

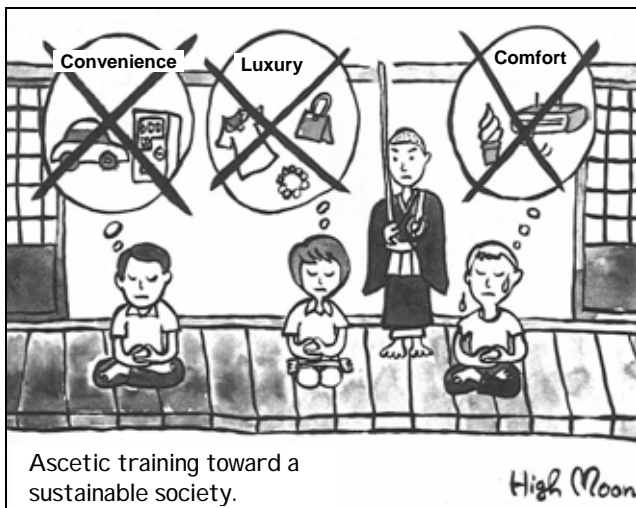
**Dear Waste Management Experts**

The securing of landfill sites has been one of the most serious aspects of SWM in Japan because of the limited amount of flat land. Therefore, most of the large cities dispose of all municipal waste by incineration and promote a zero residue policy by adopting melting furnaces. However, that's still not enough!

In this issue of our newsletter, we introduce two cases of municipalities working toward sustainable SWM - one is through waste reduction and the other is through landfill site excavation. As a series of articles on Japanese ODA by JICA, SWM improvement in Vientiane, Laos is reported.

JSWME is going to hold the 15th annual conference during November 17-19, in Takamatsu, Kagawa. The international relations committee will arrange an international poster session and a symposium on biomass on the first day.

(Hideo Azuma)



Ascetic training toward a sustainable society.

Comments by High Moon: "We need to adopt a simple and slow way of life from now on."

Illustrated by Prof. Hiroshi Takatsuki (Taka-tsuki literally means "High Moon".) Taken from the Monthly "the Waste", May 2004 and translated by JSWME.

**Landfill Renaissance:  
Japan's Challenge**

**1. Current situation of landfills in Japan**

Japan's basic principle of waste disposal is to prevent waste generation in the first place, then reduce the volume, detoxify and stabilize the waste and dispose of only the final residue, as land is scarce in Japan and it is hard to locate a new final disposal site. Many treatment facilities such as incinerators and waste crushing plants have been developed. As a result, a major part of waste that is landfilled now is residue from incinerators or the incombustible portion of crushed waste.

On the other hand, landfills used before the 1970's, when incineration became popular, contain waste which did not undergo intermediate treatment. In landfills used during the period from 1970 to the 1980's there exist both intact waste and incineration residue. Therefore, waste with high organic content such as food waste remains in such old landfills, causing offensive odor and foul leachate and deteriorating the impression of landfills. This is one reason why it is difficult to procure sites for new landfills.

**2. Difficulties with landfills and significance of landfill renaissance**

The municipal landfills in Japan face such issues as follows.

- Due to the spreading mistrust of landfills among citizens, it is difficult to achieve public consensus which is a prerequisite of new landfill development.
- Some old landfills need functional rehabilitation for environmental conservation.
- Some old landfills may provide empty space for further waste disposal by applying present technologies for waste volume reduction and stabilization.
- Many landfills were closed without meeting the abolition requirement and have been idle for long time.

Therefore, it is thought that the renaissance of landfills by excavating old landfills and treating and/or reutilizing

landfilled waste can solve environmental problems such as odor and leachate, eliminate the adverse legacy and create new space for waste disposal. It will also be possible to minimize the environmental risk by repairing and fixing the leachate drainage system beneath the landfills when excavated.

### 3. Technical Committee for Landfill Renaissance

Under such circumstances, many municipalities have a strong interest in landfill renaissance, and the systematization of renaissance technology is needed. By the initiative of the Japan Environmental Sanitation Center (JESC), the Technical Committee for Landfill Renaissance was established in FY 2001. The committee, headed by Prof. S. Higuchi of Fukuoka University, restarted in the following year with new members. It has at present 29 member companies and nine advisors divided into a planning group and a renaissance system group under the administration of JESC. The committee aims to investigate the features of various landfilled waste layers in old landfills, examine renaissance technology appropriate to waste characteristics, and recommend economical and comprehensive technical systems for landfill renaissance. Specifically, the subjects of the committee include the following.

