NEWSLETTER

No.78 *This Newsletter is a quarterly e-publication.* **October 2011**

JAPAN SOCIETY OF MATERIAL CYCLES AND WASTE MANAGEMENT

Contents

Strategy for disaster waste separation and treatment: Manual making by the society task team

Half a year has already passed since the March 11 tsunami. The disaster zone is being cleared of the enormous amount of waste—and its treatment is underway—at an amazingly fast rate. We, the task team, would be extremely pleased if our work has contributed in some measure.

Manual making by the society task team

One of the biggest works for "The Task force on Disaster Waste Management and Reconstruction" which was established in the Japan Society of Material Cycle and Waste Management on 18th of March, 2011 was to make a manual, "Strategy for disaster waste separation and treatment". The manual was released on the 4th of April, 2011. Version 2, which covers treatment and final disposal, was rereleased on the 30th of April, and minor corrections and revisions have been made twice since. The contents are shown below, while the background and work flow were outlined in the previous issue of this newsletter. A Japanese version of the manual has already been released on the website; the English version is currently being translated.

Structure of the manual

The contents of the manual are shown below. The manual places importance on practical use. It has a total of 104 pages; each chapter focuses on one aspect of waste treatment so as to match each individual need. There are other features designed for practical use, shown later.

Contents (as of 15th of June, 2011)

recycling law
【Chap.8-9】Other electric appliances
【Chap.8-10】Vehicles
【Chap.8-11】Motor bikes
【Chap.8-12】Boats and ships
【Chap.8-13】Asbestos
【Chap.8-14】Individual hazardous and dangerous products
【Chap.8-15】Valuables and keepsakes
【Chap.8-16】Others (to be added as needed)
【Chap.8-17】Night soil and household sewage (treatment of wastewater when treatment facilities have been damaged)
【Quick reference matrix of disaster waste】
【Reference information for dismantling vehicles (for business entities)】
【Dealing with asbestos 1~5】
【Reference】National guidelines on waste treatment for Great East Japan Earthquake

■Characteristics of the manual

Characteristics of the manual are as follows.

① Even though these are disaster waste, recyclable items are listed up to promote reuse and recycling as much as possible. The manual gives ways of separation and options for reuse and recycling.
② The manual outlines the most practical hazardous and toxic waste countermeasures.
③ The manual also includes photos to provide a visual image of good practices with regard to disaster waste management.

Because the disaster generated a multitude of waste, each type needs to be separated. Rubble (concrete and asphalt) and wood represent the largest volumes of waste. The waste has to be separated into non-recyclables and recyclables/reusables, while attention needs to be paid to each individual item. This will reduce accidents and risks associated with hazardous and toxic waste.

As for hazardous and toxic waste, the manual gives examples of separation and treatment flow after separation for maximum separation. Assuming that volunteers and non-experts are involved in the work, a quick reference guide to hazardous and toxic waste is attached.

Lastly, the manual includes photos as practical examples (mostly good practices) of this catastrophic earthquake. For example the figures below show the management of the first waste disposal site in Sendai City. Some municipalities have been delayed in dealing with the enormity of their problems. Therefore, it is expected that this manual will be of help as a reference moving forward.

