

Technical Cooperation Project for Strengthening the Capacity for Solid Waste Management in Ulaanbaatar City in Mongolia

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1. Results of the Separate Collection in SBD7

Pilot project on separate collection was conducted in SBD 7 and we would like to explain its results!

The separate collection was conducted 8 weeks throughout the project under the following conditions;

- Collection time: from 9:00 – 11:30 am on every Tuesday
- Duration: 17 May to 5 July, 2011 (50 days)
- Target items: RPF materials and valuables
- Target apartment: 9-story apartments (38 entrances) with closed DC

The result shows that the total amount of collected waste is 5,363.2kgs of target waste and its average is 670.4kgs/trip. The amount of the target items increased gradually along with each time of the separate collection towards the end.

As the DCs in the apartments had been closed, residents discharged their waste at the side of DC trays and watchmen carried waste down to the storage rooms of DCs.

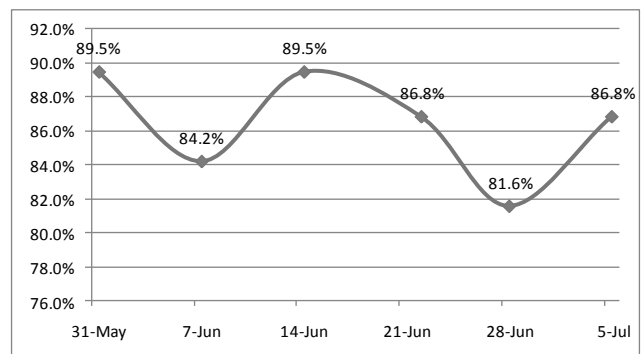


The watchmen played the important role in separation and putting target wastes in front of their entrance before the collection truck comes.



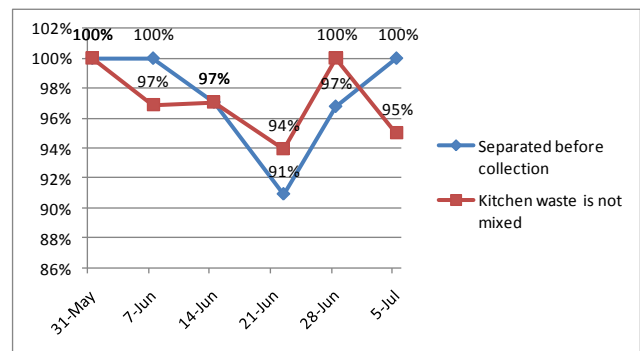
The following figure shows that the shares of the entrances covered by the separate collection on each collection day. Some of the watchmen discharged all their waste together with the regular

collection as it did not require separation of waste.



However, the result shows that the share of the collected entrance was 86.4% on average, so the degree of cooperation by watchmen/AOUs is considered high.

The conditions of waste discharging at the time of collection were evaluated with 2 criteria – the timing of waste separation (whether waste was separated before the arrival of truck or not) and the composition of the separated waste (whether kitchen waste is mixed or not).



The result shows that the both average rates are quite high (more than 95%) so the degree of cooperation in waste discharging by watchmen is considered very high.

Throughout the PP, the total trip number of the regular mix collection in SBD7 was supposed to be 112 trips if without PP, but actual regular collection was conducted only 101 times (excluding 8 trips of separate collection). Therefore, 3 trips decreased from the “without PP case”. One of the reasons is that cardboard was collected and transported separately, compaction efficiency of regular mix collection was improved.

Therefore, it can be said that the separate collection may improve regular waste collection efficiency and may not require additional cost for transportation judging from PP results.

2. Results of Sorting Experiment in NEDS

In order to recommend the most appropriate waste separation and recycling system for the UB city, the sorting experiment was conducted in NEDS under the following conditions; .

- Types of waste: 1) separated waste collected from SBD7, and 2) randomly selected waste collected from regular mix collection.
- Sorting method: 1) manual sorting, and 2) belt conveyor sorting for above 2 types of wastes by employing about 20 WPs.
- Period of sorting operation:

	Mixed Waste	Separated Waste
Manual sorting	July 27 to August 2, 2010	May 17 to July 5, 2011, Once in 2 weeks
Belt conveyor sorting	April 20 to April 28, 2011	May 17 to July 5, 2011, Once in 2 weeks

The above-mentioned 4 types of scenarios were analyzed and compared in terms of technical feasibility, operation cost, social consideration, and efficiency of separation, and working environment.

The results are to be used to examine the feasibility of KOICA’s RPF plant, which had been already constructed in November, 2011.



The following table shows the composition of wastes sorted by each type of scenario.

Item	Mix Collection		Separate Collection	
	Hand	Conveyor	Hand	Conveyor
Valuables	9.5%	10.7%	52.0%	47.5%
RPF Total	2.9%	5.8%	26.9%	30.4%
Residue	87.6%	83.4%	21.1%	22.1%
Total	100.0%	100.0%	100.0%	100.0%

The table shows that the biggest difference among 4 types of scenarios is the amount of residue, which shows over 80 % for mix collection waste and 20% for separated collection waste.



The amount of valuables shows about 10% is for mix collection waste and about 50 % is for separate collection waste. The amounts of RPF materials are 2.9%, 5.8%, 26.9%, 30.4% shown in the table from left to right. Therefore, technically speaking, separate collection is more desirable than mix collection and belt conveyor sorting is more desirable than hand sorting in terms of collecting RPF materials.