- a. Background of the application of landfill renaissance (necessity, renaissance technology and its applicability, case study)
- b. Clarification of legislative conditions for the redevelopment of old landfills
- c. Establishment of a preparatory study method (landfill history study, study to explore landfilled waste, study of condition and characteristics of landfilled waste layers, and others)
- d. Establishment of renaissance technology (technology for waste excavation, segregation, storage, haulage, melting, reutilization and others)
- e. Establishment of environmental conservation technology (technology to prevent environmental problems due to landfill gas and odor, technology to



Mobile Waste Segregation Equipment

maintain work environment, others)

- f. Establishment of methodology with high cost performance

(Takemi Nakakoshi)

**Municipalities on the Move**  
**-Yokohama G30 Plan-**  
**(Yokohama City Waste Management Plan)**

### 1. Background

The city of Yokohama, well-known as an international port, lies to the southwest of central Tokyo and forms a huge metropolitan area. The over 3.5 million residents of Yokohama produce 1,600,000 tons of rubbish each year (1,274g/day/capita). The increase in municipal waste production has exceeded that of population growth. It is anticipated that the final disposal sites will be exhausted within five years. Under such circumstances, Yokohama City declared *Yokohama G30\* Action* and established the *G30 Plan* in January 2003 to urge residents and businesses to practice the 3Rs (reduce, reuse and recycle), aiming at a thirty percent reduction in waste generation. The G30 plan is also a typical waste management plan, which municipalities are required to prepare according to the Waste Disposal and Public Cleansing Law.

\*Yokohama G30: Slogan of Yokohama City Waste Management Plan. G stands for “GOMI” (“garbage” in Japanese) and 30 is the target (30% reduction of waste).

### 2. Goals of G30

The G30 Plan sets four targets: 1) a reduction in the volume of municipal solid waste by 30% in FY2010 from the current status (FY2001) by promoting the 3Rs; 2) promotion of environmental and reliable waste treatment; 3) eradication of illegal dumping and improper disposal; and 4) reinforcement of cooperation with citizens and businesses.

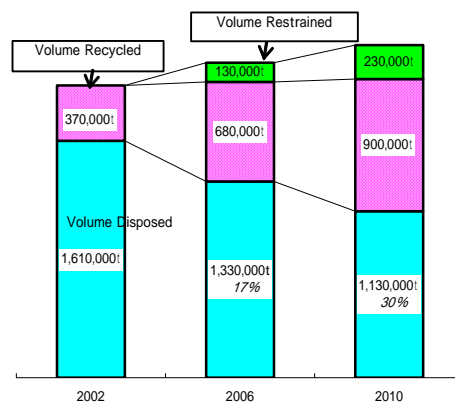


Fig. Reduction target in G30 Plan

### 3. Basic Framework of the Yokohama G30 Plan

The G30 plan specifies that citizens, businesses, and Yokohama City will actively work to restrain waste generation and promote waste reduction by the 3Rs under an appropriate division of responsibilities.

#### (1) Responsibilities of Local Government

Yokohama City, as the authority of municipal solid waste management, shall establish a system to encourage residents and businesses to join in waste reduction activities. At the same time, Yokohama City shall take new measures such as the expansion of separate collection and introduction of a designated collection bag system. Yokohama City shall disseminate knowledge and raise public awareness by providing information on advanced cases, etc.

#### (2) Responsibilities of Citizens

When citizens buy a product, they shall try to select those which have less containers and packaging, and those which are reusable, durable or recycled. They shall also use products as long as possible by carrying out repairs when they get broken in an effort to reduce the volume of waste they generate. When citizens dispose of their waste, they shall cooperate with the separate collection system set by the local government for recycling. A lifestyle which makes the most of goods can cultivate an environmentally sound society as well as reduce garbage generation.

#### (3) Responsibilities of Businesses

Businesses have to properly manage waste generated through their business activities on their own. They shall try to reduce the volume of waste they generate by considering the raw materials, manufacturing processes, etc. they select. In addition, they shall try to properly recycle their waste by working with other businesses to reuse waste generated.

In order to fulfil their producer/distributor responsibility, businesses shall try to manufacture products which are durable and recyclable, and collect and repair used products which they have produced/sold.

(Motoaki Saito)

### Solid Waste Management in Vientiane, Lao PDR and Japanese Assistance

This article outlines the progress of solid waste management (SWM) services in Vientiane from the early 1990s with Japanese assistance.

