

## **CURRENT STATUS OF SOLID WASTE MANAGEMENT IN YANGON**

A case study presented by Mr. Htay Lwin, Yangon City Development Committee

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#### **PROFILE OF YANGON**

Yangon formerly known as Rangoon in its popular and anglicised name is a city with a history of more than three thousand years, as related to the genesis of its world-famous Shwedagon Pagoda.

Modeled and constructed by Lt. Fraser, a British officer of the engineering corps, who was believed, also designed and constructed Singapore, Yangon had earned the name of model city in South East Asia, before the War. With its parks and gardens, lakes and pagodas and fine colonial buildings, like Custom House, Secretariat Strand Hotel, Yangon in those days was renowned for its beauty and cleanliness.

The city lies on a dagger-shaped peninsula at the confluence of Yangon River, Pazundaung Creek and Bago River in the central part of Yangon Division. The topography of the city comprises slightly undulating and hilly land in the center of the city and low flat land on the fringes of drainage channels which generally originate in the highest parts, run in all directions and finally drain into the Yangon and Bago Rivers.

The climate of Yangon is marked by three distinct seasons, namely the rainy season from June to September, Winter lasting from October to February and Summer from March to May.

The lowest temperature is about 25°C and the highest 35°C. Because of close proximity to the sea, the weather is generally cool and mild. But it can be very hot in summer.

The average annual rainfall is around 100 inches which adequately meets the demand of water supply to the citizens, from 4 main reservoirs located about 40 miles to the north of the city.

The city is the seat of administration, business and communication. Being the country's principal sea-port and air-port and connected with different regions of the country by various high ways and water ways. Yangon is an ancient, but modern city vibrant with all types of commercial, social, and cultural activities.

Yangon city is playing a crucial role in the transformation process of Myanmar's economy from the socialist to market oriented economy.

#### **ORGANIZATIONAL STRUCTURE**

The annexation of lower Myanmar in 1853 by the British led to massive influx of British ideas and institutions and construction of modern buildings after the British style. The first municipal organization established in 1789 underwent various transformations and reorganizations before and after the country regained its independence on 4 January 1948.

The present city authority, Yangon City Development Committee which was formed under the provisions of Yangon City Development Law of 14 May 1990, is an independent body, bestowed with wide powers and authority.

The Chairman of Yangon City Development Committee, concurrently the Mayor of Yangon, holds the position of a Senior Minister and is responsible directly to the Head of State: Under the Chairman, Vice-Chairman (Vice-Mayor), Secretary, Joint-Secretary, and Committee members currently 3 function virtually as a Cabinet, performing all relevant duties and functions, stipulated in Rangoon Municipality Act of 1922, which is still valid, and Yangon City Development Law of 14 May 1990. The organizational chart of YCDC is shown at Annexure (A).

The primary duties of the city Committee, such as street lighting, water supply, garbage disposal, maintenance of parks and gardens, markets, slaughter houses remain unchanged. Additional powers vested in the Committee by virtue of Yangon City Development Law, among the other things, to demarcate and redemarcate the territorial limits of the city, to authorize the Committee city, to operate city development works independently with its own funds, to assess and levy its own taxes, to utilize the foreign currency derived from the lease of its own lands and premises for development works and to take loans and grants from the Government or from foreign organizations on its own responsibility.

The income of former municipal organizations entirely depended on property tax, made up of watertax, conservancy tax and general tax. The income from property tax today amounts to a small fraction of the annual budget, the principal source of income being from the condominiums, hotels, markets, and gold courses belong to YCDC and from vehicle tax.

The committee's annual budget registers a total income and expenditure of approximately Kyats

15 billion and US dollars 20 million. The income from solid waste management is negligible. However, the Committee is striving its best to maintain Yangon City's image of a garden city, with 400 strong workforce of its Cleansing and Pollution Control Department. The cleansing staff works day and night in the shifts. Organizational chart of Pollution Control and Cleansing Department is shown in Annexure B.

### **SOLID WASTE MANAGEMENT**

As it is happening in most major cities, the waste management problem has already become severe in Yangon City. The problem is compounded by the rapidly increasing amounts of wastes of complex nature and composition, which result from the growth in the City's population and the changes in the consumption patterns. The problem is further compounded by the uncontrolled growth of industries and business community, without proper legal enforcement to ensure pollution control.

### **SOLID WASTE GENERATION**

Solid waste generation in the city in 1999 was estimated at about 3,000 tons per day. In industrial and agricultural sectors, all activities are currently low level and solid wastes generated from industrial and agricultural activities are not severe. Due to rapid increase in urbanization, area of Yangon City becomes wider and PCCD has to collect the solid waste in larger extent across the area of city. However, gradual increase in population cause the generation rate in regular order.

