

The Singapore Green Plan

By

Yeo Boon Leng

THE SINGAPORE GREEN PLAN

*Presented by Yeo Boon Leng
Strategic Planning and Research Department
Ministry of the Environment*

ABSTRACT

This paper gives an overview of the Singapore Green Plan, its background, development and goals. The Green Plan is the masterplan for action for the environment for the nineties and beyond. In the Plan, new areas for action have been identified and the action programmes formulated to implement the Plan in these new areas are discussed. One key area is environmental education, to build an environmentally aware and proactive population so that all would be involved in the protection and improvement of the environment. Other new areas in which action would be taken under the Green Plan are the conservation of resources, minimisation of waste, and the promotion of clean technologies, ie. new processes and technologies that produce less pollution. For the improvement of the quality of life, attention would be focused on noise management, while nature conservation is also an area looked into under the Green Plan. The development of Singapore into a regional centre for environmental technology will also be promoted.

INTRODUCTION

The document "The Singapore Green Plan - Towards a Model Green City" was published in May 1992. It sets out the policy directions Singapore will take to realise its long term vision of a model Green City. This would be a city with a high standard of public health and with a quality environment conducive to gracious living. Its citizens would care for their environment and also for the global environment. It would also be a regional centre for environmental technology. The Green Plan sets out the targets and goals to achieve this vision. A follow-up document "The Singapore Green Plan - Action Programmes" was published in November 1993. It sets the action programmes that would be implemented to achieve the vision. This paper describes the background that led to the Singapore Green Plan, the process by which the Green Plan was formulated and the development of the action programmes to implement the Green Plan.

BACKGROUND

The Ministry of the Environment was formed in 1972. In its early years, the preoccupation of the Ministry was the setting up of the basic infrastructure for public health and environmental protection. As Singapore industrialised and urbanised, a proper pollution control system and collection and removal systems for wastes had to be set up. Infectious diseases, vector borne diseases such as

malaria and dengue fever and food borne diseases such as cholera, Non-B viral hepatitis and enteric fevers, had to be brought under control by vector control and regulation of food vendors. By the end of the eighties, much of the basic infrastructure to meet environmental needs, such as removal of solid waste, wastewater and stormwater, were in place. Air and water pollution were controlled through stringent land-use planning controls and tightly enforced emission standards. Living conditions within the city were pleasant, incidence of infectious diseases had declined and the health indices such as average life expectancy and infant mortality rate were comparable to that of the advanced countries.

However, the effects of an increasing population and of rising affluence were beginning to be felt. Experience in other countries shows that as a society grows in affluence, there is a tendency towards profligacy in resource consumption and towards more waste generation. Singapore is proving no exception to the rule. For the nineties, a larger population with growing appetites and higher expectations will make greater demands on resources for environmental protection and will put a greater burden on the environment.

Around the same time, in the late eighties, global environmental issues, such as protection of the ozone layer, global warming, preservation of biodiversity and endangered species and pollution of the sea were beginning to take on a higher prominence. Consensus was growing internationally on the need to take action on these global issues and by the late eighties, international conventions and protocols on many environmental issues were being reached. As a responsible nation in the world community, Singapore participates in these conventions. Commitments under these agreements were beginning to have impacts on our lifestyle and our businesses.

With these new trends, a new approach was needed to environmental management. A major review of policy was carried out at the end of the eighties, the result of which was the Singapore Green Plan.

THE NEW APPROACH

The previous emphasis on the provision of environmental infrastructure, supported by environmental legislation, was realised to be insufficient in itself to meet the challenges of the nineties. Increasingly, environmental issues were impacting on many sectors of industry and society. The best avenue for the preservation and improvement of the environment into the future should not just be the investment of ever more of our limited resources into infrastructure and a proliferation and strengthening of legislation. A better approach is to involve all those affected by environmental requirements and those imposing a burden on the environment to work with the Ministry of Environment on solutions. Public education, co-operation and incentives can complement legislation and fines. A consultative approach was taken. In the review that led to the Singapore Green Plan, all sectors of government were consulted on the goals and targets to be set.