#### 1. Japanese assistance

(1) JICA (Japan International Cooperation Agency) assisted to formulate a master plan on SWM services

and conducted pilot projects on fee-based waste collection and the improvement of a landfill site in 1991-1992.

(2) The government of Japan granted waste collection vehicles, bulldozers for landfill operation and a maintenance workshop in 1998 to the amount of 705 million Yen, based on the above master plan.

(3) JICA dispatched an expert and three volunteers from 1999 to 2003.



**Waste Compaction at the Landfill using Heavy Machinery  
Granted by the Government of Japan**

#### 2. Progress achieved

##### (1) Organizational development

Originally, the Cleansing Section in the Department of Construction, Transportation, Post and Communication of Vientiane city was in charge of SWM. In 1998, the Urban Cleansing Service (UCS) unit was formed as an institution dedicated to SWM in Vientiane Urban Development Administration Authority.

The number of staff increased from 67 in 1991 to 189 in 2003. Also, UCS became conscious of SWM institutionally, through continuous Japanese assistance for such activities as strengthening of fee collection, training in vehicle maintenance and the introduction of sanitary landfill practices.

##### (2) Development of collection service

Expansion of the collection service is the most successful point. The collection amount has increased dramatically since 1998, right after the grant aid. In terms of collection capacity, there were ten collection vehicles, both municipality and privately owned, in 1991, 24 units in 1998, and 30 units in 2003.

JICA provided support to establish a fee collection system to expand the collection service by conducting a collection experiment in the master plan study. The experiment included meetings with residents, bamboo basket discharge, bell and/or curbside collection, a

contract system between citizens and the authority, and an appropriate accounting system. For more about fee collection, refer to (3).

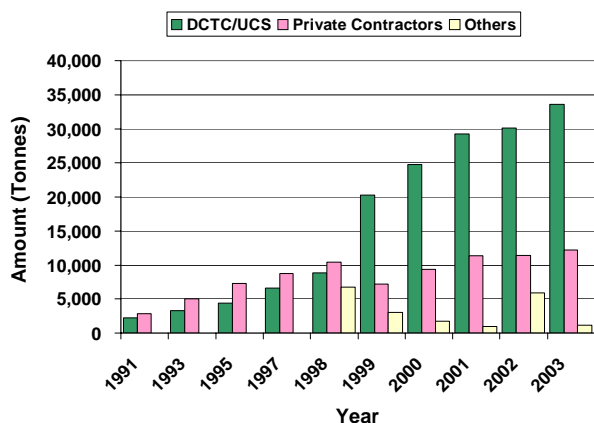


Fig. Annual Waste Collected/Disposed at Landfill Site KM18

(3) Financial development

With application of the “beneficiary-pays-principle”, the amount of fees collected has increased significantly.

Service contracts in villages where not all the households have access to the UCS’s collection service have been facilitated by the village offices. The village offices take responsibility for promoting the use of the service, creating manual customer databases, facilitating the execution of contracts and collecting fees. At the end of each month, the village offices collect fees from village customers and pass them onto the UCS finance office while retaining a 10% commission for their contribution. The fee for domestic waste is 1,500 kip/basket.

The UCS is, however, still under financial pressure and needs to rely on municipality budget. The municipality budget has been decreasing since 2000, which amplifies the UCS’s financial difficulties.

Table Finance of SWM in Vientiane

	1991	2000
Basic Fee	11.5	1,285
Tipping fee	0.4	33
Budget from Municipality	10.5	1,281
Total (Millions of kip)	22.4	2,599
Total (US Dollar)	31,550	331,082

Exchange rate: 710 kips/\$ in 1991, 7,850 kips/\$ in 2000.

(4) Improvement of maintenance

Through the provision of maintenance workshops and guidance by the JICA volunteers, UCS can handle most

of the vehicle breakdowns. As a result, all the collection vehicles granted by the Japanese government are still in good condition.

3. Remaining Issues

Despite such progress, the following issues still remain and the UCS is doing its best to overcome them.

(1) Legislative framework

There is no national legislative framework for SWM. The provincial decree on SWM was issued in Vientiane in 1999, but the emphasis of this decree is placed on road cleanliness rather than proper SWM and it is insufficient to improve SWM practices.

(2) Finance

The UCS is not fully financially sustainable. The UCS is not setting aside funds for future growth or replacement of facilities and equipment. Although the local currency depreciated to one-tenth its value this past decade, the fee rate has not been raised accordingly. Also, there is no activity based accounting, making it difficult to understand the real costs of service delivery.

