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**Greetings from vice-president of JSMCWM**



Since the 2011 Great East Japan earthquake, tsunami and nuclear disaster I feel that people's trust in science has waned. What followed was an appalling state of affairs, such as the cover-ups of the government and Tokyo

Electric Power Company (TEPCO, the operator of the Fukushima nuclear plants that went into meltdown), the scientifically unsupported appeals of safety by scientists on television, power companies' claims that a government panel's recognition of seismic fault lines (running under nuclear plants) being active as unscientific, arguments for restarting nuclear power plants in the name of economic growth, and not to mention continued selling of Japanese nuclear power expertise overseas. There always was a tendency in Japan for the economy to be prioritized over an under-esteemed science, however, on this occasion everything came into the open at once. Now of all times our society, a receptor of knowledge, must take this chance to make itself known.

What is a society? Generally it should be a place where a group of experts from a particular field can heighten their expertise. Of course, research for the furtherance of science is also important. In the case of waste management however, there remain so many societal issues that need resolving, which I feel constitutes the most important mission of our society. Waste management issues can at times become

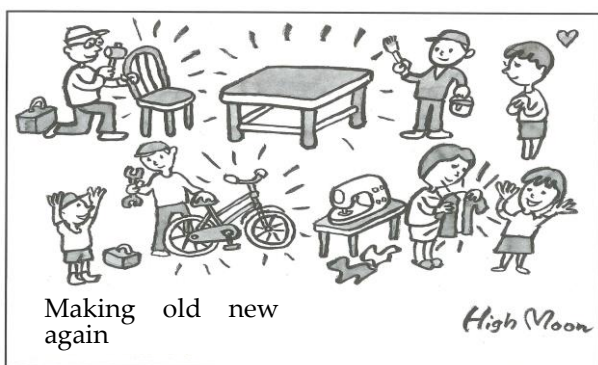
political and societal issues. Nevertheless, society needs the results of scientific research into waste management. While individual effort has its limits, a society must make a contribution to such issues.

Our society has over ten research groups. So far the seminars and activities of each research group have been held at society meetings and so on. From this year on we will focus more on symposiums for the general public and other non-society groups. Considering the complexity of waste management issues, it would be best to hold such events jointly among several research groups. What we must consider is how best to convey complex and technical subjects and proposals to the general public. Moreover, we should aim for our work to be published in general publications. Our society has published many works in detailed technical articles; however, these are all overly technical. The matter of land reclamation using waste for example, is an important research theme, however, there are no books on this argument. Because this kind of "theory" is not widely known is why inappropriate disposal is so common. Compiling one's knowledge in easy to understand language in a publication is of great importance to society as a whole.

I want to increase our involvement in national and local government policy making as one of our activities of social responsibility. Our society accumulates masses of information and knowledge as a result of discussions at committee meetings and commissions; however, we only present these results. We need to bring such information to public attention and not just keep it to ourselves. Currently the society is working to publicize exactly what kind of experts we have amongst our members, so that the public can search for an expert. The aim of this is to make a public appeal that we are a society of experts and to provide local authorities and civic organizations with information through the "society" to introduce experts as they require. We believe this is an effective method of strengthening our links to society.

Going further, is it possible for us to make proposals on the structure of waste management itself. In Japan research begins after a law has been passed. In the EU there is a major difference in how researchers study the contents of a law. In the field in waste management it is extremely common for laws to become an obstruction. Often this results in the intended purpose being forgotten for sake of not breaking the law. I want this society to lead the way by showing how waste management should be (policy direction) based on scientific evidence.

(Toshihiko Matsutou)



With a bit of effort most "waste" can be given a new lease on life.

