

## CASE STUDY 4: HAZARDOUS WASTE MANAGEMENT IN MALAYSIA

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### Summary

This article focuses on hazardous waste management in Malaysia, a country undergoing a rapid process of urbanization and industrialization. The manufacturing sector significantly contributes to the generation of hazardous waste, and the generation rate has been increasing constantly, especially since the 1980s. In 1974, the Environmental Quality Act (1974) was enacted, and the Department of Environment was established. Since then, many regulations on hazardous waste were introduced, including those addressing the definition and classifications of hazardous waste, as well as collection, storage, transportation, treatment and disposal facilities. Hazardous waste facilities manage three types of waste: “hazardous”, clinical and radioactive wastes.

The government changed the emphasis from end-of-pipe solutions to zero-discharge-engineering in the late 1990s. In order to promote zero discharge, the Malaysian government introduced a 60% tax rebate on waste management resource recovery expenditures in the fiscal year 2001. The use and management of various chemicals, including toxic chemicals, are controlled under various acts: Poison Act 1952 (Revised 1989), Food Regulations 1985 (under the Food Act 1983), Control of Drugs and Cosmetic Regulations 1984, and the Occupational Safety and Health Act 1994.

The framework for the systematic management of toxic chemicals is still in the construction stage. The central focus of hazardous waste research and development in Malaysia is towards developing a sound hazardous waste management system. This

research is conducted mainly by universities, government research institutes and private companies. For the most part, the framework for hazardous waste management is already in place in Malaysia.

## 1. Introduction

Malaysia, a country with 22.2 million multi-ethnic inhabitants (according to the census for the year 2000), is striving towards becoming an industrialized nation by the year 2020. With the current population growth rate at 2.6%, rapid progress in urbanization and industrialization has brought forth a significant increase in physical infrastructure and industrial developments. In terms of sectoral development, the contribution of the manufacturing sector to the GDP increased from 11% in 1966 to 24% in 1988.

The growth of the manufacturing sector had already increased by 13% from 1991 to 95, and it was the leading sector in the Malaysian economy with an output accounting for 33.1% of the GDP. This significantly contributed to the generation of hazardous waste. Thus, pollution control has been implemented to combat the degradation of the environment in Malaysia, particularly degradation caused by the industrial sector.

The government of Malaysia estimates the following percentage contributions by individual sectors to industrial pollution: food processing (40%), rubber and palm oil industries (35%), industrial chemicals and electronics (12%) and textiles (9%). Two studies conducted for the Department of Environment in 1987 indicated that a total of 377 000 tons of hazardous waste were generated annually by various industries in Peninsular Malaysia, and this figure increased to 420 000 tons in 1994.

In terms of policy, the Malaysian government's emphasis was more towards end-of-pipe solutions to hazardous waste in the 1980s to early 1990s. This is due to the fact that environmental awareness and basic infrastructures must first be put in place to cope with the voluminous wastes produced by various industries. However, the emphasis in the late 1990s was more focused towards cleaner production and zero-discharge-engineering, which were aimed to achieve pollution prevention and sustainable development.

From the perspective of government policy, the progress in the management of hazardous substances and waste resulted from:

- The intensification of enforcement of the Environmental Quality Act of 1974;
- The preparation of a code of practice for hazardous waste management;
- The institution of environmentally sound management of toxic chemicals, and
- The enhancement of chemical safety, especially relating to banned and severely restricted chemicals.

Efforts were made in the late 1980s to develop comprehensive legislation to control the use, storage, handling, transport, labeling and disposal of toxic chemicals. In December 1991, the government gave exclusive rights to a consortium to build, operate and maintain a centralized and integrated facility with a maximum capacity of 400 000 tons of waste per year at Bukit Nanas, Negeri Sembilan for the collection, storage, treatment

and disposal of hazardous waste. The government also provided incentives like tax rebates to industries to adopt clean technology and to promote the recovery and re-utilization of waste.

In order to meet the policy target, various strategies and programs have been implemented by the government. These include legislative control, proper collection, treatment and disposal facilities, supporting services and economic incentives. The private sector has also responded positively by forming the Malaysian Business Council for Sustainable Development. A few NGOs are also actively involved in decision-making at various levels to ensure proper hazardous waste management.

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### **Biographical Sketch**

**Zaini Ujang** is a Professor of Environmental Engineering, and Director of the Institute of Environmental & Water Resource Management, at the University of Technology, Malaysia. His research interests are centered on industrial wastewater and sewage treatment and reuse, particularly using membrane processes and advanced techniques in biotechnology. He owns two patents, on a storm water filter and software for designing wastewater treatment plants. He is an editorial board member of the journal of the International Water Association, Water Science & Technology, and Issue co-editor for the IWA Publishing Book Series on Sustainable Technology for Developing Countries. He has published more than 150 articles in refereed international journals, proceedings, books and monographs. Professor Ujang lives with his wife and four children in Johor Bahru, Malaysia.