Amount of waste generated in Yangon City each year is stated as follow:

<u>Year</u>	<u>Amount of waste generated</u>
1990	0.40 kg/cap/day
1995	0.48 kg/cap/day
2000	0.52 kg/cap/day

Percentage contribution of the garbage generated is shown as the following:

<u>Source of Solid Waste</u>	<u>% Contribution</u>
1. Kitchen	60
2. Market	15
3. Hotel	2
4. Garden	5
5. Commercial	10
6. Other	8

Typical Composition of solid waste is reported as the following and detail typical composition of Solid Waste in each Township is attached in Annex C.

<b>Type of solid Waste</b>	<b>Domestic Waste</b>		<b>Market Waste</b>		<b>General Waste</b>	
	<b>Wet Season</b>	<b>Dry Season</b>	<b>Wet Season</b>	<b>Dry Season</b>	<b>Wet Season</b>	<b>Dry Season</b>
1. Vegetables, fruits, leaves, branches, grass, etc.	58	52	63	49	67	46
2. Paper	1		9	2	7	13
3. Plastic	4	1	8	1	5	2
4. Dead animal, bones, and waste	4		2	18	1	5
5. Ashes and dust	2	13	1		1	12
6. Cane, bamboo	11	8	14	19	3	2
7. Others	20	18	3	10	16	20
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

### **WASTE HANDLING AND SEPARATION, STORAGE, AND PROCESSING AT THE SOURCES**

Most families use plastic bag, basket, and other containers for site storage and concrete tanks are used for communal storage. Some families used to separate garbages to sell it to the plastic collectors as a small income. There are a few activities in processing of garbages. Some families make natural fertilizers from garbage by using the fermentation process. Most families have a little willingness to store their

refuses in their homes or site for a period, not more than one day due to putrescence of refuses.

### **COLLECTION**

PCCD possesses 270 collection vehicles and uses these of 159 units daily as of 2000. It is reported that the waste collection ratio in Yangon City is only 50-60%. In one word, the features of SWM in Yangon City are basically laborintensive and uncontrolled, Collection as practiced by YCDC can be categorized into three types:

1. Bell ringing system (in this system, collection vehicles pass through streets with bell ringing sound so that people can come our to dispose garbage)
2. Collection at a street dumps, and
3. Limited collection of market wastes and other wastes.

Collection service of 6 Township at CBD area is privatized to 6 private companies, respectively. The collected solid wastes are hauled into waste dumping sites, which are located at central area and its surroundings of the city.

Waste generated from hospitals are basically separately collected and disposed by PCCD. PCCD also collects the part of industrial wastes at the request of respective factories concerned and disposes of along with domestic wastes. Detail Waste quantity and coverage level of collection by YCDC (PCCD) are as per Annex-D.

In collection services, PCCD used mostly 4 ton-dump truck in totally 270 collection vehicles as shown below:

#### **Current Conditions of Collection Vehicles possessed by PCCD**

Type	production year	operation <u>On-road</u>	condition <u>Off-road</u>	No. of Unit
■ 4 Ton-Dump Truck	1990	128	3	131
■ 4 Ton-Compactor	1990	46	27	73
■ 2 Ton-Compactor	1990	34	1	35
■ 3 Ton-Tractor	1975-1979	28	3	31
Total		236	34	270

#### **Amount of Cleansing and Collection Services Fee**

<u>Area</u>	<u>Fee (Kyat/month)</u>
CBD	60
Suburban	45
Satellite	30

PCCD charges as property tax for collection as in above table. Collection charges for one truck-loaded commercial waste (about maximum 3 tons) is 1500 kyats only.

Generally, main issues on waste collection are:

- Inadequate waste collection
- Lack of facilities
- Insufficient public participation
- Lack of law enforcement

### **TRANSFER AND TRANSPORT**

At present, only transportation of solid waste is performed by PCCD and there is no transfer station in the area of Yangon City. But, hauled distance may be so far if Htein Pin dumping in Hlaingtharyar township is selected and operated as a final disposal site and therefore, introduction of waste transfer system is required in Yangon City as a top priority, in order to transfer the waste to the designated final disposal sitd in Htein Pin.

### **DISPOSAL**

There were a number of dumping sites that are used for waste dumping in Yangon City three years ago. These were located about 7 to 15 km away from CBD (central business district) area and those areas are

about 1 hectare or thereabout. The dumping duration at one site was normally one or two years or five years at most. These dump sites were not controlled. These uncontrolled sumps were causing a number of health hazards from pathogenic organisms, insects, rodents and air pollution from dust, accidental burning, offensive odors as well as ground and surface water pollution through leachate.

In 1995, YCDC secured the land in order to introduce new main disposal site in Hlaing Tharyar Township named "Htein Pin". Proposed site of Htein Pin is located approx. 26 km west from the city center and the area is about 120 hectare. Htein Pin FDS will cover the waste generated at western part of Yangon City. At present it is being constructed and has to operate as a "West Main Final Disposal Site".

