to understand how they may be effected by such legislation. A list of these guides is at Annex G.

Green Housekeeping in Government

10.6 Apart from capital investment and legislation, the government will seek to encourage all sectors of the community to pay more attention to environmental issues. The Governor stated in his 1992 Policy Address that the government should set a good, green example. A number of initiatives have therefore been introduced to make government "greener":

(a) paragraphs on environmental implications are now required in Executive Council and Public Works Sub-committee submissions;

(b) environmental audits in two government departments have begun with a view to extending the practice to all parts of government as soon as possible;

(c) by 1994 government departments will be tasked to appoint a "green manager" to monitor the department's green performance; and

(d) by 1995 each department will be required to include information on its environmental performance in the department's annual report.

Environmental Awareness and Education in the Community

10.7 Many of the measures discussed at the "Earth Summit" require the active involvement of members of the public. For example, part of Agenda 21 calls on countries to reduce waste and recycle more waste, and to use energy more efficiently; and the Rio Declaration requires that the public be given more information about environmental issues that affect them. It is gratifying that in recent years there has been a considerable improvement in Hong Kong in community environmental awareness, much of it achieved through programmes commissioned by the government, the Environmental Campaign Committee and community organisations. There is a need, however, to improve coordination between individual awareness programmes and campaigns to ensure that the best use is made of the available resources. The government has therefore embarked on a broad programme to increase environmental awareness amongst the community.

Environmental Campaign Committee

10.8 One of the first measures was to establish, in 1990, the Environmental Campaign Committee (ECC). The principal objective of the ECC is to promote environmental awareness in Hong Kong and to keep environmental issues in the public eye. It has had several successes. The committee has published a monthly bulletin entitled "ECCO", commissioned an environmental audit manual for small factories, compiled an environmental database, produced teaching kits for use in schools, and organised activity programmes for the annual Environmental Protection Festival and World Environment Day. The ECC has also conducted a survey of public attitudes to the environment that will be used to plan future environmental awareness programmes. To date the ECCs activities have been largely funded by the Royal Hong Kong Jockey Club. In recognition of the importance of the ECC's role in meeting environmental objectives, the government has agreed to consider more permanent funding arrangements.

Environment Publicity

10.9 The ECC's work is complemented by the numerous Announcements of Public Interest

Cities/Countries	Date	Total Qty (tonne/d)	Population (million)	Per Capita (kg/head/d)	Remarks on waste definitiion (see special notes)	Ref
Hong Kong	1992	5,761	5.73	1.00	domestic waste only	a
Singapore	1990	2,824	2.68	1.05	domestic with trade waste	b
Taipei	1989	2,828	2.72	1.04	domestic and non-industrial waste	c
Kaoshung	1989	1,265	1.39	0.91	domestic and non-industrial waste	c
Chicago	1988	3,014	3.32	0.91	residential waste	d
Los Angeles	1988	3,923	3.60	1.09	residential waste	d
Seatle	1988	678	0.58	1.18	residential waste	d
Japan	1989	136,904	123.1	1.11	household and commercial	e
Taiwan	1989	16,717	19.0	0.88	domestic and non-industrial waste	c
United States	1988	492,055	270.6	1.82	residential, commercial and institutional waste	f

Source of reference

a EPD's monitoring data

b Correspondence from Engineering Services Dept., Singapore dated 2 September 1991

c *WEIC0013 — Waste information Exchange* (in Chinese), March 1990, pp 32-34, Information Centre of Waste Exchange, Taiwan

d *Facing America's Trash — What Next for Municipal Solid Waste?*, 1989, pp8, Clean Japan Centre and

e *Recycling something for Everyone* (in English/Japanese), 1992, pp 8, Clean Japan Centre and
Municipal waste management —1989 (in Japanese), 1991, pp 38, Ministry of Health and Welfare, Japan

f *Characterisation of Municipal Solid Waste in United States: 1990 update — Executive Summary*, June 1990, pp ES-11, USEPA

Special notes

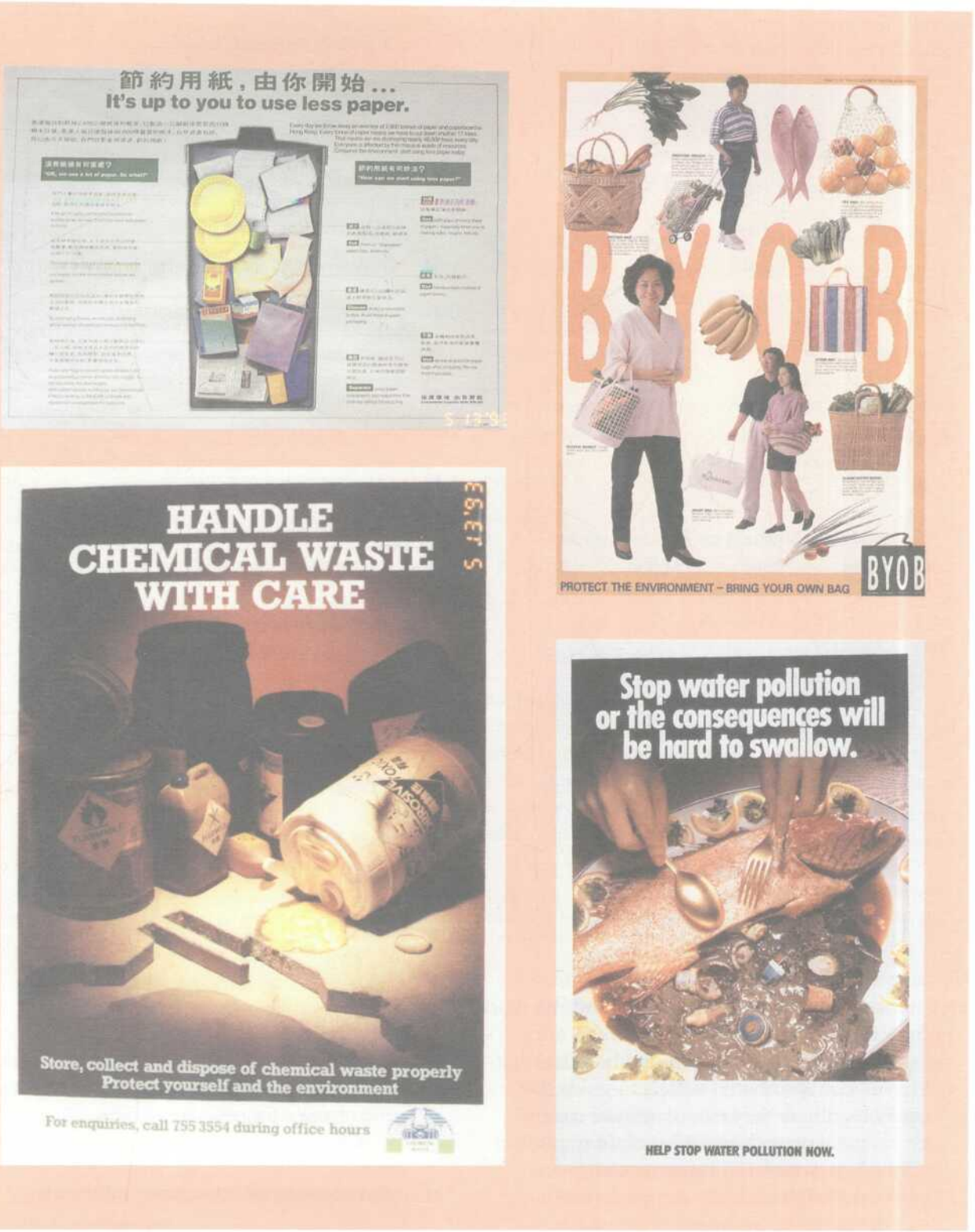
Data collection, record-keeping and waste definition vary widely among the cities and countries. Therefore, the magnitude of real difference is uncertain. Besides, the quantity of waste recycled before disposal is usually not included in the above figures (except USA).

10.1 Waste generation: Hong Kong and the world

(APIs) and posters, leaflets and booklets that have been distributed widely to guide the public on how they can contribute to environmental protection. (A list of these publications is at Annex H). These measures are evidence of the priority the government has given to the environment, which it has classed as a top priority publicity campaign since 1989. Government spending on the campaign has also increased substantially, from $1.45 million in 1989-90 to $1.8 million in 1992-93. The government will maintain this level of spending on general environmental publicity for 1993-94. Campaigns have also been mounted to promote energy efficiency and to explain the arrangements for introducing charges for sewage services.

Environmental Education in Schools

10.10 The future of every community is its children. It is therefore important that children are made aware of environmental issues that affect the community. Consequently, the Education Department issued the "Guidelines on Environmental Education in Schools" in July 1992 to enhance environ-



10.2 Publicity material published by EPD

mental education in the school curriculum. Simultaneously, a module on "Environmental Studies" was incorporated in the newly introduced Advanced Supplementary Level Liberal Studies syllabus at sixth form in September 1992. At the tertiary level, an MSc in the Environmental Management and a BSc in the Environmental Science programme are offered by the University of Hong Kong, a concise environmental

studies module in water management and pollution control by the Hong Kong Polytechnic. At primary level, the ECC has produced a primary school environmental kit for use by primary school teachers. The kit was distributed to all primary schools in November 1992. (A full list of environmental courses is at Annex I). In addition, the green groups in Hong Kong have also devised environmental education materials.

Education on Conservation

10.11 The Agriculture and Fisheries Department, in conjunction with other government departments, provides many opportunities for environmental education in the countryside, and for physical involvement in countryside management work for school children and youth groups. These activities include: forestry work camps; training camps for student conservation leaders; forestry adoption projects; community tree planting schemes; and countryside education walks. These activities help create a better understanding of the countryside, and a sense of respect and improved awareness of the need for its conservation.

Local Control Offices

10.12 The Government recognizes that to promote environmental challenges in the community as a whole, it is necessary to keep the community informed about environmental issues. This objective was one of the reasons why, in 1990, the Environmental Protection Department set up two local control offices as a pilot scheme. This trial demonstrated that such offices can enhance pollution control at the district level, improve communication with District Boards, and keep people in the community better informed about their environment and its problems. The government has therefore decided to increase the establishment of local control offices. In May 1993, the Environmental Protection Department divided the Territory into five regions and set up five local control offices. Through these offices the Environmental Protection Department will further strengthen its action against pollution at district level, and examine the practicability of producing district environmental statements and improvement plans.

10.3 Tree planting by USD

10.4 The EPD marine launch sampling water

Environmental and Conservation Fund

10.13 The government is considering the establishment of a fund to promote a variety of

environmental measures ranging from scientific research to Green Group activities. Preference will be given to proposals which, on the research side, are intended to strengthen our understanding of the environmental impact of pollutants and which, on the activities side, stimulate public understanding and appreciation of the environment.

Environmental Resources Centre

10.14 The measures outlined above should encourage a greater interest in the environment by the younger members of our community and cultivate a thirst for even more information about the environment. The Environmental Protection Department will therefore open an Environmental Resource Centre at the Old Wan Chai Post Office in September 1993. The purpose of the centre will be to act as a "gateway" centre for members of the public and students to find out about the environment and environmental programmes first hand, via the provision of interesting materials and user-friendly computer programmes. The possibility of further centres being opened and operated by non-government agencies will be examined.

Publication of Experience — Environmental Protection Department's record

10.15 The Environmental Protection Department produces a number of guides, leaflets and a comprehensive annual report that inform and educate the community on environmental developments and legislation. Staff of the department also give many lectures and talks to various professional and tertiary institutions and community associations.

Role of Industry Department

10.16 In fulfilment of its role of supporting Hong Kong's manufacturing industry, the Industry Department publishes an annual guide on pollution control legislation affecting manufacturing industries. The guide provides manufacturers with basic information on environmental legislation which may affect them and indicates where technical advice may be obtained. The annual guide is circulated widely to industrial and trade associations and to individual manufacturers who may be particularly affected by environmental legislation. But this is not the limit of the department's assistance to industry on environmental issues.

10.17 In 1992 the Industry Department commissioned a consultancy study entitled "Support to Industry on Environmental Matters". The study, completed in April 1993, assessed the operational, financial and commercial implications of compliance with current and planned environmental controls. The study also examined how existing support mechanisms were helping industry comply with environmental controls and recommended ways on which they could be improved or enhanced.

10.18 According to the study report, environmental legislation and other measures introduced by the government following the 1989 White Paper are already affecting industry. In addition to legislative pressures, factors that are placing demands on the manufacturing industry to comply with environmental requirements include, proposed user charges for chemical waste and sewage disposal, the growing body of *international* environmental regulations, and "green" market pressures.

10.19 The study report concludes that to remain competitive in a fast changing and developing world, manufacturing in Hong Kong needs to upgrade its processes and products. An important part of this challenge is to move towards compliance with environmental controls as such compliance can create "win-win" situations. That is, there can be benefits from changing processes to minimize wastes and save materials; there can be production efficiency gains; there are opportunities to profit from changing consumer preferences; and there is a whole new market in environmental technology in

which firms can compete. The overall aim is to work towards maintaining and enhancing the competitiveness of Hong Kong's manufactured exports in both regional and world markets.

10.20 The support mechanisms recommended by the consultants are aimed at providing manufacturing firms with the information required to comply with environmental legislation and at encouraging firms to introduce appropriate technologies, to occupy suitable buildings and to upgrade processes and products. The recommendations are divided into an immediate action package and a longer term support strategy. The immediate action package focuses on providing information and access to new processes for firms in key potentially polluting industries in Water Control Zones.

10.21 The government recognises that to implement the recommendations in the consultancy study successfully, it is crucial that the findings and recommendations are accepted by industry. The Industry Department is therefore embarking on a comprehensive consultation exercise before submitting the recommendations to the Industry and Technology Development Council for consideration.

Governor's Award to Industry on the Environment

10.22 Apart from technical support, there are other ways of encouraging industrialists to meet their environmental obligations. In March 1992, it was announced that a new category of award — for environmental

10.5 The Governor presenting an environment award

performance — would be added to the Governor's Award for Industry. The idea of extending these Awards to include an environment award was put forward by the Private Sector Committee on the Environment (PSCE), which was also responsible for organising the award. Entries were evaluated against a number of criteria in relation to a company's treatment of non-renewable resources and polluted wastes, recycling and reutilisation of resources, conduct of environmental audit and clean production technology, and environmental benefit to the community. The first award was made on 9 December 1992.