**Diagnostic report on SWM in Nepal: Key issues, challenges and way forward**

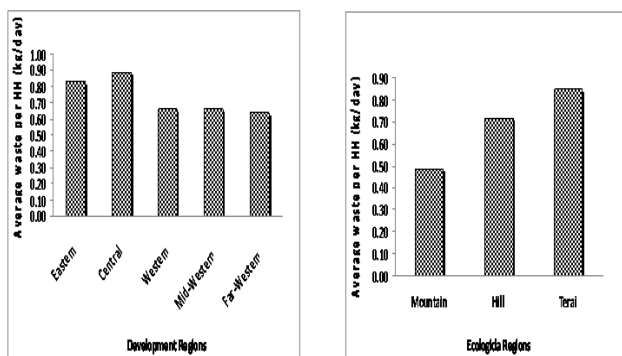
Similar to other least developed countries, little effort has been seen in research on issues of solid waste management (SWM) in Nepal. The immediate reason behind this is the low priority given to engineered facilities for solid waste collection, transportation and disposal activities. As for this, little is known about the actual state of SWM in urban areas in general and municipal areas in particular. The overall outcome that emerges from the sporadic studies/research on such issues in Nepal is endowed with several uncertainties and grey areas which are of little help to ascertain the actual situation and develop a long term strategy. In these contexts, a study was conducted to establish certain urban SWM perspectives within municipalities through qualitative and quantitative surveys, interviews, and data collection from 58 existing municipalities in Nepal with 70 highly qualified and trained researchers. This article introduces the analysis of these survey results with realistic explanations that in the past used to complicate and sometimes even challenge widely held

assumptions about SWM at the national level.

**Background information: Waste generation and collection**

The total sample size of 3,233 households from 58 municipalities, varying from a minimum of 50 HHs to 220 HHs accounted for an average per capita waste generation figure of 0.16 kg per capita per day. Similarly, the average HH waste generation was found as 0.8 kg/day. Fig. 1 shows the variation of generation rates in different regions.

The study carried out in 2004 indicated that the total waste generation of 58 municipalities of Nepal was 1,369 tons/day with the per capita waste generation of 0.25 kg/person/day. Further, the municipal authorities collected only 42% (average of 58 municipalities) of total solid waste generated in urban areas. This study showed that the total waste collected in 58 municipalities was 1283 tons/day. With an assumption of linear growth, it can be concluded that the average annual growth of municipal waste collection is 15 %. The variation of the waste collection data as per the two types of regions under consideration is shown in Fig. 1. The least collection was recorded at Dhulikhel (1.89 tons/day) and the highest one was recorded at Kathmandu (467.8 tons). It is obvious to note that the institutional share of the waste is highest in the Kathmandu Valley which is clearly reflected by the figures of central development region and mountainous regions. The lowest share of commercial and institutional components was found in Gorkha (5.63 %) and the highest value was found in Kapilbastu (55.37 %). Such drastic variations on the two non-household components are due to the higher share of the rural areas where there is relatively less commercial and institutional facilities.



by development region

by ecological region

Fig. 1: Average household waste generation

## Waste characteristics

Physical analysis of the waste samples collected from the households during the survey was carried out to determine the composition of waste. The average values for different waste in terms of percentage composition by wet weight were obtained. Average physical composition in the municipalities revealed seven categories which were: organic waste, plastics, paper and paper products, glass, metals and textiles. The analysis of waste composition indicated that the highest proportion of waste was organic matter (65%) followed by plastics (11%). Paper and paper products and others comprised 9% and 7 % of the waste respectively. Glass, metal, rubber and leather, textile components were either at or below 3 %. Similar to other developing countries, the solid waste in the subject municipalities has high organic content. Recyclable materials like paper, glass, metal and plastic contents, account for less than 11%. It is remarkable that some of the municipalities were found to reuse most of the kitchen waste generated for different purposes, e.g. feeding the pigs, pigeons and cattle thus resulting in lower waste generation rates.

## Solid waste disposal

Effective and efficient solid waste management approach was almost non-existent in practice in majority of the municipalities. Current waste disposal practices included dumping either in the open or at poorly engineered disposal sites. Due to lack of human and financial resources, and political instability, it has also been a challenge to operate and maintain disposal sites at minimum sanitary standards.

Many municipalities are yet to find the sites for construction of treatment facilities and sanitary landfill sites. Moreover untreated waste at crude dumping sites causes health and environmental problems. Several municipalities do not even own land for construction of future landfill sites. There is an urgent need to identify and allocate suitable land for setting up treatment and disposal facilities. The disposal sites in most of the municipalities are mainly riverbanks, low-lying land/dumps, open pits or temporary open piles.

## Challenges and future prospects

As discussed in previous chapters, the municipalities of Nepal are facing many complications and difficulties to achieve their solid waste management goals. In recent years, management problems are

becoming complicated and their magnitudes have increased many fold. The haphazard disposal of solid waste in densely populated areas, environmentally sensitive areas, riverbanks and heritage sites has adversely impacted public health and surroundings which put a negative externality in anticipated improvement on the quality of life of people. There are problems at both management and implementation levels. Most common and frequently cited problems of solid waste management in the municipalities are listed in Box 1:

### Box 1: Challenges of SWM in Nepal

- No separate bodies/departments responsible for Solid Waste Management
- Lack of equipment and technical manpower, and capacity building activities
- Lack of empirical evidences and research based data and statistical records as well as awareness and information and strategic planning
- Inadequate budget;
- Little or no public-private participation; and
- Political intervention.