To add to the problem, residents commonly dispose of their solid waste into the alleys, streets, BDS (back drainage space), rivers, channels, and drains/ditches indiscriminately. These are not only causing a number of health hazards from pathogenic organisms, insects and rodents, etc. and environmental impacts but also affecting negative landscape images. They also represent specific health risks to municipal workers, waste pickers and residents living close to the dumps. The disposal of garbage in street drains and ditches causes blockages and contribute to increase of flooding in rainy seasons. Issues on waste disposal are

- Unsanitary conditions of all uncontrolled dumping sites
- Lack of equipments
- Lack of technical support

Small cottage industries are playing important role in recycling. But at present, recycling of municipal waste is not fully and systematically developed in Yangon City yet. Some recyclable materials such as paper, plastics, etc. are collected separately from municipal waste and used for recycling practices. Normally domestic industries process the collected recyclable materials further into raw materials for final products. At present many small-sized paper mills and plastic industries are producing recycled products. However there are no reliable data on the amount of recyclable materials collected or the number of recycle factories. Prevailing issues on waste recycling are as the following:

- Improvement of appropriate technology for recycling process
- Encouragement of recycled activities
- Improvement of marketability
- Improvement of mechanization in recycling process

Composting was introduced in Yangon in 1999 for the purposes of:

- 1<sup>st</sup> to solve the problem of insufficient amount and/or high cost of chemical fertilizer,
- 2<sup>nd</sup> to produce the wealth (compost) from the municipal waste and
- 3<sup>rd</sup> to provide natural fertilizer for farmers with low cost

Compost plant located in Padamyar Myothit, Mingladon Township is operated under control of Ministry of Agriculture and Irrigation and produced approx. 200,000 bags (25 kg/bag) of compost during the last 15 months. The compost products are sold/distributed to nine (9) States/Divisions in Myanmar, such as Sagaing Division, Yangon Division, Bago Division, Mandalay Division, Kayin State, Rakhine State etc. Composting is only as initial stage at the moment and it should be necessary to make measures for significant progress from pilot scale to composting industry. Issues on the composting are:

- Improvement of technical know-how
- Lack of monitoring instrument
- Fulfillment of sorting process

### **SOLID WASTE MANAGEMENT PROBLEMS**

Solid waste collection and disposal is indeed a major problem faced by PCCD same as municipal authorities of developing countries. The most common problems of waste collection faced by PCCD can be defined as follows:

- Institutional deficiencies:
- In-adequate legal provision; and
- Resource constraints

### **INSTITUTIONAL DEFICIENCIES**

A number of institutional deficiencies exist in the practices of urban waste management in Yangon City. These deficiencies, individually or collectively, effect the efficiency of waste reduction and waste recycling. Some of common deficiencies are:

- The waste collection, transportation and disposal operation is divided among many government agencies and among different levels of local government. This causes problems lack of coordination and overlapping of responsibility.
- The lack of coordination among different sectoral agencies of the government, whose collective effort is crucial, is hampering initiatives to develop waste reduction and waste recycling programs.
- The beneficiary community is largely ignored in the design and implementation of the waste reduction and waste recycling initiatives.
- Benefits of involving non-governmental and community-based organization are not fully used.
- The beneficiary cooperation of the waste recycling industry, both the formal and informal sectors, to reduce the waste is not fully realized.
- Waste management staff often lacks the know-how on waste recycling technologies and do not fully comprehend the social, economical and environmental aspects of waste recycling.

### **INADEQUATE LEGAL PROVISION**

The law and regulations on solid waste management are outmoded and fragmented and hence are inadequate to deal effectively with the modern complications of managing waste at the time being. Most of the laws deal with the general tidiness of the city streets, waste collection and their disposal at places away from settlements. Even the inadequate laws are not fully enforced, which further aggravates the situation.

### **RESOURCE CONSTRAINTS**

Waste management authorities of PCCD are severely constrained by the lack of resources to finance their services. Collection and transport usually dominate solid waste management costs in Yangon City. Funds are often lacking for the purchases of new landfill sites, equipment, and transport vehicles, for the installation of additional communal bins and other facilities, for the recruitment of additional staff, and for the maintenance and operation of equipment and vehicles. Funds are unavailable for addressing software issues of waste management, such as promotional campaigns and training.