COMMERCE AND INDUSTRY — THE NEED FOR ENVIRONMENTAL RESPONSIBILITY

Environmental Awareness

10.23 The pressures of today's global markets are forcing manufacturing industry to become more competitive. One of these pressures is the need to comply with stricter environmental standards. Government therefore proposes to encourage industry to accept that complying with environmental controls is part of facing up to global competitive pressures. Investment in cleaner technology, in resource conserving equipment and plant, and in streamlined production techniques can help industry become more competitive and productive as well as help it to meet environmental goals.

Environmental Contractors Management Association (ECMA)

10.24 As the demand for environmental services in Hong Kong grows, the number of companies and agencies that are equipped to provide these services also increases. The level of environmental expertise in these companies is generally very high and the government therefore sees merit in regular contacts with the ECMA which has been formed by the environmental service industry. To date such meetings have been irregular. In recognition of their importance, the government will seek to increase the frequency of the meetings and to encourage the ECMA to extend its ambit and membership.

The Construction Industry

10.25 Both consultants and contractors have an important role to play in improving and preserving the Environment. Consultation between the government and such professional bodies as the Hong Kong Institute of Engineers, the Hong Kong Institute of Architects, the Hong Kong Institute of Surveyors, the Hong Kong Construction Association and the Association of Consulting Engineers Hong Kong, ensures that before the introduction of environmental legislation the industry has the opportunity to comment.

Industry's Response to the Environmental Challenge

10.26 The first part of this chapter examined the measures that government proposes to encourage the community generally to become more aware of environmental issues, and to meet its environmental obligations. The remainder of this chapter looks at how industry is trying to respond to the environmental challenge.

Environmental Audits

10.27 As the message gets through to industry that they must improve their environmental performance, the number of companies carrying out environmental audits to measure their performance has increased. To help with this trend, a well known brewery sponsored the production of an environmental audit manual and a shorter environmental audit checklist. This was distributed to many organisations in Hong Kong and the response has been encouraging (paragraphs 7.11 — 7.14).

Private Sector Committee on the Environment (PSCE)

10.28 The PSCE was set up in 1988 to help create a climate of public opinion which will assist government, and where appropriate the private sector, in taking action on environmental issues; to sponsor environmental projects; and to explore a private sector approach to environmental issues.

10.29 Of these objectives, it is in the sponsorship of environmental projects that the Committee feels it can play its most useful role. Through the Centre of Environmental Technology (CET), the Committee has therefore funded exploratory research and feasibility studies into such environmental issues as paper recycling, glass recycling, copper etchant recycling and industry waste exchange schemes. It has also sponsored projects to improve the collection of floating refuse in Hong Kong harbour. Its biggest project to date is the establishment and funding of the CET itself.

The Centre for Environmental Technology (CET)

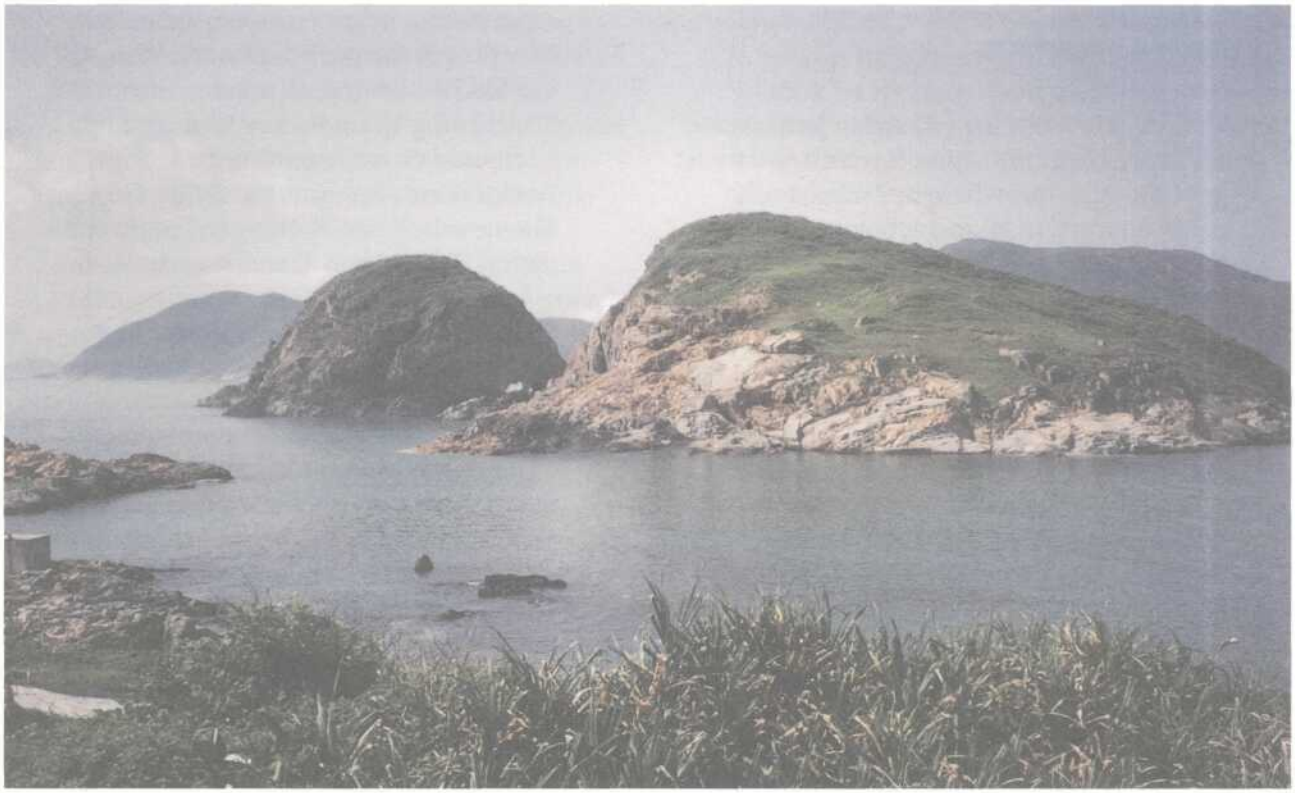
10.30 The CET is a not-for-profit organisation established in 1991 by the Hong Kong Bank Foundation to assist industry to meet its obligations under environmental legislation. The CET's facilities include a demonstration room for pollution control equipment. The CET organises referral services to put industries in touch with experts in the fields of pollution, technology and training, and is currently engaged in developing an environmental data-base. It also carries out environmental audits and, in co-operation with educational institutions, green groups, industry and government, offers services in environmental impact assessments, treatment processes and other environmental projects. The CET at present occupies temporary premises at the City Polytechnic of Hong Kong but the government has assisted by providing a suitable site for a permanent facility with more floor space so that the Centre will be able to provide its services to a larger customer base. Construction of the purpose built centre will be funded by a generous donation from the Royal Hong Kong Jockey Club and by additional donations from the Hong Kong Bank Foundation and The Swire Group. The new building is expected to be completed in Kowloon Tong by early 1995.

10.31 So far as shaping public opinion is concerned, the PSCE does not aim to be a general public consciousness-raising body; nor does it see itself as a campaigning organisation. But both the Committee and the CET have an important role to play in assisting industry to adapt to changed circumstances in which environmental considerations are increasingly prevalent, and to keeping environmental issues high on the agenda of senior businessmen.

Swire Marine Laboratory

10.32 A further example of privately funded environmental activity — in this case research — is the Swire Marine Laboratory, a facility which belongs to the Faculty of Science at the University of Hong Kong. It was officially opened on 3 November 1990. Located on the tip of the Cape d'Aguilar peninsular, the Laboratory aims to provide a modern research facility for the study of Hong Kong's marine life; to initiate research in areas of coastal ecology, pollution and mariculture; and to stimulate an interest in Hong Kong's marine life, both locally and internationally, and thereby promote co-operation among researchers from different countries. To achieve these aims, the Laboratory has been equipped with a wide range of field oriented facilities and has residential accommodation for overseas visitors.

10.33 Since its establishment, resident staff and students of the Laboratory have carried out research into the mangrove ecology at the Mai Po Marshes Nature Reserve and into the growth of corals in the adjoining Lobster Bay and rock pools, conducted a series of studies on the benthos of Tai Tam Bay, and pioneered a study of the zooplankton of



10.6 Cape D'Aguilar

Hong Kong's southern waters. Plans are now underway to build an experimental artificial reef near the laboratory to assess its potential for replenishing depleted fish stocks and revitalising coral reefs.

Business Charter for Sustainable Development

10.34 The International Chamber of Commerce established the above Charter to help business around the world improve its environmental performance. In particular, the Charter is aimed at assisting businesses to contribute to environmental stewardship in a comprehensive fashion. Sixteen principles are included in the Charter and the government encourages as many enterprises as possible to manage their affairs in accordance with these principles. The principles are listed at Annex J.

Hong Kong Productivity Council

10.35 The Hong Kong Productivity Council's Environmental Management Division aims to provide a wide range of consultancy services. These include air, noise and water pollution control; waste management and disposal; waste recycling and resource recovery; energy management and environmental surveys and auditing. Seminars and workshops are also run by the Council to promote environmental education for industrialists. They also aim to encourage industrialists to appreciate that environmental protection and greater productivity are not mutually exclusive, but can complement each other. In addition, through its regular publication *"Green Productivity"*, the Council provides information on pollution control and introduces new "clean and green" ideas and solutions to Hong Kong industry.

The Major Trade Organisations

10.36 The Federation of Hong Kong Industries, the Hong Kong General Chamber of Commerce, and the Chinese Manufacturers Association of Hong Kong have long existed to protect the commercial interests of their members. In

recognition of the growing influence that environmental issues have on their interests — and after some encouragement by the government — these major trade and industrial organisations have recently established environmental committees. The principal focus of these committees has been to represent members' interests to government on environmental policy formulation and policy making, as well as to inform members of changes in regulations both in Hong Kong and in export markets which will potentially impact on their businesses. In recognition of this move, the government intends to improve its contacts with the trade organisations so that discussions with them about environmental issues can be put on a regular footing. The government also welcomes recent moves by the Hong Kong Tourist Association and the Pacific-Asia Tourist Association to become more closely involved in environmental issues. In February this year, the government set out environmental measures for these associations to consider.

Prince of Wales Business Leaders Forum

10.37 On 6 and 7 November 1992, the fourteenth meeting of the Prince of Wales Business Leaders Forum took place in Hong Kong to discuss the environmental challenges facing East and south East Asia. The Forum was well received by regional and international business, community, institutional and environmental leaders. The government participated in the Forum and its "follow-up meeting", held in Hong Kong in March 1993. The government will continue to support such endeavours.

The Media

10.38 The media are clearly an important channel for increasing the community's awareness of environmental issues. However, with a few exceptions, environmental issues are rarely covered in the press with any consistency. When the Press Association circulated to government a list of journalists and their areas of particular interest, not one journalist or columnist listed the environment as an area of interest. The government therefore wishes to encourage the media to put its coverage of environmental issues on a better informed basis by encouraging journalists to devote more attention to environmental issues.

Environmental Pollution Advisory Committee (EPCOM)

10.39 The Environmental Pollution Advisory Committee's current terms of reference are:

- to keep under constant review the state of pollution in the outdoor environment; and
- to advise the government, through the Secretary for Planning, Environment and Lands, on appropriate measures which might be taken to combat pollution of all kinds.

10.40 The prime function of EPCOM is to provide authoritative advice on pollution matters and in this way to contribute to the development of policy. In recognition of this role, the Committee is chaired by an unofficial and all its members (except the Secretary) are unofficials.

10.41 The importance of the place occupied by EPCOM is illustrated by the fact that the Committee is by law required to be consulted on a variety of pollution control ordinances. These provisions were deliberately inserted into these ordinances to ensure that EPCOM's function as a consultative forum was recognised and given a legal basis. Thus all legislative proposals are brought to EPCOM prior to their submission to the Governor-in-Council. Similarly, other important pollution control proposals are discussed in EPCOM in order to obtain the Committee's advice prior to their adoption as government policy. Information Papers are also made available to keep Members informed on subjects where advice as such is not being sought.

10.42 EPCOM is serviced by the Planning, Envi-

10.7 EPCOM at work

ronment and Lands Branch which normally takes the initiative, in consultation with the Chairman, in presenting items for discussion. Members are, however, free to raise issues on any matter falling within the Committee's terms of reference.

10.43 As these terms of reference were devised for the Committee when it was re-established in 1984, EPCOM has asked whether its role and remit is consistent with the Committee's current scope of work. Members have pointed to the growing interest in indoor air pollution issues and conservation as examples of a degree of departure from its original brief. The environmental groups have also expressed the view that they should be formally represented on EPCOM, rather than being invited to nominate representatives *ad personam*.

10.44 The government agrees that it would be appropriate review EPCOM's terms of reference and considers that these might be amended:

(a) to remove any restriction on the Committee's deliberations of indoor air pollution;

(b) to enable the Committee to take a view on matters related to conservation and energy efficiency (subject to the role of other advisory committees on these issues);

(c) to expand and formalise representation of the environment groups; and

(d) to enable the Committee to coopt assistance on technical issues.

10.45 Possible amendments along these lines will discussed and, if agreed, can be introduced for the next term of the Committee, which begins on 1 January 1994. The name of the Committee might also be changed to reflect revised terms of reference and by removing the word *pollution* from its title — thus enabling it to consider a wider range of environmental issues — and renaming it the Advisory Council on the Environment (ACE).

Legislative Council Environmental Affairs Panel

10.46 The Panel convenes at least monthly and scrutinies government environmental

proposals, considers reports on current environmental issues and, on occasion, requires government departments to justify actions taken on environmental issues. The Panel also examines environmental issues referred to it by the Office of Members of the Legislative Council (OMLEGCO) Complaints System, and makes site visits to examine environmental problems and developments firsthand.

District Boards

10.47 Under the District Board Ordinance (Cap. 366), one of the statutory functions of the District Boards is to advise the government on matters affecting the well-being of the people in their districts. Boards are also empowered to initiate and undertake minor environmental improvement projects within their districts where funds are available for the purpose. Examples of these projects include desilting of streams, installing storm drains, planters and flower beds, and planting trees.