■Being well prepared for a disaster

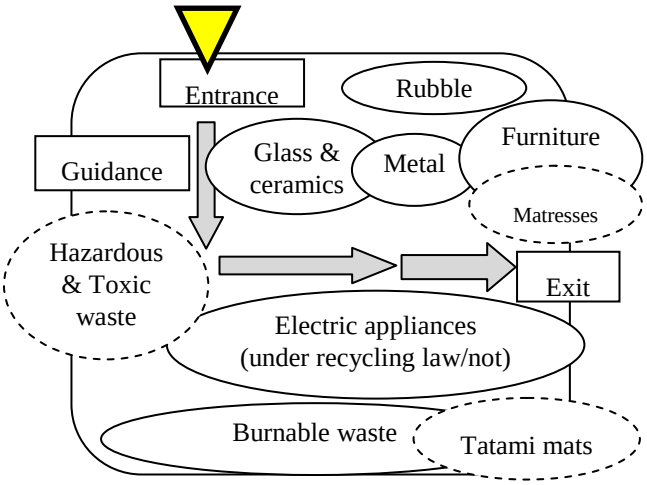
This manual and the experiences gained in the tsunami aftermath need to be utilized in future. All kinds of emergencies and natural disasters require preparation on a daily basis, such as basic knowledge, building the capacity of relevant organizations and ability to handle on-site issues. Many of municipalities have already started reviewing their level of preparedness. We would like to share our knowledge and experiences, not only domestically, but with other countries such as in Asia.

Entrance (Outside): Guiding traffic into the disposal site and controlling congestion

Entrance (Inside): Asking the type of waste and giving directions

※ Hazardous and toxic waste had not been separated at this site, even though it would be ideal.

Glass & ceramics, and rubble (concrete etc.) have been separated (pictures above and left)



Electric appliances under the law (TV, refrigerator, washing/drying machines, air conditioners) are separated.

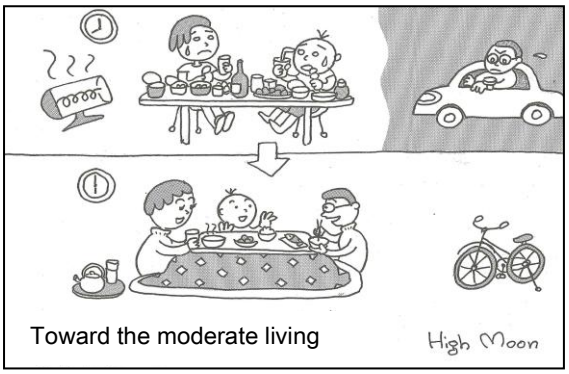
Metal waste is piled as shown above and motor bikes and bicycles were also stacked beside this.

Burnable waste: There were wood materials of collapsed houses, tatami mats and carpets.

Although the sign says "Sofa", furniture and mattresses were observed.

【 Figures 】 Good examples of waste separation and management at the first temporary waste disposal site to respond, at "Nipperia" ground in Sendai City. The presence of guides, in addition to relatively good waste separation and management in the form of a "Drive-thru" which is common in European countries and the US, were the keys to its success.

（Misuzu Asari）



Project for Improvement of Capacity on Solid Waste Management in Havana City, the Republic of Cuba

In Cuba, the Fidel Castro regime came into power after the Cuban Revolution in 1959. Economic sanctions by the US government have been imposed since then. The Cuban economy was deeply impacted by the collapse of the Soviet Union and Eastern Europe, and civil life has also been impacted, such as by poorly managed municipal waste.

Based on a request by the government of Cuba, JICA (Japan International Cooperation Agency) created a master plan, "the study on integrated management plan of municipal solid waste in Havana City" (2003-2006) to drastically improve waste management in Havana City.

Following the master plan, the government of Cuba closed most of its emergency disposal sites and procured collection vehicles. The government also requested a technical cooperation project of the Japanese government as it needed the technologies and knowledge of Japan to further improve its situation. A summary of the project is given in the table below; of which strengthening the capacity of waste collection and transport, especially improvement of collection vehicle maintenance is

outlined in this article.

Summary of JICA's technical cooperation project	
Project period	August, 2009 to March, 2013
Target area	Havana City (population: 2,200,000)
Counterpart institution	Provincial Direction of Communal Services in Havana City (DPSC)
Project purpose	Urban waste management capacity of DPSC will be strengthened through collaboration with partner organizations.
Summary of the project	1. Improvement of integrated waste management 2. Pilot project on reduction of organic waste disposed 3. Strengthening the capacity for waste collection and transport 4. Strengthening the capacity for designing and management of final disposal site
Inputs from Japanese side	Dispatch of experts, provision of equipment (collection vehicles and maintenance tools, machines related to composting etc.)