(3) Management of landfill sites

The landfill was provided with adequate fuel and maintenance for machinery, as well as technical and managerial inputs for proper sanitary operation from 1998 to 2000. The present landfill is, however, nothing but an open dump. According to UCS, deterioration of the landfill status is due to the breakdown of bulldozers, which need engineers and parts from overseas.

Reference

Earth Systems Lao (2004), Follow-Up Survey on Assistance for Waste management (unpublished, submitted for the JICA study on the direction of cooperation in solid waste management in developing countries)

(Taisuke Watanabe)

**Journal of the Japan Society of Waste Management Experts, Vol. 15, No.4 (July 2004)**

Recent issues of the Journal of JSWME contain the following articles. The articles are written in Japanese with the abstract in English.

Paper

***Cost Effectiveness of PCB Waste Destruction Projects Using PCB Exposure as a Risk Index***

Yasuhiro Hirai and Shin-ichi Saka

***Manufacturing Process and Business Feasibility of Red Sea Bream Diet from Food Waste***

Yuki Ikeda, Yuzuru Ishizuka, Masakazu Irie, Toshinori Kameoka, Takashi Ishiwatari, Takahiko Suzuki and Yukio Matuda

***Modeling of the Collection System of Waste Paper based on Questionnaire Survey***

Akio Shimizu, Tohiya Aramaki and Keisuke Hanaki

***Analysis of Household Waste Reduction with the Introduction of a Transparent Garbage Bag System***

Masako Fukuoka, Harumi Koizumi, Hajime Yamakawa and Hiroshi Takatsuki

***The Effect of Garbage Separation Treatment on Municipal Waste Management***

Kiyotaka Tahara, Atsushi Inaba, Yu Sakane and Toshinori Kojima

***Fifteen-Year Experiment on Corrosion and Mercury Behavior of Dry Batteries in Landfill Lysimeters***

Ryuji Yanase, Fumiaki Hirano, Yasushi Matsufuji and Masataka Hanashima

***Effects of Short-term Exposure of Leachate to Medaka (Oryzias latipes)***

Makiko Doi, Kasuhiko Fukatsu, Ryota Shinohara, Masataka Hanashima, Sotarou Higuchi and Keijirou Tomoda

***Influence of Carbon Dioxide on Removal and Capture of Lead Ions by Molten Slag***

Yukio Fujita, Takayuki Shimaoka and Seizou Kenmoku

***A Survey on Consumer Disposal Behavior of Electric Home Appliances for Encouraging Products' Long-term Use and Reuse***

Tomohiro Tasaki, Atsushi Terazono and Yuichi Moriguchi

Note

***The Self-coating Structure of the Spiral Flow Melting Furnace in Gasification-melting System***

Hiroshi Fujita, Kenichi Fujii, Sadafumi Katoh, Masatoshi Hirokawa and Yuji Tada

**Waste Management Research**

**Vol. 15, No.4 (July 2004)**

Preface

***Past, Present and Future Changes at Dedicated Landfill Site***

Masataka Hanashima

Special Issues: Recycling and Resource Recovery of Inorganic Solid Wastes

***Foreward***

Hideaki Itoh

***Resource Recovery of Valuable and Hazardous Metals from Ceramic Scrap***

Ryo Sasaki and Hideaki Itoh

***Preparation of Glass-ceramics from Inorganic Wastes and Their Properties***

Kiyoshi Okada

***Hydrothermal Dynamics and Waste Treatment ---Recycling and Recovery of Inorganic Materials based on Earth Principle---***

Nakamichi Yamasaki

***Resource Recovery of Inorganic Waste ---Conversion into Environmental Purification Materials---***

Michihiro Miyake and Motohide Matsuda

***Hydrothermally Solidified Functional Materials from Inorganic Wastes***

Norifumi Isu and Hideki Ishida

***Chemical Conversion of Inorganic Waste Coal Ash into Artificial Zeolite and its Recycling as a Material for Life Environment***

Teruo Henmi

Report

***Report on the 2003 Fall Meeting of Waste-to-Energy Research and Technology (WTERT) Council in New York City***

Masato Nakamura

Current Members of JSWME As of 30 September 2004  
(Values in parenthesis are differences  
from 30 June 2004)

Regular Members	3,532	(41)
Students	300	(2)
Non-Japanese Member	90	(2)
Public Institutions	113	(0)
Supporting Members	179	(2)
Individuals of NPOs	3	(0)
Total	4,217	(47)

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