10.48 The District Boards examine and comment on Territory-wide government environmental strategies and policies such as those to control livestock waste and water pollution. Indeed their views are sought on all issues which could significantly effect their residents.

10.49 Of the nineteen District Boards, eleven have sub-committees set up to deal exclusively with environmental or related matters. These sub-committees identify environmental problems within their districts and gather resources to resolve them. As well as identifying environmental problems and solutions, they form working groups for specific projects and advise on improvement measures for environmental hygiene and for the general living environment. They also consider, approve and prioritize proposed minor environmental improvement projects and promote environmental awareness activities in their districts.

10.50 Because of their close links with their communities, District Boards and their environmental sub-committees play a significant role in the promotion and awareness of environmental issues. Their close interface with government departments and the Municipal Councils also allows the District Boards to take an active and positive role in supporting environmental initiatives.

Environmental Groups

10.51 Hong Kong has local branches of many of the well known environmental and conservation groups (the World Wide Fund for Nature (Hong Kong), Friends of the Earth, the Conservancy Association, Green Power) and some green groups with more parochial concerns. An important part of the work of these organisations is to bring to the attention of the public matters of environmental concern and to heighten public awareness of environmental issues. In many ways, the green groups act as the conscience of the community reminding it that there is more to be done and urging ever more action. This role is important and should not be overlooked. Until the general public takes environmental concerns as seriously as it takes other everyday issues, the green groups will be acting on behalf of us all in bringing problems to the attention of the government and in highlighting deficiencies in public policy and its implementation. In recognition of this role, government meets with the green groups to discuss environmental issues and to take account of their proposals.

ENVIRONMENT AND THE PUBLIC

10.52 It is clear from the environmental activities described in this Chapter that there is already a range of groups involved in environmental protection efforts in Hong Kong and broad measures in hand as the result of their various initiatives. This is encouraging even though the effort is sometimes fragmented because the measures are managed by groups large and small, public and private. Nonetheless, a

broader community effort is required and the general public should be actively involved in some environmental measures.

10.53 The level of environmental awareness among the general public in Hong Kong has been limited until quite recently. The Bimonthly Telephone Opinion Polls conducted by the City New Territories Administration indicate that many in Hong Kong feel that the environment warrants a low priority: the July 1993 poll showed that only 5% of those interviewed mentioned the environment as a concern to them. This comparative lack of awareness has sometimes prevented the government from obtaining the degree of public support necessary for some of the more unpopular, although necessary, components of its environmental strategy. For example, the extension of controls on the highly polluting livestock industry, or charges to recover the costs of essential waste disposal facilities. This situation is the reverse of that in many developed countries where pressure from consumers and taxpayers has often obliged governments and industries to take action on the environment which they may not have otherwise contemplated.

10.54 Nevertheless, in Hong Kong we are now working towards creating the same sort of environmental awareness as is found elsewhere in the world. After all, many of the concerns which motivate others to take up the environmental banner also apply in Hong Kong. It is therefore encouraging to see that membership of many of the green groups has grown in recent years and that more people in Hong Kong are taking an active role in speaking out about the state of the environment.

Environmental Action for All

10.55 Many are concerned to contribute towards environmental protection but are unsure of what to do or how to go about it. The government education measures and the work of the ECC described in this chapter have been partly directed at this concern but more needs to be done. The rest of this chapter will therefore examine in more detail how the public can contribute to environmental protection. In addition, Annex K sets out simple tasks that we can all carry out to help protect the environment, whether as individuals or as members of a group.

Green Consumerism

10.56 Action can be taken by individuals as consumers. By taking along a shopping bag we can avoid having to collect bags from the shops and markets, and thus reduce the number of plastic bags we use. We can also buy environmentally friendly products and products which do not have expensive or unnecessary packaging as well as buying goods made out of recycled material and avoiding those which cannot be recycled. Overseas experience indicates that when consumers are given environmental information about a product or a service, they will exercise their right of choice and in so doing send a strong signal to those providing the product or service. In turn, a more environmentally friendly product or service can influence the market. This not only assists the improvement of the environment, but has also created some new and thriving industries in countries such as the USA, Germany and Japan.

10.57 In addition to these market forces, the government is also conscious of the basic individual right to environmental information, a principle which the government has started to apply in practice by releasing to the public results of major Environmental Impact Assessments (EIA). The government also considers that if a stronger link between the Environmental Protection Department and the Consumer Council could be developed they could take joint action to help the consumer and the environment at the same time.

INDIVIDUALS

10.58 There is a lot more that individuals can do

to protect the environment. One obvious measure is to reuse or to recycle those elements of household waste which have alternative uses. Paper separation is one example — each household throws away annually, on average, a volume of paper which, if recycled, would save one tree in Hong Kong. As there are 1,663,262 households in Hong Kong, many trees could be saved. Other useful components of household waste include cans and glass bottles. (Recycling in the domestic environment is discussed in Chapter 7).

Energy Saving

10.59 Energy saving is another area where everyone can contribute. This not only makes environmental sense, but also reduces fuel bills. Switching off lights as we leave rooms and ensuring that only necessary lights are kept on is one obvious step. Setting temperature controls for air-conditioners and other controls on a wide range of domestic appliances can also conserve energy. We can even extend energy conservation to the way we travel. For those who drive to work, taking the bus, the MTR or KCR or even sharing driving duties with friends and colleagues will save fuel. In a city like Hong Kong, walking to and from work is possible for many and most of us are capable of walking between floors instead of taking the lift. These suggestions are not only environmentally friendly, they are healthy.

INDUSTRY

10.60 The way in which industry responds to the environmental challenge will not only help its environmental image but may ensure its survival and prosperity as environmental concerns become more prominent. Chapter 11 will therefore discuss the internalisation of costs, how the concept of the Polluter Pays Principle can bring this about, and how a recognition of environmental challenges can lead to lower costs, better productivity and environmentally friendly production.

10.61 Many American and Japanese companies sourcing components in Hong Kong already insist that their local suppliers conform with the environmental requirements established in the country of the parent company if that supplier wishes to continue its relationship with the parent firm. Recognising that to stay competitive means "going green", such companies are reassessing their environmental attitudes in order to stay in business.

10.62 There are several steps that individual industrial concerns can take to achieve an environmentally friendly production process. The most important of these steps is to carry out an environmental audit. This will enable each company to identify areas for greening production processes — how much can be done, how fast, with what results and at what cost. Even simple steps can have substantial benefits. For example, careful measuring of chemicals to ensure that only quantities sufficient for a process are consumed will cut down on waste, cut down on waste disposal charges and cut down on volumes of chemicals consumed. All this saves money.

COMMERCE

10.63 Substantial amounts of waste are generated by commercial enterprises. The paper output from many commercial concerns is very high and many of the recycling measures outlined in this Chapter can be applied. However, the commercial sector's biggest scope for improved environmental performance lies in the field of energy efficiency. Huge quantities of energy are consumed in offices and shops every day in Hong Kong, and much of this is wasted. This energy goes towards lifts, lights and, above all, air conditioning. Turning off unnecessary lights, especially on leaving the room, can conserve a lot of energy as can adjusting the thermostat on the air-conditioner: a 1^0 reduction would not give rise to any discomfort and yet could save thousands of dollars in fuel bills and reduce the amount of carbon fuels consumed in

power stations for electricity generating purposes. Even floor going use of the lift and taking the stairs to ascend or descend one storey can reduce the energy consumption of an office.

SCHOOLS

10.64 Environmental education permeates the formal curriculum at kindergarten, primary and secondary levels. A wide range of subjects are offered to cover the aesthetic, moral, social, technological, scientific and linguistic areas of experience so that knowledge, skills and attitudes conducive to environmental education can be promoted.

10.65 At the kindergarten level, environmental education aims to develop the care for personal hygiene and environmental cleanliness as well as a positive attitude towards maintaining the quality of the natural environment. By participation in environmental activities and in observation of the natural environment primary school pupils begin to see relationships between causes and effects. Through subjects such as Social Studies and Health Education and Science, they are encouraged to explore and explain various environmental phenomena and become more inquisitive about environmental matters. Secondary school pupils are capable of understanding more subtle concepts and begin to look at things from various angles. Environmental education is therefore extended to cover contemporary issues, both locally and globally, in Geography, Biology, Physics, Chemistry, Integrated Science, Social Studies, History, Economic and Public Affairs, Art and Design and Home Economics.

10.66 Schools organise school-based activities such as environmental weeks, talks at school assemblies, study projects, waste paper or glass bottle collection campaigns, field trips and various competitions for pupils to learn about the environment and how to look after it. They also participate in forestry camps, conservation leader training camps, visits, campaigns and projects initiated by government departments and non-government organisations.

10.67 Through measures such as those described in this Chapter, everyone in Hong Kong can take positive steps to help our community shed its image of a first world economy with a third world environment.

CHAPTER 11

COSTING THE ENVIRONMENT

Disbursement of Funds so Far

11.1 As we have seen, the 1989 White Paper set out a detailed action plan for dealing with the most pressing environmental problems of the day and for implementing longer-term strategies for waste disposal. The action plan was matched with a commitment to provide the funds necessary to successfully implement it. Annex A shows how far we have come, paragraph 11.2 summarises the expenditure so far, (and those items marked with an asterisk show projects or proposals which are being funded in the 1993 resource allocation exercise) and paragraph 11.3 refers tofuture expenditure. In respect to future expenditure, some of the proposals require us to consider policies that reflect particularly the need for sustainable development. It must be emphasised that, while government is committed to undertaking further initiatives in the environmental protection area as soon as possible, these initiatives will have to be subject to the availability of resources.

11.2 Since the publication of the 1989 White Paper, some $2.77 billion has been spent on liquid waste capital works projects and a further $938 million on solid waste projects. Recurrent expenditure has grown from $93 million in 1988-89 to $832 million. The environmental programme area now accounts for a greater share of government's total expenditure — 2.6%, up from 0.8% in 1988-89, the year before the 1989 White Paper was published.

Future Costs

11.3 This trend is set to continue for the foreseeable future. Though it is not possible to predict precisely what will happen to recurrent expenditure, an analysis of the capital works programme for the five years leading up to 1996-97 shows continued expenditure on the environment. Over $12 billion is earmarked for liquid waste projects over that period and just over $8 billion for solid waste projects. These figures clearly show the extent of government's commitment to improving the quality of life in Hong Kong.

11.4 Yet expenditure alone is insufficient to protect the environment long-term. As long as use of the expensive facilities being provided is free the necessary attitude shift among users towards greater consideration for the environment will be hard to achieve. The community therefore needs to have a

greater awareness of the cost of protecting the environment by contributing to the cost of protecting it. Only then will many be motivated to doing their share to protect the environment.

Internalising Environmental Costs

11.5 When a company determines the price it should charge for its products, one of the considerations it must naturally take into account is the cost of producing that product. While it is true that, under certain circumstances, it may be beneficial in the short term for a company to price its product below the cost of production in order to gain market entry or to pressure competitors, to do so in the long term will mean expenditure always exceeds income. This leads to one of either two consequences, outside subsidy or bankruptcy.

11.6 Among the costs usually taken into account in determining pricing policy are labour, raw materials, administration, land purchase, plant and machinery, utilities and so forth. In Hong Kong, all too often, one cost attributable to the production process is either ignored or forgotten — waste disposal. This is also a genuine cost. Production creates waste and waste costs money to dispose of. Internalising environmental costs means that the cost of disposing of the waste by-product of production should be taken into account when a company determines both its price and its level of production.

11.7 Internalising environmental costs is rarely done unless there is some pressure to do so. One way it is achieved is by making the polluter pay for the disposal service provided. In order to ensure that the polluter does pay, the provision of a service usually has to be backed up with some compulsion to use it. One way this is achieved is by legislating to provide penalties for avoidance. Thus, if environmental costs are not being internalised by industries, then either the charging system is not working properly, or enforcement is inadequate.

The Polluter Pays Principle

11.8 Chapter 4 listed this principle as one of the ten foundation stones for building a cleaner, greener Hong Kong. It is now examined in more detail.

11.9 The cost of cleaning up Hong Kong's environment and putting it on a sound basis for the future is substantial. Thus far, local facilities which have been established to clean up the environment have been provided as part of the general infrastructure put in place by government. Their use has not, hitherto, been the subject of any direct charge. As a result, services such as municipal waste disposal and sewage services have not been made to pay for themselves. The result of this has been that those who use these facilities on a less than average basis have been subsidising those who use them above the average. In effect, the individual taxpayer, whose use of these facilities is comparatively small, has been paying a subsidy to the larger users. If the principle of internalisation, outlined above, is to be applied, this imbalance should end.

11.10 When costs, such as these, are not borne by those who incur them, they do not simply go away. Someone else inevitably has to pay. Until recently it has been the taxpayer who has had to meet these costs through revenues collected by the government and used to provide these facilities without direct charge. The community does pay collectively however, but indirectly and in other ways: through a degraded amenity value at the beach due to poor water quality; through illness caused by eating shellfish contaminated with bacteria absorbed from animal waste disposed in streams; through health problems associated with breathing air polluted by exhaust fumes from thousands of vehicles on the roads; through interference with sleep and voice communication by noise from transport and machinery. The time has come for the responsibility for payment to pass from the public or the taxpayer to the polluter.

11.11 Those who use environmental services

without paying for them receive a subsidy. The factory owner who pours chemical waste down the drain is subsidised as he does not have to pay the costs required to clean up this pollution. The livestock breeder who allows the waste of his animals to flow into streams and rivers is subsidised by not having to pay for the costs of clearing blocked streams. Neither has to pay the health bills of those affected by polluted food they might eat. These subsidies, though hidden, nonetheless exist. No-one in industry would accept that the taxpayer should pay industry's labour costs or raw materials costs. Why should the taxpayer have to pay for industrial pollution?

11.12 The Polluter Pays Principle is therefore as much a matter of fairness as anything else. However, quite apart from fairness, the Polluter Pays Principle has other benefits directly applicable to the environment. When polluters come to realise that they face a bill for their polluting activities, they will naturally seek ways to minimise the impact of the bills they pay on their overall costs. If labour costs become too high, industry can try to reduce those costs by mechanisation and other efficiency measures. If charges for waste disposal become too high, it should be natural to seek ways to minimise the waste generated to cut down on disposal bills. It is therefore reasonable that charging should become a component of environmental policy to encourage waste minimisation.