Havana City has compactor trucks from various countries (8 including China). Their maintenance equipments are too old for practical use, and it is very difficult to procure equipment and parts, meaning, for example, that any engine available is put into a different type of vehicle, just like the old American vehicles running in the city. Even under such circumstances, waste was collected daily thanks to the engineers' excellent maintenance techniques and regular management of the goods and parts.

The project is planning to improve the capacity of maintenance of collection vehicles and waste collection by providing equipment (for machine-tooling, maintenance and measurement etc.).

A list of the necessary equipment and layout design of it were made in fiscal year 2009, which was procured in 2010, and most equipment was delivered by June, 2011. Installation, trial running and instruction of use are being conducted at the moment (September, 2011). Necessary preparation for base, electricity and plumbing are to be covered by the Cuban side, and they are now renovating the lighting and roof.

There are several issues to be resolved, 1) the maintenance workers do not understand about oil pressure and electric circuitry of the vehicles, 2) there are no maintenance manuals, 3) all the maintenance works are totally dependant on their experience and feeling, 4) there is not enough checking up, and 5) there is limited use of tools to avoid theft and loss. The project is planning to introduce back-up maintenance and checking-up, more precise and efficient maintenance work and improvement of management of vehicle maintenance workshop. The main objective of the project is to strengthen the capacity of the counterparts and the Japanese experts are basically advisers to let them do the actual work and improvement by themselves.

Instructing how to install a fuel injection pump on a used Japanese compactor truck.

(Ryo Hiraga)

JICA's Comprehensive Solid Waste Management Seminar

The Comprehensive Solid Waste Management Seminar targeting management-level administrative personnel on solid waste management in developing countries has been training on Japan's experience, system and technical aspect of solid waste management.

This seminar was initiated in 1969, and has since been held annually for the last 43 years. Japan Environmental Sanitation Center (JESC) is contracted by JICA to hold, plan and manage the seminar. The seminar has been revised twice to make it more relevant to waste management needs at the time. Essentially, it covers the basics of waste management.

It was first revised in 1989, 21 years after the first training course. Before this, it mainly focused on removing waste from living spaces in a sanitary manner, efficient transportation, and sanitary final disposal. Moreover, planning of waste disposal/treatment, information management and concept of resource utilization were also added. 10 years after this, the content on resource utilization was further strengthened, hazardous waste management was added, and the name changed from the waste disposal seminar to comprehensive solid waste management seminar.

Table 1: Participants by region

	Waste disposal I 1969-1989	Waste disposal Ⅱ 1989-1999	Comprehensive solid waste management 1999-2011
Asia	137(15[1])	53(12)	57(16)
Oceania	1(1)	0(0)	14(5)
Latin America	48(12)	31(10)	24(9)
Middle East	19(10)	6(5)	15(5)
Africa	10(4)	14(7)	6(6)
Eastern Europe	0(0)	2(2)	1(1)
TOTAL	215(42)	106(36)	117(42)

A total of 438 trainees from 38 countries have participated in the course over the years, as shown in the table below. The majority of participants were from Asia for the waste disposal seminar (1969-1989), while there are more from Latin America, Oceania and Middle East in the comprehensive solid waste management seminar (1999-2011).

During the course, all of the trainees are required to make an action plan to be achieved within one or two years of returning to their countries. Action plans should build on the knowledge learned during the course as much as possible. Table 2 below shows the themes of action plans made by the trainees from 2004 to 2011. Landfilling, waste management plan, recycling, and collection & transport are popular issues among them. There was only one on intermediate treatment. This theme selection shows the issues the trainees are facing.

