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# **Report on 3R Policy Initiatives and Achievements**

**(Draft)**

**< Bangkok Metropolitan Administration >**

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# 3R Policy in Solid Waste Management by Bangkok Metropolitan Administration (BMA)

Solid Waste Management consists of three steps as follows:

1. Waste Minimization and Waste Separation
2. Waste Collection and Transportation
3. Waste Treatment and Disposal

## Waste Minimization and Waste Separation

The first step to decrease waste begins at home. To minimize waste and promote waste separation, the BMA has launched the **3R campaign (Reduce, Reuse and Recycle)** in many areas such as schools, institutions, organizations, and companies to raise environmental awareness and promote a clean and sanitary Bangkok. Specifically, the BMA has highlighted the importance of the “recycle” process as a vital mechanism in waste minimization and has begun some pilot activities as a model for the community, for example: In the past, the business about recycling packages has been rapidly developed which help sorting and recycling the waste up to 26% and brings them back to reproduce by junk shop, truck that buy second hand goods and recycle goods, junk collectors, and sorting waste workers. However, there still is about 10% of the recycle waste that still in the Waste Disposal Center. BMA found that food scraps and garden wastes were about 50% still left in the waste and the workers were not sorting them out as much. As a result, BMA need to highlight the importance of sorting unused material including food scraps, garden waste and reuse and recycle them. BMA has begun some pilot activities as a model for the community in 50 districts. The examples of the projects are as follow;

1. Pilot project on waste management and environmental protection.

In order to deal with waste management, the BMA conducts several pilot projects that vary by community, such as:

### 1.1 Community Based Solid Waste Management (CBM)

This project aims to decrease waste in the community by providing tools and instructions on how to deal with waste and waste management in the community. Providing community participation, every household in the community can join and be part of the waste management and environmental protection efforts. The aim of the project is not only to clean and sanitize the community but also to create a sense of unity.

#### Process of CBM

1. Raise awareness on solid waste and the environmental problems within the communities, businesses, academic institutions and public enterprises.
2. The communities take part in the solution by making decision and working together to solve the problems.
3. Build up knowledge and understanding on reuse and sorting waste before littering Management of waste bins in the communities to establish good environment.
4. Every household cooperate with each other in reducing the waste through reuse and recycle by sorting and selling to junk shop, waste banks, recycle markets. Moreover, people can compose food waste and garden waste to use them at home. However, for

communities which cannot make their own compost, the food waste can be given to farmers to make animal feeds or just feed their animals. After every households sort the waste, the waste would divided into 4 categories

- 1) recyclables
- 2) food waste
- 3) non-recyclable waste, and
- 4) households hazardous waste.

Waste management system can be managed by placing bins in houses and set designated times for collection (making the street free from garbage bins) in households, there will be two bins for:

1) food scraps to be composted or used as animal feeds 2) other general waste to be collected at designated times. For recyclable material, they can store them in the boxes or bags waiting for sell or donate. As for household hazardous waste, they can separate them to be collected by district

office. In addition, garbage bin-free streets by taking the bins off or placing them only at specific location, it will make the surrounding area look better. Then BMA will improve the scenery with trees and cleanliness in communities. Plant trees in front of houses where the garbage bins used to be.

The benefit that people received not only waste management but also the activities that people in the community interact with each other. They can exchange some ideas from sorting waste activities and sell the wastes. Moreover, they can share their problems and help each other to find some solutions. This will help people from the communities that join this project to have a good quality of life.

## **1.2 Environmental Protection Project**

The Thailand Environment Institute Foundation was assigned by the BMA to conduct research

on community-based solid waste management and environmental protection to study the different ways of

coping with solid waste management in each community and to publish a manual on their findings. This manual will serve as a waste management guidebook for the community. The target groups will cover in 5 categories 1) Flats and condominiums

2) Housing 3) Urban communities 4) rural communities and 5) slum (2 communities per category: 10 communities) After that the officers from district office will use their waste management guidebook with the communities (10 communities per category:

100 communities) Then BMA will be the result from that demonstration to improve their guidebook. After the result, BMA will expand their project and train district's

officer, leader of 2,000 communities including published the result of their study to public in order to share their knowledge to people and people can make use of the

knowledge. Moreover, Department of Environment will bring the result of target group especially flats and apartment, which has some problems with solid waste

management and the health

safety for the BMA garbage's worker, and set the guideline for waste management.