11.13 However, the Polluter Pays Principle does not only apply to industry but to everyone. We all generate waste — in the home, at school, at work, in vehicles — but few of us pay directly for the disposal of the wastes we create. The government has therefore embarked on a programme to try to recover, on behalf of the taxpayer, the costs of the necessary facilities and services for disposal of the Territory's waste from those who use them. This means we may all end up paying something, but we will only pay fair and reasonable charges for those facilities and services we use. And we will all have the opportunity to reduce our own bills by waste minimisation, safe in the knowledge that we do not have to subsidise others. Various charging schemes are therefore envisaged and these are summarised below.

Sewage Charges

11.14 This was discussed in paragraphs 6.55 - 6.57.

Solid Waste Charges

11.15 As envisaged in the 1989 White Paper and Waste Disposal Plan, large sums are now being invested in new and more advanced methods of waste disposal and these new facilities are now being provided around the Territory. The government therefore intends to introduce charges to recover the cost of providing these infrastructural projects in accordance with the Polluter Pays Principle.

11.16 In addition to recovering the cost of these facilities, charging for disposal at landfills may also help minimise waste generated as part of our daily lives. We needlessly discard millions of plastic bags a year. Paper, glass bottles and aluminium cans are all thrown into the same rubbish bin, though each of these can be reused or recycled. If we were charged for every kilogramme of waste we discard and which is destined for landfill, we would begin to extract from that waste those materials which can be used again. In this way we would minimise waste to avoid paying for its disposal.

11.17 This is important since space in landfills is limited. Encouraging waste minimisation means prolonging the life of existing landfills and saving on the land needed to build new ones. The longer each one lasts, the more money is saved through not having to construct replacements as early as may otherwise be the case. Waste minimisation saves the individual money and avoids the need to spend more on the construction and operation of waste disposal facilities.

11.18 In Chapter 6 (paragraph 6.89 — 6 92) we noted the problems arising from the excessive amount of construction wastes presented for disposal at landfill. These wastes, together with other commercial and industrial wastes, are the first wastes for which it is proposed to introduce charges. This is in line with the Polluter Pays Principle and will encourage waste minimisation and recycling. The construction industry and related parties have been consulted on this proposal and generally support the principle behind it. We therefore intend to introduce charges in 1994. The extension of the charging scheme to other categories of waste will be kept under review.

Chemical Waste Charges

11.19 The government has considered various options for charging for the treatment and disposal of chemical wastes. A proposal to establish an indirect charging scheme to recover the cost of the Chemical Waste Treatment Centre and the operational cost of the facility by means of a levy on chemical imports was the subject of debate between government and the chemical industry during the latter part of 1991 and most of 1992. The industry was opposed to such a levy on the grounds that it was unfair to those companies that re-exported chemicals, and because the levy did not directly encourage waste minimisation. A consultancy was carried out earlier this year to re-examine the options available, to examine the feasibility of direct charging as a method of cost recovery, and to recommend which of them the government should adopt. The Final Report was presented to government on 16 March 1993. It recommended a series of graduated direct charges on the producers of chemical waste disposed of at the facility. The government has consulted industry on the application of these charges and is now drafting the regulations.

Green Taxes

11.20 Among the more long-term proposals which are being examined in many countries are so-called green taxes. The principle behind these is to use fiscal disincentives to bring about a change in behaviour, and in the way in which people use resources, that will lead to environmental benefits.

11.21 While the concept of such taxes may be clear, the implications of their application is not. In some cases regulation is clearly more environmentally effective than taxation — where a company has a monopoly, for example, it may simply pass the additional cost on to its consumers. Nor will environmental benefits be achieved if taxes or charges are so high that they encourage the waste producer to avoid them by disposing of wastes in an environmentally unacceptable manner.

11.22 One of the green tax proposals that has been mooted elsewhere is the introduction of carbon taxes so as to minimise the use of carbon fuels by encouraging people to examine alternatives, which may have less impact on the environment, such as natural gas. Because of the wide use of energy such a tax (apart from raising significant revenue in a comparatively painless way because even a small tax would realise a substantial sum) may be one of the means by which some environmental objectives can be achieved — reducing greenhouse gases for example. The application of such taxes is now being considered by many developed countries, including the European Community. Because of the wide implications of such a tax their introduction will need to be approached carefully.

CHAPTER 12

SUMMARY OF MAIN POINTS

Chapter 1 — Preface

Addresses by the Governor and the Secretary for Planning, Environment and Lands [and a description of the 3 STEP construction of the review (see Chapter 2 below)].

Governor

- we must pay more attention to the environment;
- the community as a whole must realise the environmental consequences of its activities;
- we have the resources to act;
- we have made a good start with our environmental programmes but there is much more to be done.

Secretary for Planning, Environment and Lands

- this Review gives the people of Hong Kong ample information about their environment so that they can help:
  - to understand it
  - to protect it
  - to sustain it
- 10 principles (or foundation stones) are proposed to guide the community attitude to the environment;
- changes to our life-styles and attitudes to the environment will be necessary;
- the community is encouraged to read the Review and express their views on it.

Chapter 2 — Introduction

2.4 updates the 1989 White Paper on the Environment and the First Review in 1991;

2.5 addresses criticisms that the 1989 White Paper did not go far enough:

2.8 outlines the purposes of the 1993 Second Review;

- to review the progress of the 1989 White Paper;
- to be an environmental educational tool;
- to outline the nature of Hong Kong's environment and to broaden understanding of it;

- to propose a common basis on which to protect Hong Kong's environment;

- to set down initiatives for improving the Government's own environmental performance;

2.9
- to emphasise that environment action is a community responsibility that will require a fundamental change to the way we approach our daily lives;

- to propose that such a change begins with an understanding of the environment;

- to explain that the review is therefore constructed on 3 STEPS:

  STEP I UNDERSTANDING OUR ENVIRONMENT (Chapters 3 & 4)

  STEP II PROTECTING OUR ENVIRONMENT (Chapters 5 & 6)

  STEP III SUSTAINING OUR ENVIRONMENT (Chapters 7 to 11)

[STEP I — UNDERSTANDING OUR ENVIRONMENT — begins at this point]

Chapter 3 — An Overview of Hong Kong's Environment

3.2 emphasises the particular strains on Hong Kong's environment;

- describes the effect of population density and socio-economic activity;

- explains environment stresses arising from this density/activity;

3.4
- introduces the concept of moral responsibility towards the environment;

- proposes that this responsibility has been lacking to date [green group exceptions];

3.6 introduces the concept of *"stewardship"*;

- suggests we adopt an attitude to the environment consistent with attitudes to education and housing;

- emphasises that

  - changing attitudes will not be easy and cannot rely only on technology;

  - we need a common framework;

  - we have to change for our children's sake as well as our own;

3.10 describes Hong Kong's environment as a first step to wider community understanding of environmental issues;

- suggests that "stewardship" begins with understanding our environment;

- describes Hong Kong's topography, flora, fauna, wildlife and climate, country parks, antiquities and monuments;

- emphasises the varied and beautiful nature of Hong Kong's environment;

- concludes that Hong Kong has an environment far more diverse and beautiful than many appreciate and deserves our efforts to protect it.

Chapter 4 — Principles for Protecting Our Environment

4.1 introduces *10 foundation stones* (principles) to guide community action on environmental issues;

[STEP II — PROTECTING OUR ENVIRONMENT — begins at this point]

Chapter 5 — Our Natural Environment: Worth Protecting

5.2 describes the *existing* measures to protect Hong Kong's *natural environment*, including the current arrangements for conservation, namely:

- the broad legislative framework;
- the recent emphasis on countryside education;
- the proposed expansion of country park areas;
- the handing over of additional areas of Mai Po Marshes to the WWF(HK);
- the establishment of a *Marine Parks Authority* in 1994;
- the introduction of a long term *comprehensive landscape plan*;
- describes the RPIS;

describes additional conservation measures, namely:

- 1,000 hectares of green and landscaped open space will be developed in the main urban areas;

5.19 • task forces to clean up the New Territories will be established

5.25 & 5.26 • a *landscaped conservation strategy* and an *urban forestry plan* will be formulated under the Territorial Development Strategy Review;

5.31 • a *comprehensive inventory of historical buildings* and structure will be compiled;

5.27 • disused urban landfills will be restored;

5.27 • disused quarries will be rehabilitated;

5.33 • an Environmental Baseline for the Territory will be published as part of the Territory Development Strategy Review;

5.34 • the government will assist the WWF(HK) to compile a *comprehensive environmental profile* of Hong Kong;

5.35 the many institutions involved in conservation are listed;

- options for further coordinating these institutions are examined;
- the need for a *Conservation Authority* will be examined;
- the choices are:
  - extend the powers of the Country Parks Board
  - extend the powers of EPCOM
  - establish a new Conservation Authority.

Chapter 6 — Pollution and its Control

AIR

6.3 outlines government's policy objectives for controlling air pollution;

6.4 describes the extent of air pollution from specific sources;

6.6 describes the existing legal measures to abate air pollution;

proposes new initiatives for abating air pollution;

6.15 • the ***open burning of refuse*** in the urban areas will be banned by 1994;

6.21 • a consultancy study of ***toxic air contaminants*** not already controlled will be completed by March 1995; a comprehensive programme to control these toxic pollutants will be introduced by 1997;

6.20 • the ***Kwai Chung incinerator*** will be closed in 1996;

6.23 • a survey to measure ***radon*** exposures will be completed by end 1993 and mitigation measures will then be compiled and published;

• measures to mitigate ***Sick Building Syndrome*** will be introduced by 1995;

• ***Air Quality Objectives*** for semi enclosed structures (tunnels, carparks and transport interchanges) will be established by 1994, and guidelines and practice notes on ventilation design and systems and their operation will be published by 1996.

6.11 • government planners will work more closely together to promote more environmentally efficient land use development;

6.12 • additional measures to control air pollution from diesel engines will be implemented;

6.13 • government will encourage the introduction of electric vehicles.

WATER

outlines government policy objectives for dealing with water pollution;

emphasises the difficulties of dealing with this long standing problem;

sets out the current programme for dealing with water pollution;

6.56 • the *High Priority Programme* under the sewage strategy will be implemented as an environment priority and completed by mid 1997;

6.53 • discussions with the Chinese authorities on the Environmental Impact Assessment for the oceanic outfall will continue;

6.61 • government will build some 110 kilometre of sewers and 65 sewage treatment and ancillary facilities over the next 5 years;

6.57 • *Victoria Harbour Water Control Zone* will be declared in phases from 1994 to 1997;

6.57 • *charges for sewage services* will be introduced by 1994;

additional measures for controlling polluting discharges will be considered e.g.:

• relative toxicity in effluent discharge standards;

• non-point source discharges, and

• a requirement to carry on-board sewage reception facilities in vessels above a certain size.

NOISE

describes the difficulties of dealing with noise pollution in the Hong Kong environment;

outlines existing noise control measures;

describes new noise control measures;

6.66 • "noisy" aircraft will be banned from Kai Tak;

6.67 • regulations to control noise from motor vehicles will be introduced in 1993;

6.69 • stricter controls on *Powered Mechanical Equipment* and non-Powered Mechanical Equipment in built-up areas will be introduced in 1994;

6.69 • *piling with diesel hammers* in built-up areas will be banned by 1994;

6.69 • *percussive concrete crushers* and excavator-mounted percussive pneumatic breakers will be banned by 1994;

6.76 • schemes to minimise *vehicle noise at night* will be proposed;

6.77 • $445 million will be spent on the *Schools Insulation Programme* over the next 4 years;

6.77 • $101 million will be spent on noise mitigation measures for households affected by Airport Core Projects over the next 2 years;

6.77 • More roads will be treated with noise reducing over-lay;

6.71 • the *KCRC* and *MTRC* will introduce *noise abatement programmes*;

6.72 • professional input on noise aspects will be included in project planning.

WASTE

summarises the government's policy for solid waste management;

describes the government's solid waste management strategy;

assesses the relative merits of incinerators over landfills in the Hong Kong context;

proposes several measures to improve and update the strategy;

6.84 • *old urban-based landfills* will be restored at an estimated cost of $1.34 billion;

6.85 • a study into the *use of incineration* and other techniques to reduce waste at landfills will be commissioned by end 1993;

6.92 • *charges for the disposal of solid wastes* at landfills will be introduced in stages, beginning in early 1994;

6.88 • *charges for the disposal of toxic wastes* at the CWTC will be introduced in mid 1994;

6.94 • planning for a *Centralized Incineration Facility* will continue;

6.94 • a *code of practice* for handling and disposing of *clinical wastes* will be published in 1994;

6.96 • the *scavenging of floating refuse* will be contracted out to the private sector in 1994;

6.97 • a revised programme of *controls on livestock waste* will be introduced in 1994.

[STEP III — SUSTAINING OUR ENVIRONMENT — begins here]

Chapter 7 — Pre-empting the Problems

looks at the difficulties caused by past neglect of the environment;

emphasises the costs of this neglect;

examines the "economics" of recycling;

examines measures to prevent pollution in the future to avoid past problems;

7.7 • legislation to make *Environmental Impact Assessments* statutory will be introduced in 1994;

7.8 • *environmental monitoring* of major infrastructure projects will be conducted;

7.10 • a study into *environmental auditing* in government departments will be completed by 1994;

7.10 • *green managers* will be appointed in government departments by 1994;

7.19 • *recycling and waste minimisation* programmes within government, and in the private sector, will be encouraged and emphasised in environmental publicity campaigns;

7.22 • government will continue to explore with the construction industry ways to divert construction waste from landfills;

7.23 • the government computer based *Waste Management Model* will be improved;

7.36 • the government will promote the use of *clean production technology*;

7.39 • the government will plan *an overall waste minimisation strategy* for Hong Kong.

Chapter 8 — Energy Efficiency

emphasises the difficulties of energy conservation (changing life-styles etc.)

emphasises the need for urgent action;

notes the limited scope for action in Hong Kong because all our energy is imported;

describes the measures in-hand and proposed;

8.6 • the *Energy Efficiency Advisory Committee* will complete further research into patterns of energy consumption by 1994;

8.7 • *advisory notes* on energy efficiency in the *domestic* sector will be published in 1996;

8.16 • *advisory notes* on energy efficiency in the *industrial* sector will be published in 1994.

