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## 1. Introduction

China is a developing country which has one billion population. In order to accelerate the modernization, the policy of "reform and opening of economy" has been carried out at present. In the process of industrialization, the life style of people has been changed. In same time the level of solid waste management remains low because of economic condition. Therefore, the solid waste disposal facilities may be causing environment pollution and threatening human health.

## 2. Present Status of Solid Waste Management

### 2.1 General

It is not so serious problem for solid waste in rural area of China. The domestic waste which is generated in countryside may be disposed of in the generation points by various simple ways. But the municipal solid waste (M.S.W.) management in large and middle cities has become a emergency problem which should be solved immediately. The quality and quantity of waste may vary and depend on region, season, size of municipality, economic condition and life style. There are 354 municipalities in China. The population in cities is 140 million. Annual waste generation is about 50 million tons and main portion is coal ash (56% of total). Most of them are transported to open dumping sites. In Beijing, for example, huge "circle-like waste mass" was formed outside San Human Road before the end of 1983. There are about 4500 sites of those. One site is as large as 50 m<sup>2</sup>. Waste masses occupy huge land. Those may pollute natural environment and spoil the appearance of the city streets. Meanwhile those have breded mosquitos and flies. With the reform and opening of economy policy, more and more farmers have move into cities. The population has been increased in cities and the "township enterprise" has been developed. It results in remarkable increase of waste discharge and more complex of waste

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composition. The central government and local governments have paid attention to these problems. But it is hard to solve them in short period effectively because they are accumulated in many years.

## 2.2 Management Organization and Its Responsibility

In China, solid waste management has been involved by two ministries. The Ministries of Urban and Rural Construction and Environment Protection as well as these branches are responsible for construction of facilities (such as public toilet, and collection, transportation and disposal facilities), daily collection, transportation and disposal of waste. The Ministry of Public Health is responsible for the hygienic monitoring and supervision. There is National Patriotic Health Campaign Committee (PHCC) as well as its branches in province, municipality and county governments. These are responsible to organize the relevant organizations to carry out health work, to educate people to promote daily hygienic work (such as supplying of safe drinking water in rural area, waste collection and disposal in urban and rural area).

## 2.3 Existing Relevant Laws and Regulations

In China, the "National Law of Environment Protection" was announced and enacted in 1979. It demands strictly to protect water resource for drinking water, by improving the purification of waste water and facilitating for waste disposal gradually. In large and middle cities, space they have management regulations for municipal environment hygiene, as well as management agencies for municipal environment hygiene which have organized the people to carry out "three keeps in front of door" (To keep "cleaning", "planting tree" and "in order").

## 2.4 Manpower, Equipment and Financial Situation

(1) The cleansing workers have engaged on collection, transportation, treatment and disposal of solid waste in China. In recent years, the cleansing workers have increased from 152,000 persons in 1979 to 240,000 persons in 1986 (increased 57% within seven years). Because various measures have been adopted by the government, cleansing workers's position and welfare have been improved substantially. However, the education level of cleansing workers is still low. Among the cleansing workers, workers with college diploma are 0.6%, high school graduates are 10.7%, and secondary school graduates are 5% according to the investigation of the Ministry of Urban and Rural Construction and Environment Protection.

(2) There are two types of containers which are used in China. Those are concrete, and large container for mechanical hauling. Refuse discharging

chutes were built in buildings some area. The transportation cars have increased almost double from 3798 cars in 1979 to 9352 cars in China in 1985. But some cars are not in good condition. Therefore, it is hard to satisfy the increasing requirement of waste collection and transportation. To increase the number of cars and renew of them are essential.

(3) The finance for cleansing work has been increased almost triple from 260 million Chinese yuan in 1979, to 750 million Chinese yuan in 1986. During "Sixth Five Fiscal Years Period", the total expense, is scheduled to be 2180 million Chinese yuan for municipal cleansing. The 12% of the total expense (270 million yuan) is for basic construction. And 88% is for maintaining of facilities. (now 1 Chinese yuan = 33 Japanese yen)

## 2.5 Treatment and Disposal of Municipal Solid Waste

In China, the main disposal method is open dumping. Other methods are high rate composting, sanitary landfill and incineration. One incineration plant has been built and operated in Guangdong Province. The capacity of it is 300 T/D.

## 3. Resource Recovery and Recycling in China

Active resource recovery and recycling activities have been started since 1958 in China. The purpose of resource recovery in China is different from Japan. In Japan, in addition to valuable material (such as aluminum can, steel can, newspaper, magazine, book, glass bottle, cloths, etc.) recovery, reduction of waste volume for transportation and disposal is an important objective of recycling. Recycling is promoted all over Japan. In China, resource recovery is performed from the view point of economic benefit and resource conservation. Under the direction of "Work hard and save for the nation", several ways of material recovery have been used since 1950s for development of the nation. The promotion of recycling is charged by the Ministry of Commerce. Under the Ministry, waste recycling companies and shops have carried out the recycling activities. The methods of recycling are 1) households sell their waste to recycling shop, 2) dealers collect usable resource from door to door, 3) salvage by pickers and 4) recycling shops collect usable wastes.

These recycling methods are welcomed by people because those are beneficial not only to the nation but also to people. This recycling system has been effective for more than 30 years. There are 2700 recycling companies, 100,000 recycling shops and thousands workers and dealers in China. From the recycled materials, a lot of treasure of historic and cultural legacy have been obtained.