Feedback was also sought from the public. In this way the strategies and directions arrived at will take into account other priorities in allocation of national resources and also public expectations. With this consultative approach, the support necessary for the implementation of measures towards the strategies would also be more likely to be forthcoming.

DEVELOPMENT OF INFRASTRUCTURE

At present, wastewater from nearly all premises in Singapore are collected by sewers to six sewage treatment works for treatment. Solid waste is collected daily and there are three incinerator plants to reduce incinerable refuse to ashes before burial together with non-incinerable refuse in landfill. About 80-85% of refuse collected is incinerable and incineration reduces volume by about 90% and weight by about 80%, thereby conserving the life of the landfills. For the nineties, to meet the increasing amounts of wastewater and solid waste that will be generated, major extensions and improvements to the sewage treatment works and solid waste treatment facilities would be required. For the sewage treatment works, during the extensions, the design of the works would also be updated to the covered-and-compact concept. With this improvement, odour would be contained. The buffer zone around the works could then be reduced from 1 kilometre to 500-200 metres, freeing up to 1,200 hectares of land for high value residential and similar development. The estimated cost of the extensions of the four sewage treatment works required over the next 5 years to cope with increasing flows is \$950 million. For incinerator plants, the third incineration plant, commissioned recently in August 1993, had cost \$560 million. A fourth plant may become necessary if refuse generation continues to grow. For landfill, the only landfill site left in Singapore, the Lorong Halus landfill, is expected to run out of capacity by about 1998. There are no suitable landfill sites left on the main island and the next landfill would be off-shore, east of Pulau Semakau. The cost of development of this new landfill site is expected to be over \$1 billion. Very high costs in investment in infrastructure and operation are therefore required to treat pollution and waste after they are generated. The prevention of generation of pollution and of waste, by the encouragement of clean technologies and resource conservation, are important new directions identified in the Singapore Green Plan.

NEW DIRECTIONS

The Green Plan had identified new strategic directions that would have to be addressed if the goals and targets were to be met. These new areas are multi-dimensional and require inputs from many sectors. The method chosen to arrive at action programmes for these new directions was the formation of Workgroups, with members drawn from public and private organisations with the expertise to input to the action programmes. Workgroups were formed for action programmes on environmental education, environmental technology, resource conservation, clean technologies, nature conservation and environmental noise. Feedback and comments were sought from the public and from all interested parties before the

action programmes proposed by workgroups were finalised. By this method, the resulting action programmes would be likely to represent the best possible compromise that can be reached, given the many conflicting demands.

THE ACTION PROGRAMMES

The action programmes formulated by the workgroups are detailed and definite. In their reports, the workgroups have identified the lead agencies to carry out each of the action recommended and have also suggested tentative target dates for completion.

Environmental Education

For environmental education, the action programmes that will be carried out aim to make environmental education a life-long process. Environmental education would be consciously integrated into the formal education system. It would be part of tertiary education so that our graduates and professionals would start off their working life with a good grounding in environmental issues. For the general public, the propagation of interest and knowledge on the environment would be through campaigns, through exhibitions and through the media. Organisations that reach out to large segments of the population, such as the Singapore Armed Forces, through national service, and the People's Association, through the community centres, Citizens' Consultative Committees and Resident's Committees, would cooperate to spread information and commitment on the environment. Groups with influence, such as consumers and the corporate world, have been targeted for special attention. An eco-labelling scheme, the Green Labelling Scheme, will provide consumers with information on environmentally friendly products while environmental auditing will be promoted for businesses and industries. The action programmes also call for the Environment Resource Centre at the Ministry of the Environment to be developed into a national centre and focal point for information on the environment.