8.7 • an *Energy Efficiency Display Centre* will be established at the Hong Kong Museum of Science and Technology by 1995;

8.9 • the power companies will be required to explore and pursue *DSM* measures;

8.14 • the first *award for energy efficiency building design* will be made in 1994;

8.13 • *energy managers* will be appointed for *government buildings* in 1994;

8.15 • a hand-book on *Overall Thermal Transfer Value* calculation will be published in 1994;

8.17 • draft *energy codes* will be published by the EEAC in 1994;

8.21 • the Energy Efficiency Section in the Electrical and Mechanical Services Department will be expanded in 1994-95;

8.20 • to assist consumers, government will publish more information on the energy performance of electrical appliances.

Chapter 9 — Hong Kong and Global Goals

introduces the "Earth Summit" and examines Hong Kong's response;

9.2 reaffirms government's support of the international agreements and conventions agreed at the "Earth Summit" in June 1992;

describes government's action on "Earth Summit" programmes to date and planned;

9.5 • a *Greenhouse gas inventory* has been compiled and will be updated;

9.6 • the government will work closely with the WWF(HK) on *a full environmental profile* for Hong Kong;

9.7 • additional measures to *reduce reliance on tropical hardwoods* will be explored;

9.16 • additional measures to reduce the use of *ozone depleting substances* will be examined;

9.17 • the government will seek the extension to Hong Kong of the *Basel Convention* on the international movement of hazardous wastes;

9.24 • *penalties for dumping at sea* will be increased;

9.25 • the government will continue its membership of expert groups on energy conservation under *Asia-Pacific Economic Cooperation*;

9.27 • *cooperation with Canada* will continue under the Memorandum of Understanding;

9.32 • consideration will be given to *designating Mai Po Marshes under the Ramsar Convention*;

9.33 • *cooperation with China* on environmental issues will continue under the Hong Kong-Guangdong Environmental Protection Liaison Group.

Chapter 10 — The Environmental Challenge — A Shared Responsibility

acknowledges that environmental awareness in Hong Kong is low;

proposes that meeting the environmental challenges is a *community responsibility*, but that government must lead;

10.3 affirms that the rate of government spending on the environment will be sustained for the foreseeable future;

lists environmental actions for all:

10.6 • government will introduce various *"green-housekeeping" initiatives* in 1994;

10.8 • funding for the *Environmental Campaign Committee* will be put on a more permanent basis in 1994;

10.12 • the Environmental Protection Department's *Local Control Office Scheme will be extended*;

10.13 • government will establish an *Environment and Conservation Fund*;

10.14 • an *Environmental Resource Centre* will be opened at the old Wanchai Post Office in 1993; and more such centres will be considered;

10.24 • *liaison* with the *Environmental Contractors Management Association* will be improved;

10.35 • *liaison* with the *main trade organisations* on environmental issues will be improved;

10.43 • the *Environmental Pollution Advisory Committee* will be given wider responsibilities and will be renamed the Advisory Council on the Environment in 1994;

10.50 • in recognition of their important role the *government pledges to meet regularly with the green groups* and to discuss environmental issues with them.

Chapter 11 — Costing the Environment

11.1 existing and future costs of environment spending are set out;

11.8 the Polluter Pays Principle is explained;

11.20 the concept of green taxes is examined.

ANNEX

Annex A

The White Paper on Pollution (1989) — Progress against Targets

Progress made against targets in the White Paper (WP) and the First Review, as at 1 September 1993

WP Para	Status	Objective	WP Target	Progress
1.8	✓	Set up PELB, DSD	1.9.89	Both established 1.9.89.
1.8	✓	Set up new Planning Dept	1.1.90	Established 1.1.90.
1.10	✓	Review of WP progress to Cheung Kwan O Stage III Landfill	1991 1993/4	Published 31.5.91. On target, but Stage I landfill reopened due to critical shortage of landfill capacity.
Waste Management				
2.12	✓	Waste Disposal Plan, publish	31.12.89	Published 30.12.89.
2.15	✓	Open Kowloon Bay RTS	1990	Commissioned 14.5.90.
2.16	✓	Close down Jordan Valley Landfill	1990	Closed April 90.
2.16	✓	Close down LCKIP 'B'	1989	Closed 1989.
2.16	✓	Close down LCKIP 'A'	1990	Closed 16.12.90.
2.15	L	Commission WENT Landfill	late 92*	Commissioning late 1993.
2.16	O	Close down Pillar Point Landfill	1995/6*	Capacity has been increased. The remaining capacity after the commissioning of WENT will be used as a back up facility.
2.15	✓	HK Island East RTS	31.12.92	Commissioned Nov. 92.
2.16	✓	Close down Kennedy Town Incinerator	after HKIERTS*	Closed 18.3.93.

✓ Completed
O On target
L Late
* Relates to White Paper Review
Target dates without brackets are quoted in the White Paper/Review; others are PELB's targets

2.15	L	Commission NENT Landfill	Early 1994*	Commissioning early 1995.
2.16	L	Close down Shuen Wan Landfill	1993/4	Must operate until early 1995 when NENT landfill is due to be commissioned.
2.15	L	Commission SENT Landfill	Mid 1994*	Commissioning late 1994.
2.14	✓	Assess privatisation of landfills	(1991)	Approved by ExCo.
2.16	O	Close Tseung Kwan O Stage III Landfill	1993/4	On target, but Stage I landfill reopened due to critical shortage of landfill capacity.
2.15	L	Commission HKIWTS	1996/7*	Delay due to need to review the feasibility of using the cavern site.
2.15	O	Commission Yuen Long/ Tuen Mun RTS	Post 1996	Feasibility study has commenced in October 92. Construction is scheduled to start around mid-95.
2.15	O	Commission Sha Tin RTS	1994/5*	On target.
2.17	✓	Construct CWTC	31.12.92*	Commissioned April 1993.
2.20	✓	Set up MARPOL disposal point	(1993)	Facility commissioned in April 1993.
2.20	L	Draft MARPOL regulations	1992/3	Details of MARPOL charging to be finalised and the necessary legislation procedures to be arranged.
2.21	L	Commission CIF for animal carcasses, clinical and security waste	1993/4	Commission by mid 1996. Delay due to outstanding issues which need to be resolved with relevant parties.
2.23	✓	Start marine disposal scheme for sludges	1991	Scheme underway and environmental effects are being monitored.
2.24	L	Complete study on recommendations for an integrated strategy for the disposal of sludges	1991*	Phase I completed in 7/91. Phase II completed by 6/93.
2.26	✓	Government to examine how PFA could be used more	(1990)	Re-use of all PFA as reclamation fill is being implemented.
2.30	O	Complete livestock waste control scheme (LWCS)	1.6.95	Phased partial implementation continues. Arrangement to accelerate the scheme to cover the entire territory by 1.6.94 proposed.
2.30	✓	Accelerated programme LWCS, review	1990	Reviewed. Accelerated programme and legislative amendments agreed in principle.
2.31	✓	Chemical waste legislation	31.12.91*	Enacted on 18.3.92 and became effective on 1.5.93. Control scheme implemented in two phases — phase I on 18.11.92 and phase II on 3.5.93.

2.32	L	Draft regulations for the import and use of PCB's	(1992/3)	First draft completed.
2.33	L	Amend WDO (Licences, disposal of PFA etc)	1991/2*	DDIs for comprehensive amendment finalised; consultation with industry for introducing control on import and export of waste completed.
2.38	✓	Encourage recovery and recycling of wastes, strategy required	(1990)	Strategy agreed by EPCOM 23.4.90 being implemented. Further review underway.
2.40	✓	Examine construction waste for recovery and resue	31.12.91*	Final report published in Dec 91. Trial recycling scheme completed.
2.41	✓	Assess viability of use of methane gas at landfills	(1991/92)	Gas utilisation study report concludes not commercially viable at old landfills; viability at new strategic landfills being assessed.
2.42	O	Establish programme to restore completed landfills sites	(1996)	The study on restoration of urban landfills was completed in December 92. Study for Shuen Wan Landfill will be completed in May 93, for Tseung Kwan O Landfills in August 93. Study for the remaining 4 landfills in the northwest of NT has been started in Jan 93 and Phase I scheduled for completion in March 94.

Water Pollution

3.20	✓	Complete Sewage Strategy Study (SSS)	31.8.89	Draft Final Report completed July 1989.
3.20	✓	Decide on sewage strategy policy options	(31.12.89)	Decided 27.10.89.
3.20	✓	Start implementing SSDS	(1990)	Started detail design in 1993.
3.21	✓	Complete East Kowloon Sewerage Master Plan Study (SMP)	1989	Completed June 1989.
3.21	✓	Complete HKIS SMP	1989	Completed June 1989.
3.22	✓	Complete Tolo Harbour SMP	Early 90	Completed June 90.
3.22	✓	Complete TW/KC/TYi SMP	Mid-1991	Completed June 92.
3.22	✓	Complete NWK SMP Study	late 1991	Completed December 1991.
3.23	✓	Commence PS SMP	1989/90	Completed February 91.
3.23	✓	Commence YL/Kam Tin SMP	1990	Completed March 92.
3.23	✓	Commence North & South Kowloon	1992	Completed January 93.

3.23	✓	Commence TM SMP	1992	Completed June 93.
3.23	✓	Commence Chai Wan/ Shaukeiwan SMP	1992	Completed June 93.
3.23	✓	Commence Wan Chai East/ North Point SMP	1992	Commenced May 92.
3.23	O	Commence North District SMP	1992	Commenced January 93.
3.23	O	Commence Aberdeen, A.L.C., Pokfulam SMP	1992	Commenced October 92.
3.23	✓	Commence C&W, and Wanchai West SMP	1992	Completed March 93.
3.24	O	Construct sewerage systems arising from SMP's	(1991 onwards)	$2.9 billlion allocated.
3.26	✓	Submit WPCO Amendment Bill to ExCo (1) - removal of exemptions and 30% increase	1990	Passed into law 25.7.1990. Brought into effect 1.12.90.
3.26	L	Introduce WPCO Amendment Bill (2) - connect up sewers, treatment plant provisions	(1992)	Enabling bill introduced into LegCo in Dec 1992. Amendment regulations setting out the detail are still being prepared.
3.25	✓	Declare PS & JB WCZ	1.8.89	Declared 1.8.89.
3.25	✓	Declare DB, Mirs Bay, NW WCZ	1991*	DB and Mirs Bay declared 1.12.90. NW declared 1.4.92.
3.25	✓	Declare WB/EB WCZ	1993*	WB/EB declared June 93.
3.25	L	Declare VH WCZ	1993*	VH to be declared on subzone basis in phases from 1994-97.
3.25	L	Control effluents in all WCZ	1995*	WCZ's to be established first.
3.29	✓	Establish high level committee with Guangdong	(1990)	Established. Meetings held once a year. The Technical Report on Deep Bay and its Catchment was endorsed by the Liaison Group in December 92.
3.30	✓	Establish 'way ahead' for mariculture	(1991)	Following review, way forward agreed. Achievements now being subjected to further review by the working group chaired by ESB.
3.30	L	Implement Tolo Harbour Action Plan	(1994/5)	There are 7 actions, some on time, some late. Two additional major pollution sources (Shuen Wan landfill and Fish Culture Zones) identified and plans being developed to remove these.
3.30	✓	Watercourse management establish way ahead	(1990)	DDS to take over coordination; with livestock and industrial waste reduction being coordinated through PELB/EPD.

3.31	✓	Establish floating refuse action plan	(1989)	Publicised and implemented 23.11.89.
3.31	L	Assess feasibility of privatisation of floating refuse activities	31.12.91 (if feasible)	Assessed, appears feasible. Contracts and tenders being studied, with a view to privatisation.
3.31	✓	Encourage public sector initiatives	(ongoing)	General support being given to recycling initiatives and Private Sector Committee on the Environment.

Air Pollution

4.14	✓	Declare all HK as ACZ	1989/90	Declared 15.12.89. Became law 7.2.90.
4.15	✓	APC amendments to LegCo	1991/92*	Amendment Ordinance enacted 11.2.93.
4.16	✓	Reduce Sulphur in Fuel Oil	1990	Passed into law 7.3.90. Compliance date 1.7.90
4.17	✓	Dark Smoke Regulations to Exco	1990	Passed into law Sept 90.
4.22	✓	Recruit overseas specialist on vehicle emissions	(1989)	Arrived July 1989.
4.21	✓	Introduce unleaded petrol (ULP) and ensure it is widely used	1992	Introduced at all filling stations 1.4.91.
4.21	✓	More stringent standards on new cars	1992	Passed into law 1.5.91. Took effect 1.1.92 for small vehicles.
4.21	✓	Introduce new measures to better control smoky vehicles	1992	Passed into law 23.1.91. Took effect 1.10.91.
4.21	✓	Examine means to reduce reliance on diesel engined vehicles, and if found feasible, implement	1992	Examined and decision deferred on inflation grounds in 1991. Now under review. Alternative strategies to tackle diesel emissions may emerge.
4.23	✓	Complete asbestos consultancy to determine additional protective measures for the public	(1990)	Consultancy completed.
4.23	✓	Introduce legislation to control asbestos	1993*	Included in the APC (Amendment) Ordinance which was enacted February 93. APC (Asbestos) (Administration) Regulations being prepared by AGC. Partial implementation expected September 93.
4.23	✓	Ban blue and brown asbestos, sale and import	1994	Included in the APC (Amendment) Ordinance which was enacted February 93. Ban on blue and brown asbestos scheduled to take effect on 1.1.94.