## **1.3 Development of Solid Waste Management in the district offices**

With the idea of turning district offices in Bangkok into self-learning centers, the BMA has launched the Solid Waste Management System as a model and to provide waste management information to the community. The district office will

provide the bins by types including recycle, food scraps, general waste, and hazardous waste. The recycle waste is sold, the food scraps are sent to compost.

And hazardous waste and non-recyclable waste are sent to proper disposal. Many of

district offices turn into self learning

centers. They also give the information and study tour about waste management in the district center to children and youth. They hope that people that come to the center can bring back their knowledge and apply them for daily use.

#### **1.4 Pilot school for waste separation and inclusive waste management operation**

Education is the best way to foster knowledge. The BMA sees education as a tool to cultivate

Bangkok's citizens and make them aware of the importance of environmental protection. BMA tried to promote schools to become the sorting waste learning center. BMA had set up the Biogas Production System from Organic Waste in 80 BMA's schools. Moreover, BMA would encourage schools to be a learning center for the public and develop the school into "zero waste model" school. BMA also provide schools with recyclable containers which act like waste recycle banks. In this case, it can reduce the workers work load. Such schools can then become models in complete cycle waste management, and move towards "zero waste" schools and learning center in waste management for the better environment.

#### **1.5 The development of an inclusive waste management service system**

Bangkok is a metropolitan area with a large number of people. Waste management should be dealt with in an inclusive way that both government and the private sector including district offices can collaborate on. As a result, the district offices, which responsible of collecting the waste and transport them from households, offices, shops to waste transfer station, would cooperate with private sector to do the complete cycle waste management. BMA by Department of Environment, Chatuchak district office, Coco-Cola Foundation (Thailand) and Thailand Institute of Packaging and Recycling Management for Sustainable Environment, Federation of Thai Industries, jointly organized a project on management of solid waste and recycled waste with complete cycle at Chatuchak district. The objective was to promote the management of solid waste and recycled waste with complete cycle for the government, private, and public sectors, with emphasis on waste management at sources. The target groups consisted of 9 communities, 2 academic institutes, 29 offices, 3 public parks, 1 market, 2 department stores, 1 hotel, and 120 restaurants. The scope of work covered occupational health and softly for waste collectors, building awareness of solid waste management at sources in every target group, and modification on the direction of waste collection by the District Office. These aimed at sustainable management on solid waste and the environment, social and economy in the project area. The project is to be implemented from 2nd June 2011 to 1st June 2013 (2 years). If the project becomes a success, it can be adapted for 50 districts of BMA.

#### **1.6 Sustainable Organic Waste Management Model**

BMA has collected successfully collect an organic solid waste more than 50% and it seems like BMA will be able to collect more waste. It is because of the campaign of sorting waste and people recycle their waste or selling them more. However, there are still have a lot of organic solid waste that easy to decay, smelly and accumulation of bacteria which people sorted and reuse them. As a result, BMA still have to provide them more information about how to make use of organic waste. For perfect waste management in Bangkok, the BMA highlights the importance of dealing with Organic Waste by sponsoring the following programs:

### 1) Promote the use of organic waste in the proper way

The objectives of this project are to converting organic waste into renewable energy to be used again and encouraging people to separate organic waste to be used as fertilizer instead of chemical fertilizers or insecticides. This way will help BMA to reduce the amount of food scraps that have to collect and dispose and also save BMA budget. Department of Environment has to provide each district about 50,000 baht per year for them to organize training courses, demonstrations about how to deal with waste for the communities, academic institutes, companies, government, public and private enterprise in the area. The training course are including how to make food scraps useful by making organic liquid fertilizer, organic compost, dried leaves compost, all purpose liquid, animal food, or biogas.