## Conclusion and recommendations

Current waste disposal practices included either open dumping or at poorly engineered disposal sites. Due to the lack of human and financial resources, and political instability, it has been a challenge to operate and maintain disposal sites at minimum sanitary standards. The municipalities hitherto do not have sufficient resources to solve the problems, hence municipalities need some assistance and support from leading centers. Such help includes both hard and soft measures.

(Surya Man Shakya, Nawa Raj Khatiwada, and Alpha Thapa)

(This article was edited by JSMCWM editors. Original paper “Diagnostic report on SWM in Nepal: Key issues, challenges and way forward” is available upon request from the editor. Please contact [t-matsumoto@cpjip.com](mailto:t-matsumoto@cpjip.com).)

## Home appliance recycling in China

A summary of JSMCWM’s official visit to China from March 12 to 16, 2013 was included in the previous issue, No.83. In this text an overview of home appliance recycling in China is introduced to give readers a better understanding of the visit.

In China the Home Appliance Recycling Law was

enforced in January 2011; before this came into force there was a trial collection of used home appliances, the Home Appliance Replacement Initiative. During the trial from June 2010 to March 2011 a subsidy was paid to purchasers (i.e. recycling companies) of used home appliances with the aim of boosting the economy by providing a financial incentive for the collection of used appliances. Many recyclers participated in the trial collection initiative in anticipation of the Home Appliance Recycling Law.

The biggest difference between the Japanese Home Appliance Law and the Chinese one is as follows. In China recyclers buy the old home appliances from dischargers; recyclers do their businesses with governmental subsidies and the profits they can earn by selling the recycled valuable materials such as copper, aluminum, iron and plastics from appliances.

In Japan the other hand, all dischargers pay a recycling fee before they can discharge their home appliance. The difference between China and Japan is shown the next tables.

		China	Japan
<b>Enforcement</b>		January, 2011	April, 2001
		Gradual rollout starting in certain major cities	Started all at once in the whole country
<b>used home appliances</b>		purchased by recyclers	waste
<b>Who pays?</b>		producers	Consumers
		Producers and importers of EEE must pay fees for the products to the "specialized fund" for e-waste treatment when they put on the Chinese market. The fees will be allocated to licensed recyclers as subsidies.	Consumers pay recycling fees when they discharge the post-consumer used home appliances.
<b>Licensing</b>	<b>Applicant</b>	Each recycling factory	Manufactures (Manufactures apply the whole system of recycling)
	<b>Clearing authority</b>	The municipal chief environmental protection section	Ministry of Environment, Ministry of Economy, Trade and Industry
<b>Items</b>		5 items	4 items
		Airconditioners, TV sets, Refrigerator, Washing machines, PC	Airconditioners, TV sets, Refrigerator, Washing machines

Table 1: Major differences between Chinese and Japanese recycling laws

Category	Item	Chinese Yuan/unit	
		Purchase price	Subsidy
Television sets	black-and-white 12, 14	69	85
	black-and-white 17	69	
	color 14	69	
	color 17	69	
	color 21	78	
	color 25	93	
	color 29	103	
Personal computers	CRT	126	85
	Liquid crystal	106	
Refrigerators	under 120L	90	80
	120-220L	140	
	over 220L	200	
Washing machines	small	40	35
	twin tub	70	
	automatic	80	
	drum type	100	
Air conditioners	window type conditioners	110	35
	sprit type air conditioners	190	
	room airconditioners	400	

Table 2: Purchase price and subsidies

Note: The purchase price is changed according to the market price.

From the viewpoint of Japanese enterprises in China the following are the most critical issues in the home appliance recycling system.

#### 1) Non-payment of subsidies

In China it is promised that subsidies will be paid to recyclers for the number of recycled home appliances. Yet, the first payment for the third and fourth quarters of 2012FY has not yet been paid. There are various imaginable causes, however the following are assumed to be the two main causes. Firstly, there is no common auditing standard of recyclers and processors by Ministry of the Environment Protection that covers the whole country. Therefore, there is a range of interpretations of these new standards according to the municipality. A common standard, however, has been established in April 2013; in the near future the auditing is going to be done well following the same standard. Secondly, there is a problem with the unlawful receipt of subsidies. As in the Home Appliance Replacement Initiative there were many unlawful applications and receipts, after the enforcement of the Home Appliance Law the process of subsidy payment became stricter. These problems made recyclers' business difficult, especially from a financial perspective, namely a lack of capital.