4.27	✓	To put in place administrative and legislative controls to protect the ozone layer	1989	New Ordinance implemented 1.7.89. Controls also in place.
4.27	O	Review OLPO and introduce further controls on CFCs, halons and other ozone depleting substances to fulfil international obligations	1993/4	Halons to be phased out by 1994. Quota and licensing controls extended to 1,1,1,-trichloroethane and 10 other CFCs on 1.1.93. New legislation introduced to ban import of products containing CFCs and halons from non-party countries and to ban the intentional venting of CFC-based refrigerants from motor vehicle air-conditioners as well as refrigeration plants with more than 50 kg of refrigerant charge. Licensing control will be extended to carbon tetrachloride on 10.8.93. Further controls on ozone depleting substances to be in line with the Montreal Protocol which is being amended regularly.
4.28	✓	Start phasing out incinerators	various	Staged programme in operation. LCK and KTIP already closed.
4.29	L	Reduce construction dust	1992*	Scheduled to further consult relevant trade/ industries in July/August 93.
4.30	✓	Expand fixed monitoring network	1994	11 now in operation. 2 more being added. Unlikely all 13 can operate in 1992 due to staff constraints.
4.31	✓	Monitor acid rain, and long range transport of pollutants	(1989)	Ongoing monitoring by RO and EPD.
4.11a*	✓	Establish information coordination group to respond to Global Climatic Change (RO, PELB and others)	(1991)	Group established under DRO 1991.
4.14a*	O	Take measures to ensure that Hong Kong uses energy more efficiently	(1991/2)	Energy Efficiency Advisory Committee, headed by SPEL, established in 1991.
4.15	O	Licensing controls on specified processes and lifting of exemptions and extension to new processes	1997	The APC (Amendment) Ordinance was enacted February 1993 for lifting the exemptions of exempted premises and extending the licensing control to new processes which will increase the licenses from the current 48 to the future 60 will be carried out in phases. The first phase of the implementation commenced August 1993 and the final phase is scheduled to commence in 1997.

Noise

5.17	✓	Fully implement main provisions of NCO	1989	All 3 phases implemented by 17.11.89.
5.14	✓	Expand schools noise insulation program	1990	Stage I (aircraft noise) for 37 schools completed. Stage II (traffic noise) for 112 schools completed. Stage III (traffic noise) for 240 schools: to be completed by 1996.
5.17	L	Introduce regulations to control noise from certain other construction activities (rubble disposal, formwork)	1990	The enabling provisions introduced to LegCo on 12.5.93.
5.17	✓	Introduce regulations to control handheld percussive breakers and air compressors	(1992)	Regulations being implemented by 1.12.92.
5.17	L	Control of noise from vehicles under NCO	1993	Proposal and preliminary DDIs to be ready by end 1993.
5.18	✓	All new developments assessed for noise	1989	This is now standard practice.
5.19	✓	Extend road noise reducing programme	1991	5.8 km already resurfaced with another 2.1 km planned.
5.19	✓	Providing traffic management as a traffic noise remedial measures outside the road reserve	1991*	The Road Traffic Ordinance was amended in 1992 to enable the direction of traffic on environmental grounds.

Planning against Pollution

6.14	O	Review Town Planning Ordinance to include environmental considerations	1993*	Interim amendments for NT land uses in January 1991. Environmental amendments being developed in TPO Review.
6.15	✓	PADS, decision to relocate airport	(1989)	Decision made public 11 Oct 1989 — Chek Lap Kok.
6.16	L	Complete Metroplan study, aimed at reducing excessive building density, providing apolicy basis urban environment	June 1991*	Selected strategy endorsed individual development statements include environmental strategic improvement plans.
6.17	✓	RPIS. Initiate strategies to improve NT environment	(1990/1)	Review of temporary rural lands uses in progress. Onging inputs to village improvement.
6.18	✓	(countryside conservation)	(1989)	PELB took over policy responsibility on sewerage projects 1.10.89 from MSB and ESB.

6.18	✓	(quarrying policy)	(1989)	Reviewed. The plan calls for rehabilitation of the 4 main quarries commencing mid-1990's. No further quarries to be set up in urban areas above-ground
6.19	✓	Update HKPSG (environmental chapter)	(1990)	Updated 31.8.90.
6.7a*	✓	Establish new procedures for EIAs	1991[1]	EIA procedures for both public and private projects have been revised (PELB technical circular No. 2/92, EPD advice note 2/92). Proposal for EIA legislation is being developed.

Enforcement and Compliance Policies

7.8	✓	Establish target performance measures for inspection and investigation	(1989)	Measures established, 'Environment Hong Kong 1989'.
7.8	✓	Commence regionalising control activities	(1991)	2 local control offices were established in early 1991. They are situated at Ngau Tau Kok and Tsuen Wan.
7.10	✓	To prosecute in accordance with prescribed circumstances	(ongoing)	Being implemented (prosecution figures in White Paper Review).
7.12	✓	Ensure that contractors who committed repeated environmental offences are not permitted further contracts	(ongoing)	Being implemented.
7.13	✓	Encourage tertiary institutions initiatives in research and development work in pollution control technology and waste reduction and recovery fields	(ongoing)	Centre for Environmental Technology opened 17.11.89, to demonstrate non-polluting treatment and recovery systems for industrial waste.
7.14	✓	Review current level and mechanisms of support to industry	(1990)	ITDC advised that a $10m consultancy study be commissioned to assess the types and levels of support that should be provided to industry to assist it to comply with the White Paper proposals. The study is now complete.

Environmental Education

8.18	✓	Expand general publicity work (obtaining more funds and get outside consultants) ECC	(1990)	The environmental protection campaign continues to be one of the Government's major publicity campaign in 1993/94, with an allocation of $1.7m as campaign fund. The objective of the campaign for the year will be to inform the public on waste reduction and to publicise the need for good waste management practices.
8.19	✓	Environmental Education materials for community groups and educational establishments	90	(i) The "Anti-Pollution Pack", an environmental education package consisting of slides, videos, work cards and a teacher's manual was produced and distributed to secondary school and interested community organisations to provide realistic and practical information for students about pollution problems.
	✓			(ii) A Chinese language environmental education kit "Let's All Make It a Greener World" was produced by the Environmental Campaign Committee in November 92 for distribution to all primary schools, interested community organisations and libraries. The kit consists of a teacher's manual, worksheets, posters, cartoons, cassette tapes, song sheets and plays scripts and focusses major environmental problems in Hong Kong. It aims to instill and cultivate concern for the environment among students in their formative years.
8.20	L	Secure site for environmental resource centre; and open	Mid 1992*	The historic Wanchai Post Office was handed over to EPD in August, 92 for conversion into an Environmental Resource Centre (ERC), Commission work is in progress and the ERC is scheduled to open in September/October 1993.
8.21	✓	Decide on environmental studies being introduced as a new subject at senior secondary level	(1989)	Environmental topics have been included in a number of subjects at the Advanced Supplementary Level (including Biology, Chemistry and Liberal Studies) to augment environmental education at senior secondary levels. In addition, environmental studies has been made one of the optional modules for "Liberal Study". To provide a framework for schools to plan and implement cross-curricular environmental education and activity, a book entitled "Guidelines on Environmental Education in Schools" was issued by Education Department in July 1992. To help schools meet the principles stated therein, in-service teacher training programmes are conducted by Education Department on a regular basis.

8.22	O	ED to set up 3 new field centres Cheung Chau, Tung Chung, Route Twisk (Tsuen Wan)	(1993/4)	In addition to the existing field study centre in Sai Kung, the Education Department plans to set up more centres to cope with the increasing demand from schools. A privately sponsored centre on Route Twisk, Tsuen Wan, is to be opened in 1993, and two more centres are planned for Cheung Chau and Tung Tsz in Tai Po.
8.23	✓	Establish short courses on narrowly defined environmental protection and pollution control topics	(ongoing)	Annex D of White Paper Review lists courses.
8.24	✓	Involvement of VA's in environmental education, explore funding	1989/90	Green groups and voluntary agencies play an important role in promoting environmental awareness. Key personnel of green groups and voluntary agencies are invited to sit on ECC and its working groups. To better promote public awareness of environmental issues, ECC has established a funding scheme to sponsor meaningful environment-related projects organised by green groups, voluntary agencies, schools and community organisations. Continual efforts have been made to mobilize voluntary agencies, schools and community organisations to participate in environmental activities at community level. For example, a number of VAs took part in the Waste-Not-Want-Not Carnival in EPF 92 to promote the 4R's concept. ECC sponsored five seminars organised by green groups in 92/93. To provide members of the public with a ready access to environmental information, consideration is being given to setting up more Environmental Resource Centres on a regional basis and contracting out their daily management to the green groups.

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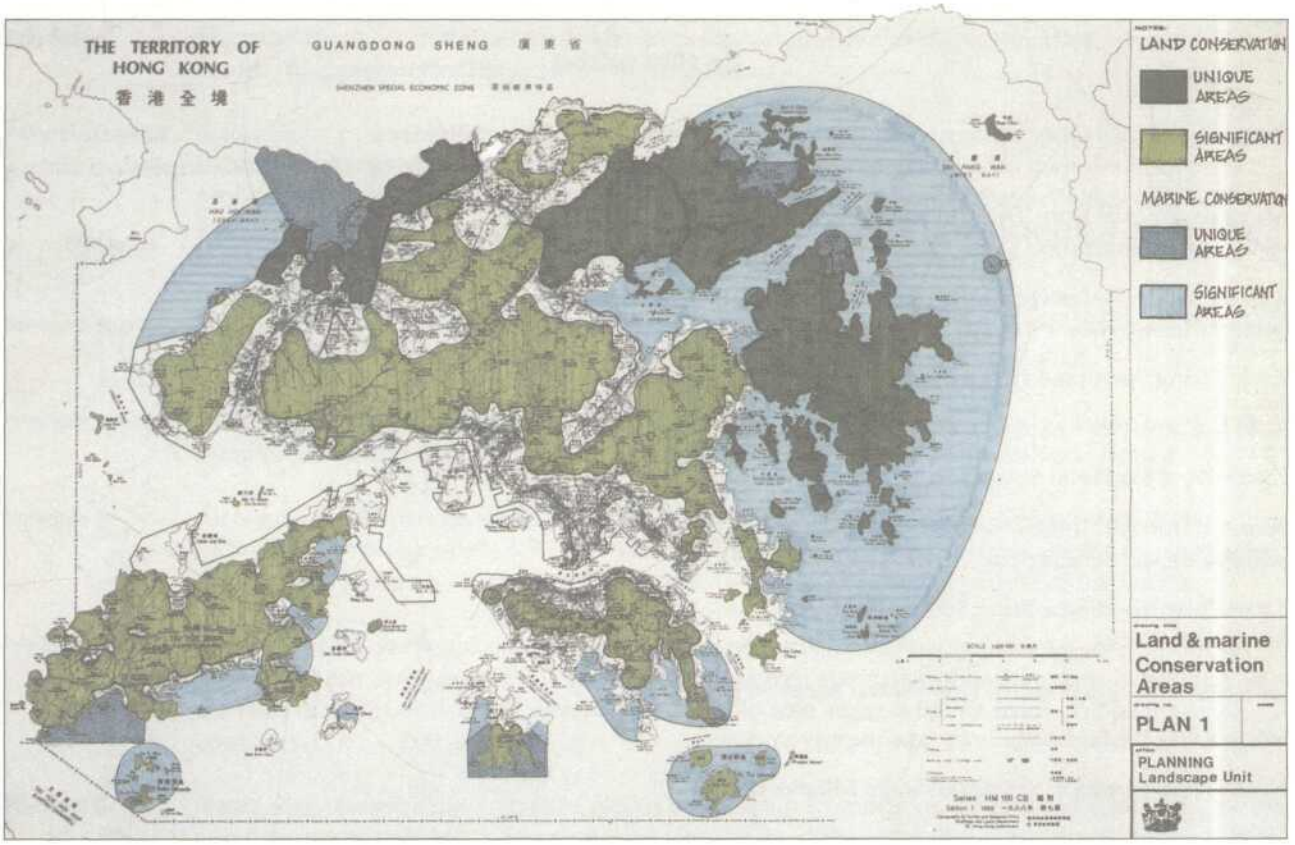
Annex C

Territorial Development Strategy (TDS)



Annex D

Dates & Costs of Major Sewerage Projects

(in 1992 prices)

Project	Project Estimate ($M)	Target Completion Date
Nutrient removal from Tolo Harbour effluent export scheme Stage I	453	9/93
East Kowloon Sewerage Improvement & Pollution Control Stage I Phase I	484	2/94
Kwun Tong Sewerage District Development	130	12/94
Tolo Harbour Sewerage of Unsewered Areas Stage I Phase IA	90	1/95
North West Kowloon Sewerage Stage I Phase I	12	4/95
Nutrient removal from Tolo Harbour effluent export scheme Stage II	430	5/95
Tsuen Wan and Kwai Tsing Sewerage Stage I Phase I Advanced Works	26	7/95
Tolo Harbour Sewerage of Unsewered Areas Stage I Phase IB	85	8/95
Hong Kong Island South Sewerage Improvements	664	8/95
North West Kowloon Sewerage Stage I Phase II	60	11/95
SSDS Stage I Consultancy	130	12/95
Outlying Islands Sewerage	258	1/96
Yuen Long & Kam Tin Stage I	32	2/96
Tai Po Sewage Treatment Works Stages I & II Upgrading	148	6/96
Port Shelter Sewerage Stage I%	82	6/96
Chai Wan & Shau Kei Wan Sewerage	53	12/96
North & South Kowloon Sewerage Stage I	220	3/97
Tsuen Wan/Kwai Tsing Sewerage Stage I Phase I	156	3/97
Ting Kau and Sham Tseng Sewerage	162	97/98
Yuen Long & Kam Tin Stage II	108	1/98
North District Sewerage	206	12/98
Aberdeen/Ap Lei Chau/Pokfulam Sewerage	265	8/99
Wanchai East and North Point Sewerage	323	11/99
Tuen Mun Sewerage	70	6/05

Annex E1

The Rio Declaration on Environment and Development

Principle 1 Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature.

Principle 2 States have, in accordance with the Charter of the United Nations and the principle of international law, the sovereign right to exploit their own resources pursuant to their own environmental and developmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.

Principle 3 The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations.

Principle 4 In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it.

Principle 5 All States and all people shall cooperate in the essential task of eradicating poverty as an indispensable requirement for sustainable development, in order to decrease the disparities in standards of living and better meet the needs of the majority of the people of the world.

Principle 6 The special situation and needs of developing countries, particularly the least developed and those most environmentally vulnerable, shall be given special priority. International actions in the field of environment and development should also address the interests and needs of all countries.

Principle 7 States shall cooperate in a spirit of global partnership to conserve, protect and restore the health and integrity of the Earth's ecosystem. In view of the different contributions to global environmental degradation, States have common but differentiated responsibilities. The developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command.

Principle 8 To achieve sustainable development and a higher quality of life for all people, States should reduce and eliminate unsustainable pattern of production and consumption and promote appropriate demographic policies.