Major issues and constraints of Solid waste management in Yangon City are summarized as follows:

- No comprehensive plan on SWM
- Lack of data on waste amount and composition generated.
- Indiscriminate dumping at unauthorized places like sidewalks, storm drains/ditches, waster bodies, wet-lands etc. causing serious public health risks, environmental impacts and negatively affecting landscape as well.
- Present landfill practice is uncontrolled and unhygienic. New landfill site in the east has to be found our and controlled landfill shall be introduced.
- Collection and hauling is irregular, not sufficient and nor complete. Waste transfer system has to be introduced urgently.
- Inefficient collection routine and coverage area
- Other alternate waste volume reduction systems like separate collection, recycling, composting, etc. are not fully and systematically developed.
- Limited human resources in concerned agencies (incl. Institutional structure).
- Lack of citizen's awareness on sanitation/ environment.
- No enforcement of solid waste regulations. There is very limited control over hospital and industrial waste.

### **FUTURE PROSPECTS**

Under the guidance of leadership of the country, the Mayor of Yangon and all members of the City Committee, are fully committed to engage in all activities which will continue with the maintenance of Yangon as a pleasant liveable city. Environmental control and solid waste management are the top priority of the Committee. In the present transitional stage from simple sanitary land-filling to composing

and recycling for garbage disposal, YCDC hopes to achieve some form of intra.city assistance in terms of technology, machinery and equipment. A positive development in this context is a plan which has been recently worked out between YCDC and the Private Fund Institute (PFI) together with the help of machinery assistance from UD Techno Corporation in Japan, to introduce a new system whereby vegetable components and components from fish and prawn waste will be mixed, grinded and turned into small tablets of fish meal and animal feedstuff. This is definitely a positive development and YCDC highly appreciates all Japanese initiatives and assistance designed to help maintain the image of Yangon as a liveable and sustainable city.

THE STATEMENT BY MR HTAY LWIN, DELEGATE  
FROM YANGON CITY DEVELOPMENT COMMITTEE  
AT KITAKYUSHU INITIATIVE SEMINAR  
ON SOLID WASTE MANAGEMENT

Mr. Chairman,

I am greatly honoured and privileged to attend this Seminar of Solid Waste Management, which is being held at the initiative of Kitakyushu City. I bring to this Seminar greetings from the Mayor of Yangon and his best wishes for its resounding success.

As all nations and major cities of the world are grappling with the challenges and the impact of globalization and IT revolution, affecting all sectors of human society, we are gathered here today to discuss one of the fundamental issues of urban management, I mean Solid Waste Management. The complexity of this common problem facing every city is compounded by the increase of urban population and the growth of industry and commerce.

For Yangon, the capital city of Myanmar with a population of over 5 million people spread over 33 townships in an area of nearly 300 square miles, the present status of Solid Waste Management, though rather primitive and outmoded, is fairly adequate in terms of environmental protection and pollution control. About 4000-strong workforce of Cleansing and Pollution Control Department of Yangon City Development Committee are working day and night in three shifts to keep city clean and pleasant.

However, collection of more than 3000 tons of garbage daily with a motley fleet of about 300 vehicles, including open trucks, is a daunting task for YCDC. Collection of garbage at street dumps and bins as well as land-filling system we are using today are far from satisfactory. To upgrade the collection and disposal systems, the city is in need of technology, machineries and equipment. In short-term strategy the situation can be remedied if a proper transfer station can be established.

The composting method being applied at a small plant operated under the control of Ministry of Agriculture and Irrigation has produced only about 200,000 25-kg bags of compost during the last 15 months.

Mr. Chairman,

The problems of Solid Waste Management in Yangon, such as institutional deficiencies, inadequate legal provision and resource constraints are fully set out in the case study paper distributed among the participants of this Seminar. I think it will suffice for me just to summarize the major issues and constraints of Solid Waste Management in Yangon as follows:

- No comprehensive plan on SWM sector.
- Lack of data on waste amount and composition generated.
- Indiscriminate dumping at unauthorized places like sidewalks, storm drains/ditches, water bodies, wet-lands etc. causing serious public health risks, environmental impacts and negatively affecting landscape as well.
- Present landfill practice is uncontrolled and unhygienic. New landfill site in the east has to be found out and controlled landfill shall be introduced.
- Collection and hauling is irregular, not sufficient and not complete. Waste transfer system has to be introduced urgently.
- Inefficient collection routine and coverage area
- Other alternate waste volume reduction systems like separate collection, recycling, composting, etc. are not fully and systematically developed.
- Limited human resources in concerned agencies (incl. Institutional structure).
- Lack of citizen's awareness on sanitation/environment.
- No enforcement of solid waste regulations. There is very limited control over hospital and industrial waste.

A recent positive development for Yangon is a plan being worked out between YCDC and the Private Fund Institute (PFI) in Japan for introducing a new system of recycling by converting vegetable components and fish and prawn waste into fish meal, and animal feed stuff. I wish to convey my sincere appreciation of Yangon City Development Committee, to Sponsors of this method. I also wish to express my gratitude to organizers of this Seminar for inviting me to this very important gathering. The views, experiences and the visions of other cities presented at this Seminar will certainly contribute to improvement and upgrading of the Solid Waste Management in Yangon.

Thank you.