Table 2: Action plan themes

Theme	Number of participants
Landfilling	19
Waste management plan	14
Recycling	15
Collection & transport	15
Public participation/ Environmental education	9
Hazardous waste management	5
Intermediate treatment	1
Others (Regulations)	1

Waste separation and recycling are generally institutionally conducted in the society and properly managed in many developed countries. In developing countries, however, these are dictated by economic principles—such as unprofitable items not being recycled—and as a result are often improperly managed. Japan also has a negative legacy of waste management. A representative example is the extensive illegal dumping in Teshima, Kagawa Prefecture more than 20 years ago. However reform over the following 10 years transformed Japan into a recycling leader. These valuable experiences are worth disseminating to others through this seminar.

（Takashi Miyagawa）

New methodology of CDM, "Avoidance of landfill gas emissions by passive (semi-aerobic) aeration of landfills" was officially approved by UNFCCC of the United Nations

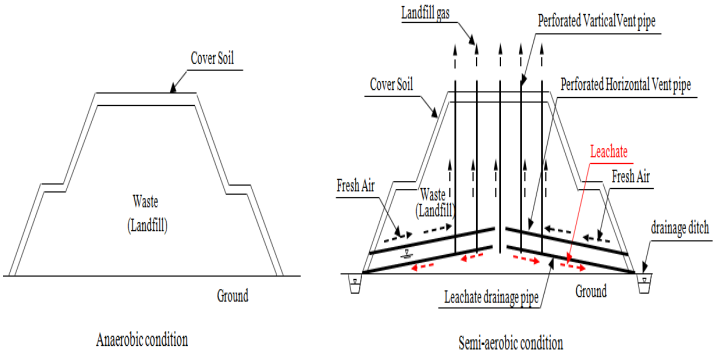
A new clean development mechanism (CDM) methodology, "Avoidance of landfill gas emissions by passive (semi-aerobic) aeration of landfills" which was developed by Fukuoka City and Fukuoka University (Hydraulic Sanitary Engineering Lab. of Engineering faculty) was submitted to the United Nations by Tokyu

[1] Bracketed figures represent the number of countries.

Construction Company Limited supported by National Institute for Environmental Studies on 15th July, 2011, and subsequently received official approval (No. of the new methodology AM0093).

This methodology applies to project activities that treat landfilled waste on-site (anaerobic landfill)—popular in developing countries—by means of passive (semi-aerobic) aeration. This is done by installing aeration and drainage pipes with the objective of avoiding anaerobic degradation processes and achieving aerobic degradation. By aerating the landfilled waste, landfill gas emissions such as methane gas are decreased, the quality of leachate is improved and bad odour is reduced.

Ventilation equipment generally consists of vertical perforated pipes and horizontal perforated pipes at anaerobic landfills. Leachate drainage pipes are also set to keep the internal-water level low (see the figure below). Air is naturally introduced into the landfill without mechanical injection, through convection caused by temperature differences. This improves the condition in the waste layers and reduces emissions of methane gas by avoiding anaerobic conditions.



There are other methodologies to reduce methane gas from landfills, such as generating electricity or incinerating collected gas, and are approved by the United Nations. These methodologies however do not reduce generation of methane gas itself and keep the condition of the landfill site anaerobic.

On the other hand, this methodology directly reduces the amount of methane gas generated by converting from anaerobic to passive (semi-aerobic) conditions. This is totally different from the concept and methodologies of generating electricity, and it is an original landfilling technology of Japan. This methodology also reduces bad odour and improves leachate quality, thereby improving the surrounding environment. And because it is an easily applicable and low-cost technology, the condition of the landfill can be rapidly stabilized, reducing the period of maintenance and management, which is suitable to the actual situation of the landfills in developing countries.

This methodology is in line with Co-benefit* CDM projects, which are beneficial to the environment and promoted by the Ministry of Environment of Japan. This methodology is a viable option in improving the many anaerobic landfill sites in developing countries.