The following table shows that the cost analysis under 7 hours of sorting operation.

Description (MNT/day)	Mix Collection		Separate Collection	
	Hand	Conveyor	Hand	Conveyor
Sorting	305,083	214,872	274,039	260,432
Income	101,527	89,973	374,334	302,641

In terms of sorting cost, conveyor sorting with mix collection is most economical, but in terms of income from selling valuables, such as PET, glass, can etc., sorting with separate collection is more desirable.

When it comes to think of the working environment of waste pickers, the separate collection is much better than mix collection in terms of sanitation and safety.

3. Interview with Ms. Chantsalnurmaa of EPWMD on JICA's Japan-Training

Please introduce yourself.

My name is Chantsalnurmaa. I work as an officer in charge of soil and water pollution, medical and hazardous wastes at Environment Pollution and Waste Management Department of Mayor’s Office.

What kind of international training course organized by JICA did you take part?

I was enrolled in the training course entitled “Waste Management and 3R (Reduce, Reuse and Recycle) Policies” organized by JICA at “Tokyo International Center” in Tokyo, Japan from June 12 to July 14, 2011.



Please share with us your thoughts after being enrolled in that training course.

This training was an international training course, thus all classes were taught in English. I studied with 12 representatives from 7 countries. The main purpose of JICA was to enhance the capacity of government officials of developing countries, to share the Japanese experiences with them and to introduce up-to-date technologies and techniques by visiting the Japanese industrial plants and facilities on-site.

During the training course, we visited waste recycling facilities located nearby Tokyo. Also, we have been introduced to operations of final disposal site and its landfill technology, waste incineration plant and its electricity production, electronic, construction and car waste recycling facilities as well as medical waste treatment facility.



As a result of enrollment in this training course, I have realized the importance of waste recycling for society and economy on a whole as well as its environment friendliness. Also, I have learned that waste is no longer considered as waste, it is resources that can be used, and as like saying “better see it once than hear thousand times” I have observed and learned a lot by participation in the training course.

What are your plans to realize what you have learned in Japan?

Of course, there are economic and technical hurdles to implement directly the Japanese experience here in Mongolia. At first, I think it would be worth working on changing the current attitude of people towards waste. Thus, I am planning to work with khoroo governments and residents of the district that I am responsible for.

4. Workshop on Formulation of M/P for Provincial Cities

MONET has ordered every Provincial Center to formulate Master Plan on SWM and allocated certain amount of money to implement the plan. But many Provincial centers has difficulty in formulating M/P since there is no such experience before.



Workshop on formulation of M/P for Provincial center was held from Jun 28 to 30, 2011 in UBC. 18 Officers and Directors of NET from 10 Provincial Cities (PCs) attended.

This three-day workshop required the participants to do planning practices on Action Plan using PC in day 2nd and day 3rd and all trainees completed this intensive program.



As a result, the trainees obtained the

basic knowledge and information required for the formulation of a MSWM M/P, which was the primary objective of the workshop. In order to determine trainee’s understanding, they were asked to prepare the Concept of the M/Ps of their own respective cities.

In regard to this, they had to have an understanding of what the MUB SMW M/P was, and use it as an example to prepare the Concept of the M/Ps of their cities by themselves. At the end of the training, the Concepts of 10 cities were presented to confirm their understanding. The participants would be able to formulate their M/Ps provided they had a certain amount of expert support.



5. SWM in Local Province

Just after the above workshop, PC officials requested JET to give technical assistance on site and MONET has officially requested JET to visit three Provincial centers which are Darkhan, Erdenet and Bulgan.

JET has visited these three centers from 4th to 6th July 2011 and travelling distances are reached to 1,000km.



Every directors and officers in every provincial center has intention to improve SWM in their area, but lack of appropriate improvement plan has made difficult for them to acquire necessary budget. Therefore, plan of improving SWM in Bulgan Provincial center was formulated by JET for officers of NET in Bulgan Provincial center. Under the improvement plan, JET made several recommendations including improvement of final disposal site as follows.



Concept of improvement plan is to utilize existing final disposal site as much as possible and to consider operation and maintenance works as well after improvement work is implemented.

JET and Project Team is willing to contribute to assist these planning and waiting request from other Provincial centers as well.

6. Practical Training for Electrical System on Collection Trucks

Since commencement of the project, various activities for improvement of maintenance and operation of collection trucks such as investigation of conditions of trucks and field training has been conducted by JET in cooperation with EPWMD, CMPUA and all TUKs.

Under circumstances, such our



project organized practical training for electric system on collection trucks based on request of engineers and mechanics of CMPUA and TUKs during our cooperative activities for longer use of the equipment under good working conditions in future.

The outputs expected of the Training are:

- Participants learn how to calculate voltage of battery measuring specific gravity of it using hydrometer.
- Participants understand operation and role of relay.
- Participants learn how to read electric circuit diagram.
- Participants learn to properly make electric circuit using relay and fuse according to circuit diagram.



JICA senior volunteer Mr. Matsuda who works on central workshop of CMPUA since Nov 2010 lectured on the training. He has career for 40 years as mechanic in Japan and covered various kinds of vehicle for special use such as fire-fighting, waste collection trucks and so on. We hope participants use what they learned on their daily work. We are planning to have training on next spring so far. Also of course, we would like to frequently hold small scale of trainings according to their request.

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