## 2) High price of recycled items

The purchasing price is decided in the post-consumer used home appliances market which started before the law enforcement; nowadays, it is more expensive reflecting the subsidies. It is approximately two times compared to the price during the trial period of Home Appliance Replacement Initiative. One reason is the existence of individual and small and medium sized collectors, who number more than 3 million. As under the Chinese Home Appliance Law collectors do not require official licenses, anybody can collect post-consumer used home appliances. Sometimes the items they collect are not treated in the formal sector. Under these circumstances an unbalanced supply and demand is a serious issue. Recyclers who were aiming to increase their economies of scale allowed a jump in purchasing price. The Chinese government regretted this and presented recyclers with a plan to control soaring prices by requiring them to adhere to appropriate volumes of recycled items. Currently, a license system of collectors is under discussion, and at the earliest this will come into effect next year. This is widely recognized as being a step towards creating a proper market.

## 3) Need to rationalize resource recycling market

There are many problems peculiar to China: vague understanding of laws, and local governments making their own judgments. For example, as strict evidence was not demanded at the collection or treatment, PC monitors were counted as TV sets. Another example is as follows: as there is no requirement to separate Cathode-ray tubes (CRT) in black and white TV sets, many more than the actual number of black and white TV sets is reported to be treated in order to avoid the CRT separation process. These unlawful practices will be reduced after tightening audits by the environmental protection authorities. However, it would take longer time to make the market rationalized if recycling business's consciousness has not been changed.

As shown above, there are big differences between the Chinese and Japanese systems.

The Chinese government evaluates environment and energy businesses as areas of national growth; the key to successfully overcoming these challenges and achieving growth seems to depend on the consciousness change of the Chinese people.

(Susumu Yoshida and Teruki Watanabe)

## Criteria for exported secondhand electric and electronic equipment (EEE)

Many end-of-life electrical and electronic equipment (EEE) has been exported from developed countries to developing countries for reuse and recycling purposes. These concerns have been increasing internationally in recent years. The Basel Convention that entered into force in 1992 strictly restricts the export of hazardous wastes, and requests exporting countries to gain prior notification and consent from importing countries. The Convention targets "waste electrical and electronic assemblies or scrap" containing hazardous components in its list of A1180, while the "electrical and electronic assemblies" destined for direct reuse is listed in B1110 as the waste not covered by the Convention. Since the Convention also defines the disposal of waste as the operations which do not lead to direct re-use, the trade of secondhand EEE are considered not subject to the Convention. However, illegal or illicit trade of waste EEE might be implemented under the name of secondhand EEE and many cases have been reported by academia, NGOs and mass media [1]. Since inappropriate primitive handling of printed circuit boards and various parts cause environmental pollution, how to distinguish secondhand EEE and waste EEE and how to prevent illegal trade are currently important issues.

Japanese government has ratified the Basel Convention and enacted domestic Basel Law for hazardous waste. Waste Management Law regulates that the exportation of solid wastes should be banned without confirmation of Minister of the Environment. Ministry of the Environment (MOE) and Ministry of Economy, Trade and Industry (METI) carry out the consultation service for exporters prior to exportation of secondhand products and recyclable resources as to whether the cargos are subject to those laws. In addition, some supplemental guideline and related notification have been already announced for preventing illegal export of secondhand EEE from Japan. Guideline A in the report titled "Guideline for distinguishing reuse and recycling of specified home appliances for retailers" (Sep. 2008) indicated that EEE with poor marketability and/or rough handling should be regarded not as secondhand EEE but as waste. MOE delivered the Notification (Mar. 2013, so-called 3.19 Notification) to municipalities that assesses end-of-life EEE whether waste or non-waste and waste EEE should be distinguished

comprehensively considering its characteristics, discharging situation, value, occupant's will and other and referring to the above guideline [2]. More concrete criteria were applied for secondhand CRT TV by METI and MOE in September 2009 [3]. Under this criteria, various details need to be confirmed, namely that a product is less than 15 years since manufacture, appearance, working condition (through burn-in test), packaging condition and retailers in the importing country. In addition, MOE implements campaign for prevention and monitoring of illegal trade of waste every year, as shown in Figure 1. [4]