**Co-benefits Approach*
*The **Co-benefits Approach** means integrated efforts to address climate change mitigation concerns, while meeting development needs in developing countries.*
*The **Co-benefits Approach** helps developing countries increase their ownership while engaging in efforts to address climate change, by introducing measures to achieve tangible development benefits.*

（Chuichi Ueno and Masato Yamada）

Conference Information

JSMCWM International Symposium
Mercury Management in Solid Waste Sector
Nov. 3, 2011 in Toyo University, Tokyo, Japan

Material Cycles and Waste Management Research Vol. 22, No.3 (May, 2011)

Sharing of Bicycle Rental Project by Local Government
Yachiyo Nakai

Promoting Sustainable Cities through Bicycle Use
Shigeki Kobayashi

Returbichment of Abandoned Bicycles
Kiyoshi Fujii

Using Bicycles for Courier Services: A Case with Ecohai, Co,. Ltd.
Tsuyoshi Futamura

Life Cycle Assessment of CO2 Emissions from Intra-urban Transport Modes: Evaluation of Environmental Friendliness of Bicycles
Hirokazu Kato, Michihiro Yamamoto and Naoki Shibahara

Promoting Greater Use of Public Transport through Rent-a-bicycle System: A Case Study Conducted in the Katsurazaka Area of Kyoto
Shinya Yano, Kenji Ijiri, Seishi Nagata, Haruna Suzuki and Satoshi Fujii

Electric Power-Assisted Cycles: Trends and Possibilities
Shino Ota

Symposium Report

Report on the 2010 Symposium of JSMCWM: To Reuse from Recycle

Activity Reports from the Regional Chapters

Report on the Lecture Meeting of the Tohoku Region Chapter

Report on the Meeting of the Tokai-Hokuritku Region Chapter

Report on Activity of Tokai-Hokuriku Region Chapter

Journal of the Japan Society of Material Cycles and Waste Management Vol. 22, No.3 (May, 2011)

Paper

Effects of Industrial Waste Taxation: Panel Data Analysis of Industrial Waste Generation in Japan
Toshiaki Sasao

Environmental Load Assessment for Recycled Products: Effect of Greenhouse Gas Reducgtion Intended for Construction Materials
Takashi Saeki, Naohisa Yamaguchi and Masahiro Osako

Development of Dechlorination Technology for the Liquefaction Recycling of Municipal Waste Plastics
Masaaki Fukushima, Hidetoshi Ibe, Keiji Wakai, Eiichi Sugiyama, Hironobu Abe, Beili Wu, Kiyohiko Kitagawa, Shigenori Tsuruga, Katsumi Shimura and Eiichi Ono

Study of Capillary Barriers that Use Industrial Byproducts
Atsushi Sakamoto, Makoto Nishigaki and Suehiko Yokota

A Study on the Recycling of Food Wastes by Carbonization: Physical and Chemical Characteristics of Food Wastes
Ryo Onishi, Maya Kamiyama, Kenichi Nonogaki, Hiroshi Fukuda, Kouichi Nakahara, Takaaki Higashino and Hideo Ikeda

Problem-Solving among Stakeholders in the Plastic Containers and Packagin Recycling System: Application of Life Cycle Assessment
Jun Nakatani, Kana Suzuki and Masahiko Hirao

Note

Pyrolysis Characteristics of Food Wastes
Yoshihiko Wada, Yukimasa Norose, Kazunori Iwabuchi and Katsumori Taniguro

Current Members of JSMCWM as of September 30, 2011	
Regular Members	2,590
Fellow	27
Senior	7
Honorary member	7
Students	306
Public Institutions	91
Supporting companies	125
NPOs	6
Individual	5
Total	3,164

NEWSLETTER NO.78, October, 2011
Published by: Prof. Shin-ichi Sakai, President,
Japan Society of Material Cycle and Waste Management
Edited by: Prof. Hidetoshi Kitawaki, Chairman,
International Relations Committee
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