Principle 9 States should cooperate to strengthen endogenous capacity-building for sustainable development by improving scientific understanding through exchanges of scientific and technological knowledge, and by enhancing the development, adaptation, diffusion and transfer of technologies, including new and innovative technologies.

Principle 10 Environmental issues are best handled with the participation of all concerned citizens, at the relevant level. At the national level, each individual shall have appropriate access to information concerning the environment that is held by public authorities, including information on hazardous materials and activities in their communities, and the opportunity to participate in decision-making processes. States shall facilitate and encourage public awareness and participation by making information widely available. Effective access to judicial and administrative proceedings, including redress and remedy, shall be provided.

Principle 11 States shall enact effective environmental legislation. Environmental standards, management objectives and priorities should reflect the environmental and developmental context to which they apply. Standards applied by some countries may be inappropriate and of unwarranted economic and social cost to other countries, in particular developing countries.

Principle 12 States should cooperate to promote a supportive and open international economic system that would lead to economic growth and sustainable development in all countries, to better address the problems of environmental degradation. Trade policy measures for environmental purposes should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade. Unilateral actions to deal with environmental challenges outside the jurisdiction of the importing country should be avoided. Environmental measures addressing transboundary or global environmental problems should, as far as possible, be based on an international consensus.

Principle 13 States shall develop national law regarding liability and compensation for the victims of pollution and other environmental damage. States shall also cooperate in an expeditious and more determined manner to develop further international law regarding liability and compensation for adverse effects of environmental damage caused by activities within their jurisdiction or control to areas beyond their jurisdiction.

Principle 14 States should effectively cooperate to discourage or prevent the relocation and transfer to other States of any activities and substances that cause severe environmental degradation or are found to be harmful to human health.

Principle 15 In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

Principle 16 National authorities should endeavour to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment.

Principle 17 Environmental impact assessment, as a national instrument, shall be undertaken for proposed activities that are likely to have a significant adverse impact on the environment and are subject to a decision of a competent national authority.

Principle 18 States shall immediately notify other States of any natural disasters or other emergencies that are likely to produce sudden harmful effects on the environment of those States. Every effort shall be made by the international community to help States so afflicted.

Principle 19 States shall provide prior and timely notification and relevant information to potentially affected States on activities that may have a significant adverse transboundary environmental effect and shall consult with those States at an early stage and in good faith.

Principle 20 Women have a vital role in environmental management and development. Their full participation is therefore essential to achieve sustainable development.

Principle 21 The creativity, ideals and courage of the youth of the world should be mobilized to forge a global partnership in order to achieve sustainable development and ensure a better future for all

Principle 22 Indigenous people and their communities, and other local communities, have a vital role in environmental management and development because of their knowledge and traditional practices. States should recognize and duly support their identity, culture and interests and enable their effective participation in the achievement of sustainable development.

Principle 23 The environment and natural resources of people under oppression, domination and occupation shall be protected.

Principle 24 Warfare is inherently destructive of sustainable development. States shall therefore respect international law providing protection for the environment in times of armed conflict and cooperate in its further development, as necessary

Principle 25 Peace, development and environmental protection are interdependent and indivisible.

Principle 26 States shall resolve all their environmental disputes peacefully and by appropriate means in accordance with the Charter of the United Nations.

Principle 27 States and people shall cooperate in good faith and in a spirit of partnership in the fulfilment of the principles embodied in this Declaration and in the further development of international law in the field of sustainable development.

Annex E2

United Nations Framework Convention on Climate Change

Objectives

To achieve stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system

Commitment

Under Article 4 of the Framework Convention, all parties, irrespective of their being a developed or a developing country, should, amongst other actions:

(a) develop, update and publish inventories on greenhouse gases and sinks;

(b) formulate and implement measures to mitigate climate change and its possible impact;

(c) cooperate in scientific and socio-economic research, the development of data archives, education and training in relation to climate change; and

(d) inform the Framework Convention's Secretariat of their plans and measures, within three years of the Framework Convention coming into force for "developing country" parties and six months for "developed country" parties.

In addition to the above, developed country parties are required to:

(a) adopt national policies and take corresponding measures to limit greenhouse gas emissions with the aim of returning individually or jointly by the end of the present decade to their 1990 emission levels;

(b) communicate to the Conference of the Parties, within six months of the entry into force of the Convention and periodically thereafter, detailed information on these policies and measures; and

(c) provide new and additional financial resources to meet the "agreed" full costs incurred by developing country parties in complying with the Convention.

Annex E3

Convention on Biological Diversity

Objectives

The conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of benefits arising out of the utilisation of genetic resources.

Content

Each contracting parties shall, in accordance with its particular conditions and capabilities:

(a) identify and monitor their biological and genetic resources and set up protected areas to safeguard them;

(b) develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity;

(c) encourage the transfer of knowledge, skills and technologies between developed and developing countries;

(d) offer help to developing countries to devise plans which safeguard the biological diversity of the planet and meet their national needs;

(e) promote and encourage understanding of the importance of biological diversity; and

(f) introduce appropriate procedures requiring EIA of its proposed projects that are likely to have adverse effects on biological diversity.

Annex E4

Statement of the Forest Principles

The guiding objective of the principles is to contribute to the management, conservation and the sustainable development of all types of forests and to provide for their multiple and complementary functions and uses.

Major principles of the Statement include:

(a) forests resources and lands should be sustainably managed to meet the needs of present and future generations;

(b) trade which supports the sustainable use of forests should be encouraged;

(c) national policies and strategies should provide a framework for increased efforts, including the development and strengthening of institutions and programmes for the management, conservation and sustainable development of forests;

(d all countries should take positive and transparent action towards reforestation, afforestation and forest conservation, as appropriate;

(e) new and additional financial resources should be provided to developing countries to enable them to sustainably manage, conserve and develop their forest resources; and

(f) the inclusion of environmental costs and benefits in decisions related to forest resources should be encouraged.

Annex E5

Agenda 21

The Agenda 21 is a non-legally binding document. All member countries are required to establish a corresponding commission for its national implementation Non-Government Organisations (NGO) of different nations are invited to take an active role in the implementations of the principles of the document. The major principles of the document are:

(a) make trade and environment mutually supportive. Implement environmental measures while preserving free trade;

(b) combat poverty to maintain a sustainable livelihood for the population;

(c) internalise environmental costs into the pricing mechanism;

(d) promote sustainable consumption patterns;

(e) incorporate demographic trends in the analysis of environment and development issues;

(f) protect and promote human health;

(g) protect the atmosphere;

(h) promote environmental education;

(i) implement land-use planning for conservation purposes;

(j) protect marine resources;

(k) protect the quality and supply of fresh water resources;

(l) provide an environmentally sound management of solid wastes;

(m) participation by the business sector, industrial sector, trade unions, women and youth groups in achieving sustainable development should be encouraged; and

(n) strengthen the role of Non-Government Organisations in achieving sustainable development.

Annex F

List of current and planned environmental legislation

Current Legislation

Air Pollution Control Ordinance (Cap. 311)	October 1983
Air Pollution Control (Amendment) Ordinance 1993	February 1993
Air Pollution Control (Smoke) Regulations	October 1983
Air Pollution Control (Furnaces, Ovens & chimneys)	December 1972
(Installation and Alteration) Regulations	
Air Pollution Control (Dust & Grit) Regulations	January 1974
Air Pollution Control (Appeal Board) Regulations	October 1983
Air Pollution Control (Air Control Zone) (Declaration) Order	December 1986
Air Pollution Control (Air Control Zone) (Declaration) Order	1989
Air Control Zones (Consolidated) Statement of Air Quality Objectives	January 1987
Air Pollution Control (Specified Processes) Regulations	October 1987
Air Pollution Control (Specified Processes) (Specification of Required Particulars and Information) Order	October 1987
Air Pollution Control (Fuel Restriction) Regulation	1990
Air Pollution Control (Vehicle Design Standards) (Emission) Regulations	1991
Ozone Layer Protection Ordinance (Cap. 403)	July 1989
Ozone Layer Protection (fees) Regulations	June 1989
Noise Control Ordinance (Cap. 400)	July 1988
Noise Control (General) Regulations	February 1989
Noise Control (Appeal Board) Regulations	Febraury 1989
Technical Memorandum on Noise from Percussive Piling	December 1988
Technical Memorandum on Noise from Construction Work other than Percussive Piling	December 1988
Technical Memorandum for the Assessment of Noise from Places other than Domestic Premises, Public Places on Construction Sites	Decembr 1988
Water Pollution Control Ordinance (Cap. 358)	1 April 1981
Water Pollution Control (General) Regulations	1 April 1987
Water Pollution Control (Appeal Board) Regulations	1 April 1987
Technical Memorandum on Standards for Effluent Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters.	January 1991

Waste Disposal Ordinance (Cap. 354)	1970
• Waste Disposal (Chemical Waste) (General) Regulation	1991
• Waste Disposal (Forms and Fees for Licences) Regulation	1991
• Waste Disposal (Appeal Board) Regulation	1991
• Waste Disposal (Livestock Waste) Regulations	March 1988
Dumping at Sea Act (DASA) 1974 (Oversea Territories) Order	1975
Air Pollution Control (Furnaces, Ovens & chimneys)	
(Installation and Alternation) (Amendment) Regulations	August 1993
Air Pollution Control (Specified Processes) (Amendment) Regulations	August 1993
Ozone Layer Protection (Products Containing Scheduled Substances) (Import Banning) Regulation	May 1993
Ozone Layer Protection (Controlled Refrigerants) Regulation	May 1993

Proposed Legislation

Air Pollution Control (Open Burning) Regulations	April 1994
Air Pollution Control (Construction Dust) Regulations	April 1994
Air Pollution Control (Asbestos Administration) Regulations	December 1993
Air Pollution Control (Vehicle Design Standards) (Emission) (Amendment) Regulations)	June 1994
Amendment of WDO to include Basel Package	Early 1994
Solid Waste and Chemical Waste Charging Regulations	Early 1994
Localised Legislations of DASA	Mid 1994
Amendment to technical momorandum on Noise of Percussive Piling	Mid 1994
Noise Control (Motor Vehicles) Regulation	Early 1995

Annex G

List of "Guides to Environmental Legislation", Codes of Practice and other guidance notes put out by EPD

1. A Concise Guide to the Air Pollution Control Ordinance (Jan 89)
2. A Guide to the Air Pollution Control (Smoke) Regulations (Sept 91)
3. Stop Smoke Emission from Motor Vehicles (leaflet)
4. A Guide to the Air Pollution Control (Furnaces, Ovens & Chimneys) (Installation and Alteration) Regulations (Jan 89)
5. A Guide to the Air Pollution Control (Appeal Board) Regulations 1983 (Jan 89)
6. A Guide to the Air Pollution Control (Specified Process) Regulations (Jan 89)
7. A Guide to the Air Pollution Control (Dust & Grit Emission) Regulations (Jan 89)
8. A Guide to CFCs and Halons (Jan 90)
9. Code of Good Practices for the Operation of Liquid Fuel — Fired Commercial, Industrial and Domestic Appliances (Mar 90)
10. A Concise Guide to the Ozone Layer Protection Ordinance (Jan 91)
11. Dark Smoke Costs (leaflet)
12. A Guide to the Air Pollution Control (Fuel Restriction) Regulations (Aug 90)
13. A Concise Guide to the Noise Control Ordinance (Feb 91)
14. Technical Memorandum on Noise from Percussive Piling (Oct 90)
15. Technical Memorandum on Noise from Construction Work other than Percussive Piling (July 91)
16. Technical Memorandum for the Assessment of Noise from Places other than Domestic Premises, Public Places on Construction Sites (July 91)
17. A Practical Guide for the Reduction of Noise from Construction Works (July 89)
18. A Practical Guide for the Reduction of Industrial Noise (Oct 89)
19. A Guide for the Reduction of Ventilating System Noise
20. Application of Screening Structures to Abate Noise from Surface Transportation
21. Code of Practice on the Handling, Transportation and Disposal of Asbestos Waste (C&E) (Jan 93) (revised version)
22. Code of Practice on the Handling, Transportation and Disposal of Polychlorinated Biphenyl Waste (C&E) (Dec 92) (revised version)
23. Waste Disposal Plan for Hong Kong (C&E) (Dec 89)
24. Livestock Waste Control Scheme (May 90)

25 Code of Practice: Livestock Waste Management (May 88)

26. 'Dry Muck-out' — Pamphlet

27. Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes (C&E) (Oct 92)

28. A Guide to the Chemical Waste Control Scheme (C&E) (Sept 92)

29. A Guide to the Registration of Chemical Waste Producers (C&E) (April 92)

30. Control of Chemical Waste (leaflet) (C&E)

31. Registration of Chemical Waste Producers (leaflet) (C&E)

32. Water Pollution Control Ordinance — Tolo Harbour and Channel Water Control Zone (information booklet) (April 1991)

33. Water Pollution Control Ordinance Southern, Junk Bay and Port Shelter Water Control Zones (information booklet) (Nov 1991)

34. Water Pollution Control Ordinance the Deep Bay and Mirs Bay Water Control Zones information booklet (Feb 1991)

35. Water Pollution Control Ordinance — North Western Control Zone information booklet (April 1992)

36. Technical Memorandum on Standards for Effluent Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters (Feb 1991)

37. Guidelines for the Design of Small Sewage Treatment Plants (Mar 90)

38. Guidance Notes on Discharges from Village Houses (July 1992)

39. Application of the Environmental Impact Assessment Process to Major Private Sector Projects (Advice Note 2/92)

40. Environmental Controls Relevant to HKIEC Industrial Estates (Advice Note 1/92)

41. Environmental Guidelines for Planning in Hong Kong, a joint publication of EPD and the Planning Department

42. Yuen Long & Kam Tin District Sewerage Master Plan (leaflet) (C only)

43. Guidance Notes on Discharges from Village Houses (July 1992)

Others

1. Application of the Environmental Impact Assessment Process to Major Private Sector Projects (Advice Note 2/93)

2. Environmental Controls Relevant to HKIEC Industrial Estates (Advice Note 1/92)

3. Environmental Guidelines for Planning in Hong Kong, a joint publication of EPD and the Planning Department

4. 50 Ways to Save Money and Our Environment

5. 3-R's New Generation (leaflet)

