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SPEECH BY MR BERNARD CHEN, MINISTER OF STATE FOR DEFENCE,  
AT THE SEMINAR ON POLLUTION PREVENTION AND  
ENVIRONMENTAL CONSERVATION ON FRIDAY, 28 APRIL '78  
AT 10.00 A.M. AT THE GARDENIA ROOM, SHANGRILA HOTEL

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I am pleased to be here this morning to officiate at the Opening of the Seminar on Pollution Prevention and Environmental Conservation, organised by the Science Council of Singapore and the Singapore Manufacturers Association. It is encouraging to see that both the public and private sectors have come together to discuss this topical yet important subject.

Many of us have asked the question - "Why pollution prevention and environmental conservation?" It is interesting to note that the concern of conserving the environment through curbing pollution and improving the environment itself gathered momentum only in the post World War II era. In fact, little attention was paid to these environmental issues until a decade or so ago. Perhaps a look at history will give us some explanation as to how such concern was generated.

Industrialisation of the form that we experience today started really in England in the 18th century with the Industrial Revolution. At that time, world population was relatively small. Much of this population was in the rural areas. The vast expanse of land and the negligible contamination caused by urban activities had made the impact of pollutive activities insignificant. Given the social conditions of that age, when economic well-being was rather rare, amongst the masses, saved the landlords and the budding industrialists, it was not surprising that no attention was paid at all to environmental conservation. When industrialisation was brought to Europe and the United States and much later, to the other parts of the world, the same situation applied, that is abundance of land and natural resources, relatively small population and insignificant impact of pollutive activities. This state of affairs went on for much of the 19th century and the early part of this century.

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It was not until after the first World War when the various scientific and technical innovations such as diesel and petrol engines, coal fired and later oil fired power stations and heavy industries such as steel and iron and petrol chemicals, were introduced, that we began to detect a structural change in the Environment. This period also saw a rapid increase in world population taking shape. After World War II, the world economic machine really revved up. Coupled with the even more rapid increase in population as most countries experienced post-war baby booms, we find that the original happy situation of abundant physical resources and insignificant pollutive activities no longer obtained. The impact of various human activities on the Environment is now not only sufficiently adverse to threaten its conservation, but more so, these effects are now being passed back to the producers themselves. The years of sustained economic growth have also improved the living standards of many countries of the world by such an extent now that the people demand a higher standard of environmental comforts. Starting from the United States in the 1960s, and followed by the other major industrialised countries in Europe and lately, Japan, the momentum for environmental conservation has been rapidly built up. Today, even many of the developing countries in the process of industrialisation, including Singapore, have paid much more attention to these issues.

There are several lessons we can learn from the experience of the industrialised countries. Firstly, once any change of the environment has taken place, it is extremely costly and difficult to rectify the situation. Preventive measures, if feasible, are more effective and cheaper in the long run. Second, as economic development takes place mainly through industrialisation, the levels of pollution caused by economic and social activities that came along with development will also grow in keeping with the rates of development unless the levels of pollution are properly controlled. In a way, therefore, economic growth and pollution are synonymous if a free play of forces is allowed. Third, as the industrial base broadens, the variety of pollutants and the types of damages inflicted on the environment whether it is air, water or noise will also proliferate and more sophisticated methods will have to be adopted to measure their effects as well as to curb their impact. It also means that these methods will be more costly.

6 How has Singapore dealt with the problems of pollution and environmental conservation? For us, these problems assume acute proportions, given our limited land size and the high concentration of population. The need to optimise our scarce sources to achieve reasonable rates of economic growth, leading to better lives for the people and yet to conserve the environment posed a great challenge to our policy makers and planners. We are fortunate that environmental considerations, in as much as they were practicable have been incorporated in our development programme and measures to improve the environment and control of pollution were implemented in phase with the pace of development rather than as a once-and-for-all programme. It is useful for us to review how we went about doing this.

Our first effort in conserving the environment through control of pollution had modest beginnings in 1968 when we started the Keep Singapore Clean Campaign. This took the form of a month long campaign to educate the public not to litter the streets, drains and other public places. Human nature being what it is, especially with Singaporeans, disincentives including fines of up to \$500 and adverse publicity in the mass media had to be introduced to encourage the public to fall in line. These measures, though proved to be highly unpopular initially, were ultimately accepted after several more campaigns. They would not have been successful if not for the Government's efforts in facilitating this public effort by providing the means, such as litterbins and strict enforcement of the regulations. The second effort was directed at improving the environment. Thus, the Keep Singapore Green campaign was initiated by the Government. Substantial sums were allocated to planting trees and shrubs in urban areas to reduce the stark image of the concrete jungles. The private sector was encouraged to beautify their premises in a similar manner. Again, there was quite some resistance. All this meant more expenditure, sometimes considered quite unnecessary by the owners of the properties. It took some time to drive the point home. Eventually, we succeeded in calling Singapore a Garden City. This took us almost a decade.