### 2) Wood and Dried leaves

The average of wood and dried leaves that district office collected everyday is about 200 tons. it will cost about 1,000 baht per ton, if dispose by landfill (200,000 baht per day). Dried Leaves are still useful in term of its fuel, wood vinegar or furniture. Since 2010, Department of Environment and district office were sorting a large wood to sell or donated to private sector for fuel. As for small branches of wood or dried leaves, they would compost them and mix with food scraps or organic liquid fertilizer and use them to plant the tree in the offices. One of the good example is Sai Mai district office, after the big flood, all the tree had been destroyed. Sai Mai district office has to recover traffic island and they use the fertilizer that they produce. As a result, they did not have to buy fertilizer and they can save their cost. If the district does not have crush composting or time to grind they can be sent to crush factory at On Nut and Nong Kheam which they can produce the fertilizer more than 10,000 tons per year and distribute them to many sectors to use.

### 3) Animal feeding such as fish, cows, and pigs

Organic waste that left over from cooking, the remaining of eating in restaurants, school canteens, hospitals, department stores, office buildings, markets, or even in the community, you can ask farmers to come and collect the waste. The farmer has a blue bin container (200 liter) that will place it at the designated area and they will come to collect the left over every day. In the fiscal budget 2012, district office had survey and encourages the farmer from 33 district to come and collect food waste for their animal. They found that the food waste had been collected about 100 tons per day. If they can implement this project to all 50 district areas, people will be able to collect food scraps and utilize them.

### 4) Promote biogas installations to minimize the amount waste

BMA can collect food scraps from market and produce methane gas and utilize them which can be used for cooking or electricity generation including lights and electric fan. The biogas capacity is about 500 kg/day to 2 tons/day of organic waste. Nowadays, many markets have been successful in producing biogas such as Thung Khru Market, Samyan Market, and Marketing Organization for Farmers. Moreover, the market not only can utilize biogas and reduce the waste in the markets, but also the dried sludge can produce composting and the left over liquid can produce organic liquid fertilizer to sell or give them to the customers. The result from reducing the waste in the market can call as Corporate Social Responsibility (CSR).

## 1.7 Inclusive Campaign on Solid Waste Management

During the time that BMA had developed model areas from the above mention project, including developed the handbooks, documents about sorting solid waste, solid waste management and environment, solid waste utilization, they also distributed the information to the people in all 50 district areas. BMA had organized many activities including Project on Reduction of Waste Reduce Global Warming, Project on Reduce Plastic Bags, Competition on Inventions from Unused Materials, The Training on Design Artifacts from Unused, Training Bangkok's volunteer for Environment Protection. In 2012, There are 628 communities leaders who become volunteer for Environment Protection. They will have responsibility on released information about solid waste management to the public.

### **Future Plan**

The BMA hopes to expand the focus of solid waste management to larger areas by using various media and publications including radio, television, newspapers, journals, magazines, documents. BMA also plan to promote effective model of waste management from communities, academic institutes, companies, and government offices and public enterprises and, at the same time, has to implement them in the household's level and develop efficient ways to deal with waste in Bangkok. Moreover, BMA needs to develop the strong network of environment protection volunteer and increase number of the volunteer to cover every area in Bangkok.

### **Waste Collection and Transportation**

According to the BMA strategic plan 2009-2012, the theme "Striving for Green Bangkok" is emphasized by providing waste collection services to all citizens. The implementation can be explained as follows:

#### **1. Schedule for waste collection**

BMA designates date, time and location for waste discarding by public and the district offices determine the details according to the areas, and the main criteria are:

1.1 The collection on main and secondary roads and markets are performed by setting up the time for the public to place the waste at designated location during 08.00 p.m.-03.00 a.m., and the waste shall be completed collected by 06.00 a.m.

1.2 Communities, small roads and lanes must be cleaned every day, and where waste collection trucks cannot reach, the district offices shall seek volunteers to collect the waste to the designated locations for the waste collection trucks on daily basis.

#### **2. Waste collection by types and Increased Frequency of Collection**

2.1 General waste: Daily or alternate days

2.2 Organic waste: Daily

2.3 Recyclable waste: Every Sunday

2.4 Household hazardous waste: On 1st and 15th of the month or designated day