6. Waste Paper Recycling from Home/Office (booklet)

Footnote

* also on sale at the Government Publications Centre C-Chinese version E-English version

Annex H

List of EPD Booklets, Leaflets and Reports

General

1. Hotline Leaflet
2. Pollution — A Time to Act (Summary) May 89 (C&E)
3. First Review of Progress on the 1989 White Paper (May 1991)
4.* Environment Hong Kong 1992 (C&E) ($22) (C-Aug 92, E-Aug 92)
5. Fact Sheet (Sept 91) (C&E)
6. White Paper Pollution in Hong Kong — A time to act (June 89) (C&E)

Air

1. A Concise Guide to the Air Pollution Control Ordinance (Jan 89)
2. A Guide to the Air Pollution Control (Smoke) Regulations (Sept 91)
3. Stop Smoke Emission from Motor Vehicles (leaflet)
4. A Guide to the Air Pollution Control (Furnaces, Ovens & Chimneys) (Installation and Alteration) Regulations (Jan 89)
5. A Guide to the Air Pollution Control (Appeal Board) Regulations 1983 (Jan 89)
6. A Guide to the Air Pollution Control (Specified Process) Regulations (Jan 89)
7. A Guide to the Air Pollution Control (Dust & Grit emission) Regulations (Jan 89)
8. A Guide to CFCs and Halons (Jan 90)
9. Code of Good Practices for the Operation of Liquid Fuel — Fired Commercial, Industrial and Domestic Appliances (Mar 90)
10. A Concise Guide to the Ozone Layer Protection Ordinance (Jan 91)
11. Dark Smoke Costs (leaflet)
12. A Guide to the Air Pollution Control (Fuel Restriction) Regulations (Aug 90)

Noise

1. A Concise Guide to the Noise Control Ordinance (Feb 91)
2. Technical Memorandum on Noise from Percussive Piling (Oct 90)
3. Technical Memorandum on Noise from Construction Work other than Percussive Piling (Jul 91)
4. Technical Memorandum for the Assessment of Noise from Places other than Domestic Premises, Public Places on Construction Sites (July 91)

5. A Practical Guide for the Reduction of Noise from Construction Works (July 89)
6. How to apply for a Construction Noise Permit (Oct 91)
7. A Practical Guide for the Reduction of Industrial Noise (Oct 89)
8. What to do when you receive a Noise Abatement Notice (May 89)
9. A Guide for the Reduction of Ventilating System Noise
10. Application of Screening Structures to Abate Noise from Surface Transportation

Wastes

1. Code of Practice on the Handling, Transportation and Disposal of Asbestos Waste (C&E) (Jan 93) (revised version)
2. Code of Practice on the Handling, Transportation and Disposal of Polychlorinated Biphenyl Waste (C&E) (Dec 92) (revised version)
3. Waste Disposal Plan for Hong Kong (C&E)(Dec 89)
4. Livestock Waste Control Scheme (May 90)
5. Code of Practice: Livestock Waste Management (May 88)
6. 'Dry Muck-out' — Pamphlet
7. Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes (C&E) (Oct 92)
8. A Guide to the Chemical Waste Control Scheme (C&E) (Sept 92)
9. A Guide to the Registration of Chemical Waste Producers (C&E) (April 92)
10. Control of Chemical Waste (leaflet) (C&E)
11. Registration of Chemical Waste Producers (leaflet) (C&E)

Water

1. Water Pollution Control Ordinance — Tolo Harbour and Channel Water Control Zone (information booklet) (April 1991)
2. Water Pollution Control Ordinance Southern, Junk Bay and Port Shelter Water Control Zones (information booklet) (Nov 1991)
3. Water Pollution Control Ordinance the Deep Bay and Mirs Bay Water Control Zones information booklet (Feb 1991) (out of stock)
4. Water Pollution Control Ordinance — North Western Control Zone information booklet (April 1992)
5. Hong Kong's Sewage Strategy (out of stock)
6.* River Water Quality in Hong Kong for 1991 ($28) (E only) (Mar 91)
7.* Marine Water Quality in Hong Kong for 1991 (E only) ($46) (Mar 91)
8. Technical Memorandum on Standards for Effluent Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters (Feb 1991)
9. Bacteriological Water Quality of Bathing Beaches in Hong Kong (E only) (Feb 92)
10. Guidelines for the Design of Small Sewage Treatment Plants (Mar 90)

Annex I

Existing Subject Syllabuses with Topics Related to Environmental Education

Primary	Social Studies Health Education Science Art and Craft
Secondary	Integrated Science Biology Human Biology Physics Chemistry Geography Social Studies Liberal Studies Economic and Public Affairs Government and Public Affairs Religious Education/Studies History Chinese History Home Economics Art and Design

A wide range of topics are included in these subjects to cover the aesthetic, moral, social, technological, scientific and linguistics areas of experiences so that knowledge, skills and attitudes conducive to environmental education can be promoted. Appendix 3 of the "Guidelines on Environmental Education in Schools" provides a detailed list of environmental education topics included in various subjects.

Guidelines on Environmental Education in Schools

The "Guidelines on Environmental Education in Schools" was issued to schools by the Education Department in July 1992. It identifies the guiding principles for and provide practical suggestions on the implementation of environmental education as a cross-curricular theme through the formal and informal curricula both inside and outside school. It also highlights practical considerations on co-ordination and provides examples on teaching specific topics and organizing activities.

Resource and Training Support

A variety of teaching materials, including learning packages, audio-visual materials are available for loan to school upon application to the Audio-visual Resources Library of the Education Department. The Department also works closely with non-government organizations in producing resource materials, for example, professional advice was given to the Environmental Campaign Committee in producing the environmental protection teaching kit "Let's All Make It A Greener World" for primary schools in 1992. Besides, in-service training courses

are organised to familiarise school teachers with ideas and means to implement environmental education. During school visits on environmental education, specific advice to meet the need of individual schools is also given.

Activities for Pupils

The Education Department organises and jointly organises with other government departments or non-government organisations a variety of activities for school pupils, e.g. camps, visits and various competitions. Activities such as the Schools Environmental Awards Scheme are well received by schools and are effective in raising pupils' environmental awareness and concern for protecting the environment.

Annex J

The Business Charter for Sustainable Development Principles for Environmental Management: International Chamber of Commerce

Foreword

There is widespread recognition today that environmental protection must be among the highest priorities of every business.

In its milestone 1987 report, "Our Common Future", the World Commission on Environment and Development (Brundtland Commission), emphasized the importance of environmental protection in the pursuit of sustainable development.

To help business around the world improve its environmental performance, the International Chamber of Commerce established a task force of business representatives to create this Business Charter for Sustainable Development. It comprises sixteen principles for environmental management which, for business, is a vitally important aspect of sustainable development.

This Charter will assist enterprises in fulfilling their commitment to environmental stewardship in a comprehensive fashion. It was formally launched in April 1991 at the Second World Industry Conference on Environmental Management.

Introduction

Sustainable development involves meeting the needs of the present without compromising the ability of future generations to meet their own needs.

Economic growth provides the conditions in which protection of the environment can best be achieved, and environmental protection, in balance with other human goals, is necessary to achieve growth that is sustainable.

In turn, versatile, dynamic, responsive and profitable businesses are required as the driving force for sustainable economic development and for providing managerial, technical and financial resources to contribute to the resolution of environmental challenges. Market economies, characterised by entrepreneurial initiatives, are essential to achieving this.

Business thus shares the view that there should be a common goal, not a conflict, between economic development and environmental protection, both now and for future generations.

Making market forces work in this way to protect and improve the quality of the environment — with the help of performance-based standards and judicious use of economic instruments in a harmonious regulatory framework — is one of the greatest challenges that the world faces in the next decade.

The 1987 report of the World Commission on Environment and Development, "Our Common Future", expresses

the same challenge and calls on the cooperation of business in tackling it. To this end, business leaders have launched actions in their individual enterprises as well as through sectoral and cross-sectoral associations. In order that more businesses join this effort and that their environmental performance continues to improve, The International Chamber of Commerce hereby calls upon enterprises and their associations to use the following Principles as a basis for pursuing such improvement and to express publicly their support for them.

Note The term environment as used in this document also refers to environmentally related aspects of health, safety and product stewardship.

Individual programmes developed to implement these Principles will reflect the wide diversity among enterprises in size and function.

The objective is that the widest range of enterprises commit themselves to improving their environmental performance in accordance with these Principles, to having in place management practices to effect such improvement, to measuring their progress, and to reporting this progress as appropriate internally and externally.

Principles

1. **Corporate priority**
   To recognise environmental management as among the higher corporate priorities and as a key determinant to sustainable development; to establish policies, programmes and practices for conducting operations in an environmentally sound manner.

2. **Integrated management**
   To integrate these policies, programmes and practices fully into each business as an essential element of management in all its functions.

3. **Process of improvement**
   To continue to improve corporate policies, programmes and environmental performance, taking into account technical developments, scientific understanding, consumer needs and community expectations, with legal regulations as a starting point; and to apply the same environmental criteria internationally.

4. **Employee education**
   To educate, train and motivate employees to conduct their activities in an environmentally responsible manner.

5. **Prior assessment**
   To assess environmental impacts before starting a new activity or project and before decommissioning a facility or leaving a site.

6. **Products and services**
   To develop and provide products or services that have no undue environmental impact and are safe in their intended use, that are efficient in their consumption of energy and natural resources, and that can be recycled, reused, or disposed of safely.

7. **Customer advice**
   To advise, and where relevant educate, customers, distributors and the public in the safe use, transportation, storage and disposal of products provided; and to apply similar considerations to the provision of services.

8. **Facilities and operations**
   To develop, design and operate facilities and conduct activities taking into consideration the efficient use of energy and materials, the sustainable use of renewable resources, the minimisation of adverse environmental impact and waste generation, and the safe and responsible disposal of residual wastes.

9. **Research**
To conduct or support research on the environmental impacts of raw materials, products, processes, emissions and wastes associated with the enterprise and on the means of minimizing such adverse impacts.

10. **Precautionary approach**
To modify the manufacture, marketing or use of products or services or the conduct of activities, consistent with scientific and technical understanding, to prevent serious or irreversible environmental degradation.

11. **Contractors and suppliers**
To promote the adoption of these principles by contractors acting on behalf of the enterprise, encouraging and, where appropriate, requiring improvements in their practices to make them consistent with those of the enterprise; and to encourage the wider adoption of these principles by suppliers.

12. **Emergency preparedness**
To develop and maintain, where significant hazards exist, emergency preparedness plans in conjunction with the emergency services, relevant authorities and the local community, recognizing potential transboundary impacts.

13. **Transfer of technology**
To contribute to the transfer of environmentally sound technology and management methods throughout the industrial and public sectors.

14. **Contributing to the common effort**
To contribute to the development of public policy and to business, governmental and intergovernmental programmes and educational initiatives that will enhance environmental awareness and protection.

15. **Openness to concerns**
To foster openness and dialogue with employees and the public, anticipating and responding to their concerns about the potential hazards and impacts of operations, products, wastes or services, including those of transboundary or global significance.

16. **Compliance and reporting**
To measure environmental performance; to conduct regular environmental audits and assessments of compliance with company requirements, legal requirements and these principles; and periodically to provide appropriate information to the board of Directors, shareholders, employees, the authorities and the public.

Support for the Charter

The ICC is undertaking an extensive campaign to encourage member companies and others to express their support for the Charter. It has also invited certain international organizations to provide supportive messages.

A list of these companies, and the messages received from international organizations are given in separate leaflets which are normally circulated together with the Charter. They may also be obtained from ICC Headquarters or ICC National Committees in nearly 60 countries.

Annex K

Action for Individuals

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As householders we can reduce energy consumption in a number of ways, for example, by:

- choosing the most energy efficient model when replacing fans, air conditioners and other electrical appliances such as fridges, freezers, washing machines and dishwashers;
- switching off unused lights and appliances, using low energy light bulbs; and
- setting temperature controls at reasonable levels.
- All these actions not only save us money, but also reduce the emission of greenhouse gases which cause global warming.
- As travellers our decisions influence greenhouse gas emissions, as well as air pollution and the quality of urban life. Ways to help include:
- adopting less aggressive driving habits to save fuel;
- keeping cars well-tuned;
- choosing cars fitted with a catalyst;
- buying more fuel-efficient cars;
- sharing car journeys to work with colleagues;
- using trains or buses when we can;
- All this could save us money, as well as improve our environment and health.

As shoppers we can influence retailers and manufacturers and take account of how the goods we choose will affect the environment as we use or dispose of them. We can help the environment by:

- not buying environmentally damaging products, such as those which contain CFCs, or use CFCs in their manufacture.
- buying recycled products where available.
- making our views known to retailers and manufacturers, especially those who do not provide sufficient environmental information to help us choose; and
- not purchasing goods made of scarce materials — such as hardwoods unless they come from a managed source.

As consumers we can reduce the need for landfills by reducing our waste. We can help by:

- Recycling where possible all our paper, rags, cans and glass, pressing manufacturing companies, supermarket chains or major shores to provide better recycling facilities, where necessary;
- making the most of the products we use — for example by reusing plastic bags or buying the reusable cloth bags made available by some green groups; and

- disposing of batteries, waste motor oil or household chemicals properly.
- Children can make a special input to recycling of wastes such as aluminium drinks cans.

As good neighbours we can help by:

- keeping noise to levels that do not disturb;
- putting litter in bins or taking it home.
- keeping our dogs from fouling public places;
- improving the external appearance of our buildings;
- protecting the historic features of our homes and streets;
- preventing our air-conditioners from dripping; and
- avoiding rubbish burning or smoking where it affects others.

As investors we can:

- seek information about the environmental practices of the companies we invest in, and make our views known.

As responsible citizens we can:

- take steps to inform ourselves of the facts relating to our environment through adult education.
- join voluntary bodies active in the environment;
- alert the District Land Office or Environmental Protection Department to possible breaches of planning or pollution controls;
- make our views on the environment clear, not only by what we do, but also telling members of District Boards, Environmental Pollution Advisory Committee and the Legislative Council what we think.

As parents we can teach our children all these things, and be ready to learn from them as they gain new environmental knowledge at school.

As young people we can join the green groups or youth groups that get involved in environmental projects, such as recycling schemes and local environmental studies.