The first major step in controlling pollution was directed at air pollution. The severity of air pollution can be measured

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by two indicators. Firstly, the number of industrial establishments. In 1962, we had 642 manufacturing establishments with 10 or more workers having output valued at \$1,740.7 million. By 1976, we had 2,545 establishments with output valued at \$16,175.70 million. Even accounting for inflation, the increase in value output, which gives a good indication of the volume of business is phenomenal. Secondly, the increase in the number of motor vehicles. From 101,000 in 1960, the number has increased to 290,000 in 1977. The corresponding figures in private motor vehicles were 63,000 in 1960, and 132,000 in 1977. The figures for 1977 would have been higher if not for the measures introduced in 1975 to discourage car ownership. It has been estimated by a study done in 1974 that motor vehicles contribute about 67% of total pollutants in Singapore in the form of engine exhaust waste gases. Action was taken to control emission of these pollutants. In terms of legislation, the Clean Air Act was passed in 1971, followed by a number of other environment acts, including the latest Clean Air (Standards) Amendments Regulation, 1978. Apart from these legislative measures, Government through its Anti-Pollution Unit, has also set up monitoring systems to keep track of emission of dust, sulphur dioxide, carbon monoxide, nitrogen oxides and several other noxious gases. The results are so far encouraging. Even though Singapore air pollution levels are higher in industrial and urban areas, as to be expected, the annual averages for total acidity, smoke and suspended particles are well below the WHO long term goals.

The next major step taken was to contain water pollution, especially those caused by industrial effluents. Our limited waterways and the need to keep our water catchments free from pollution added some sense of urgency to this control. The Ministry of the Environment monitors the inland waters which are tested for a large number of parameters under legislation covered by the Water Quality Standards. The Water Pollution Control and Drainage Act was enacted in 1975 to enforce such requirements. In addition to controlling industrial liquid wastes, there were also moves to provide centralised hawker centres with amenities that led to higher standards of cleanliness. Water pollution problems were minimised by channelling effluent discharges into sewers. Farm wastes, consisting mainly of poultry and pig wastes have been a major problem for our

water catchments. This will be resolved to a large extent when the majority of pig farms are moved to Ponggol where wastes will be treated before discharge into the sea.

Finally, a word on solid waste disposal which few people worry about. Currently, about 2,000 tons of rubbish have to be disposed off through dumping at Lim Chu Kang and Lorong Halus in Tampines. Landfill, however, does not provide a permanent solution given our scarcity of land. The Ministry of the Environment is building a \$85 million incinerator at Ulu Pandan, to be operated by the end of this year which will provide a much more efficient means of disposing garbage. Although there will still be some trade off as a certain degree of air pollution is inevitable, but this is within bounds.

On the whole, therefore, Government has been able to implement much of the practicable measures to control pollution and improve the environment. Most of the public have also responded positively to the measures proposed. Some degree of success has been achieved in certain areas. Much more remain to be done in other areas especially in respect of the industrial sector. Here, the industrialists as well as Government must play their respective roles in ensuring that realistic targets are set and objectives are achieved.

Pollution from industries are especially insidious because the pollution sources are fixed at stationary sites and therefore effluent discharges are in high concentration. The composition of the effluent discharge, depending on the types of industries may also be extremely noxious or toxic. For the new industries, especially those set up in the early 1970s, there had not been much problems in installing anti-pollution equipment and facilities as these could be incorporated in the designs of the plant and machinery and factory premises. The cost of these anti-pollution measures is also not as substantial compared to the overall capital costs of the project. Depreciated over a longer period, the cost impact of these measures is not as severe. This is provided that the pollution standards set are not too extreme as to make the cost of installing the necessary facilities prohibitive. The same however, cannot be said of industries already in existence. Introduction of anti-pollution

measures may mean major modifications to plant and machinery. In some cases, existing machinery may even have to be replaced. For these industries, some time will be needed before they could comply with anti-pollution requirements. Unlike new industries which could absorb the cost of introducing these measures as part of the capital cost structure, the same measures could pose a great financial burden unless they are phased over a period of time.

13 For both existing and new industries, however, we need a greater degree of environmental consciousness on the part of our industrialists. They should not have to wait till legislation is enacted to compel them to comply with anti-pollution requirements. The concept of minimising pollution and conserving the environment should be an essential element in the planning of their projects as well as operations. While there will be inevitably a trade off between introducing anti-pollution measures and greater profits, national interests dictate they should play their part in ensuring that Singapore's environment is kept pollution free as far as possible. They can be facilitated in doing this with the co-operation of the enforcing agencies.

14 It can well be said that it will be impossible to eliminate pollution if we were to achieve economic development at the rate we want. The question is, therefore, to what extent we should exercise our controls and yet achieve our environmental objectives. It is all too easy to put up stringent standards which few can comply with. We will have a clean environment but little else to show for. Our enforcement agencies should, therefore, be realistic in setting targets within the financial reach of industrialists. For existing industries to comply with new standards, sufficient grace period should also be given to enable them to install the necessary facilities. Needless to say, industrialists will be duty bound not to take advantage of these concessions and delay the implementation of the required measures or refusing to comply with the requirements altogether.

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The final answer lies in a joint effort by the public, the industrial sector and the Government enforcement agencies. There could be more consultations between the enforcement agencies and the industrialists before pollution standards are prescribed. It is therefore timely that joint seminars such as this one today is being organised by the Science Council and the Singapore Manufacturers Association. In your two days of deliberation, I hope that participants will have the opportunity of exchanging views with one another with as open a mind as possible. I wish you all success in arriving at a better understanding of the issues involved and perhaps come up with some concrete suggestions on how the twin objective of economic growth and conservation of environment can be achieved without great expense to each.

I now have great pleasure to declare this Seminar open.