Resource Conservation

On resource conservation and waste minimisation, between 1970 and 1991, there has been a 7 fold increase in energy consumption to 16,000 GWh/year and a nearly fourfold increase in waste generation to 2.15 million tonnes/year. The generation of energy is by burning of fossil fuels and this also inevitably generates pollution. The action programmes will moderate increase in energy demand by improving national energy efficiency and will arrest the trend of increasing waste generation. Industry and commerce are the main consumers of energy while domestic premises account for about 18%. The action programmes include many measures aimed at industrial and commercial establishments to promote the adoption of energy efficient technologies and equipment. For waste generation, industrial and commercial waste made up 51 percent of the waste, while domestic and trade waste accounted for 49 percent. Bold targets have been set for reduction of waste generation. For domestic and trade waste, the target is to

reduce waste generation from a current per capita rate of 1.1 kg per day to a rate of 0.9 kg per day by year 2000. This would be achieved through measures to promote purchasing and consumption habits which results in less waste, through encouragement of minimal packaging and through promotion of recycling. For industrial and commercial waste, targets have been set for recycling by year 2000; of wood and timber of 40 percent, of paper and cardboard of 60 percent, of plastics of 50 percent, and of construction and demolition debris of 20 percent. The setting up of recycling systems and recycling plants would be encouraged.

Clean Technologies

With further development of Singapore, with factories and buildings covering more and more of the island and more vehicles on our roads, more emissions of pollutants into the environment can be expected. This can lead to a deterioration in our air quality. The Green Plan calls for the air quality to be maintained and improved and the action programmes to ensure this include measures to control sulphur oxides emissions from power stations and refineries, stricter emission standards for industry and vehicles and promotion of the use of cleaner fuels, of renewable energy, of cleaner modes of transport and of new technologies that cause less pollution and less damage to the environment. The action programmes also include measures to assist companies to phase out their use of ozone-depleting substances (ODSs) such as chloroflourocarbons (CFCs).

Environmental Technology

Over the last twenty years, Singapore has accumulated experience and expertise in environmental management and application of environmental technology. There is demand for a wide range of environmental products, services, and technology in the region and Singapore has the capacity to share its proven expertise in a number of areas. The action programmes for the development of environmental technology include measures to promote Singapore as a regional hub for environmental business, to promote Singapore as a regional centre for environmental events and activities, to attract foreign ET companies to operate in/from Singapore to assist local ET companies to export technical and R&D expertise and to strengthen local technical and R&D expertise.

Nature Conservation

The Green Plan aims to protect and conserve some of Singapore's most important areas of natural beauty and biodiversity by providing for 5 percent of total land area to be set aside as nature conservation areas. Nineteen sites have been identified and the National Parks Board will monitor and coordinate measures required to maintain the health of the nature areas. Flora and fauna corridors linking up nature areas to enhance biodiversity will be considered between the Bukit Timah Nature Reserve and the Central Catchment Nature Reserve and between the two mangrove areas of Sungei Buloh and Kranji Dam. Nature appreciation would be promoted.

Environmental Noise

To maintain noise levels within acceptable limits as Singapore develops further require that action be taken for an integrated pro-active approach to noise management. The action programmes for environmental noise call for a unit to be set up to harmonise policies and standards and coordinate between authorities on implementation of controls and for a monitoring programme to identify noise abatement measures for areas with high noise levels.

IMPLEMENTATION

The implementation of the action programmes under the Green Plan will be overseen by a steering committee. This is an inter-ministerial committee which members are senior civil servants from the ministries most involved in the implementation. The committee will promote the action programmes, monitor progress and review the programmes if necessary. The successful implementation of the programmes will enable the achievement of the vision of a model Green City.

References

"The Singapore Green Plan - Towards a Model Green City ", May 1992, Ministry of the Environment, Singapore

"The Singapore Green Plan - Action Programmes", November 1993, Ministry of the Environment, Singapore