MOE has started discussions on how to prevent illegal trade of every type of secondhand EEE as well as CRT TV, and has launched review meetings with academia since 2011. MOE made a Draft Criteria for exported secondhand EEE that requires appearance, working condition with burn-in test, packaging condition, confirmation of retailers at importing country, sales contract and existence of secondhand market in importing country, similarly to the criteria of CRT TV. MOE released it in June 2012 for public comments for one month and 453 comments were submitted in total [5][6]. Of the total comments, over 350 were objections or negative comments to the draft. Specifically, over 240 objections to the burn-in test were submitted, commenting that repair or recondition is operated in importing countries and that burn-in test will impose heavy burden in exporting business. With those many comments, finalization of the criteria was extended last year.

At Conference of the Parties (COP) and Open-Ended Working Group of the Basel Convention, "Draft technical guidelines on transboundary movement of e-waste and used electrical and electronic equipment, in particular regarding the distinction between waste and non-waste under the Basel Convention" (hereafter, Draft e-waste guideline) has been discussed, referring to the associated guidelines such as Partnership for Action on Computing Equipment (PACE) and Mobile Phone Partnership Initiative (MPPI) [7]. With regard to functionality, Draft e-waste guideline requires the certificate of testing to ensure equipment is "fully functional" when the exporters claim that an item is intended for direct reuse as secondhand EEE. The idea of this functionality test is considered to encompass not only electricity by burn-in test but also any workability. In this sense, this Draft e-waste guideline must be stricter than Japanese draft criteria in review.

At COP11 held in May 2013, the Draft e-waste guideline was not adopted and suspended to COP12 in 2015.

As many objections were submitted for public comment in Japan, extra or meaningless requirements would not be needed, as long as the secondhand EEE is appropriately reused in importing countries. On the other hand, we should recognize that increasingly stricter guidelines and regulations will be introduced internationally in order to prevent illegal or illicit trade of secondhand EEE. For future discussion in Japan as well as the Convention, how to harmonize those ideas and how the concrete functionality test or alternatives is set would be most important points.



Figure 1. Burn-in test of CRT TV under the campaign for prevention and monitoring of illegal trade by MOE [4]

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(Atsushi Terazono)

**The 17<sup>th</sup> Korea-Japan Joint International Session “Korea-Japan International Symposium”** hosted by KSWM was held on May 9, 2013. Details will be reported in the next issue.

#### Upcoming events

##### JSMCWM annual meeting (Sapporo)

Date: 2013/11/2-4

Venue: Hokkaido University

URL: <http://jsmcwm.or.jp/taikai2013/>

##### The 3R International Conference on Material Cycles and Waste Management (3R International) and the 13th Expert Meeting on Solid Waste Management in Asia and Pacific Islands (SWAPI)

Date: 2014/3/10-12

Venue: Kyoto University (Clock Tower Centennial Hall)

URL:

[http://3ri-2014.org/?utm\\_source=GPWM&utm\\_campaign=6a6f142813-GPWM+newsletter+March+2013&utm\\_medium=email&utm\\_term=0\\_43d987526e-6a6f142813-65534881](http://3ri-2014.org/?utm_source=GPWM&utm_campaign=6a6f142813-GPWM+newsletter+March+2013&utm_medium=email&utm_term=0_43d987526e-6a6f142813-65534881)

#### Material Cycles and Waste Management Research Vol.24, No.3 (May, 2013)

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#### Journal of the Japan Society of Material Cycles and Waste Management Vol. 24, No.3 (May, 2013)

##### Paper

*Gas Emission Control by Remediation of a Mountain of Inappropriate Waste Disposal*

Masanao Nagamori, Yugo Isobe and Yoichi Watanabe

*Analysis on Resident Consciousness and Behaviors regarding Source Separation for Aerosol Cans and Gas Cartridges*

Ryoko Sugiyama and Shu Yamada

*Lead Stabilization Mechanisms of AlPO<sub>4</sub> Prepared from Waste Acid Etchant in Municipal Solid Waste Incineration Fly Ash*

Katsuya Kaikake, Tomoo Sekito, Michito Tsunomori and Yutaka Dote

#### Current Members of JSMCWM as of June 30, 2013

Regular Members	2,280
Fellow	36
Senior	22
Honorary member	4
Students	192
Public Institutions	87
Supporting companies	117
NPOs	5
Individual	13
Total	2,756

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