

# A Follow-up Seminar on KitaQ System Composting in Asia



## SEMINAR REPORT

17 – 20 July 2012

JICA Kyushu International Center, Kitakyushu, JAPAN



*This report was finalized on the basis of the information provided, discussions and outputs of working groups of the Follow-up Seminar on KitaQ System Composting in Asia held in Kitakyushu, Japan during 17 – 20 July 2012. It was edited by Dickella Gamaralalage Jagath Premakumara, Andante Hadi Pandyaswargo and Simon Gilby, IGES. The authors would like to thank all the participants for their contribution. Special thanks also go to Dr. Yoshida, JICA, Dr. Akino and Mr. Gingin from Surabaya City for their valuable expertise given in organising the workshop sessions and discussions. We would also like to thank Ms. Tamura, Ms. Ikemoto, Ms. Yokoyama from JICA, KIC, Mr. Yamashita, Kitakyushu City, Mr. Nagaishi, KITA, Mr. Maeda and Mr. Nakamura, IGES and Ms. Yaoya, J-POWER group/JPec for their valuable support and technical inputs in organising this seminar.*

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### **Published by**

Japan International Cooperation Agency (JICA)  
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Printed in Japan



## DAY 1: 17 July

A Courtesy Visit to Kitakyushu City Office and Kitakyushu Environmental Museum in Yahata



## DAY 2: 18 July

Welcoming Remarks



Presentations by the Participant Cities





## DAY 3: 19 July

Group Discussions and Visioning Exercise on Capacity Development for Composting



Practical Learning on How to Make Composting and Utilization for Organic Farming

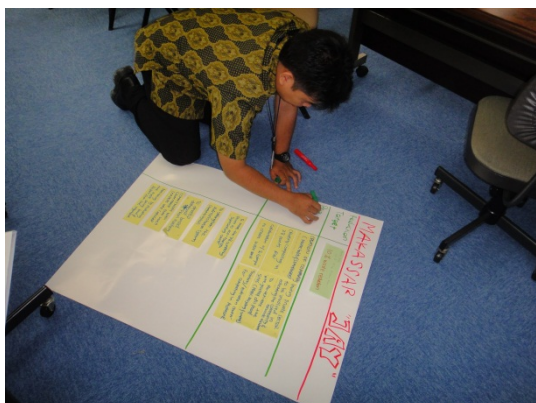


## DAY 4: 20 July

Site Visit to Bin/Can Recycling Center and Waste Sorting Facility of BEETLE Co. Ltd.



Action Plan Preparation and Presentations by the Cities





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- List of Participants
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## 1. GENERAL OVERVIEW

### 1.1. BACKGROUND

Decentralised, community-based composting is considered to be an effective approach for organic waste management, achieving sustainable development and mitigating greenhouse gas (GHG) emissions in cities. It can bring environmental and health benefits to residents through appropriate waste collection and treatment at the neighbourhood level. By treating solid waste near to source, it minimises transportation costs, reduces the amount of waste added to landfill, prolongs the life of landfills, and reduces municipal costs for landfill management. The composting plants can provide new job opportunities and extra income for the urban poor and waste pickers, recruiting them as workers in compost plants or integrating them into the recycling business. Further, it helps increase environmental awareness among the community, and creates space for community involvement in decision making and taking action at the neighbourhood and city levels.

Against this background, the Japan International Cooperation Agency (JICA), Kyushu international Centre (KIC), Kitakyushu City, the Kitakyushu International Techno-Cooperative Association (KITA), the Institute for Global Environmental Strategies (IGES), Kitakyushu Urban Centre (KUC) and the JPOWER Group/JPec Co. Ltd. have worked together to introduce the KitaQ System Composting, a community-based solid waste management (SWM) and composting programme in Asian cities. The following diagram shows the roles and responsibilities of each partner institution.



### 1.2. KITAQ SYSTEM COMPOSTING

The KitaQ System Composting is a community-based SWM and composting programme aimed at building the capacity of cities in Asia in reducing municipal solid waste sent to landfill. It does this by promoting composting in collaboration with citizens, community-based organizations (CBOs), non-governmental organizations (NGOs), private sector and other interest groups. It is an integrated approach based on Kitakyushu city's municipal solid waste management (MSWM) know-how and experiences in working with Surabaya City. It encourages member cities to setup waste reduction targets; introduce waste separation at source; compost at household, community, market or private premises using the Takakura Method (a simple composting method introduced by Mr. Koji Takakura of JPOWER Group/JPec Co. Ltd in Kitakyushu City); use compost products for city greening and community gardening; establish waste bank or material recovery facility (MRF) integrating the informal recycling sector; and introduce or strengthen



environmental education for citizens as well as schools. The ultimate objective of this initiative is to achieve a sound material-cycle and low carbon cities in Asia.

### 1.3. OBJECTIVES

The number of cities involved in applying the KitaQ System Composting into their MSWM policies and strategies has increased and JICA, KIC has also introduced the method in its training programmes for overseas participants and Japan Overseas Cooperation Volunteers (JOCVs). A follow-up networking seminar was therefore organised in Kitakyushu City, 17-20 July 2012, inviting related cities and organisations to:

- Provide opportunities to present the progress achieved;
- Discuss existing challenges;
- Identify effective strategies and actions to overcome those challenges; and
- Facilitate further networking and cooperation.

### 1.4. PARTICIPANTS

The seminar was attended by 19 participants from 13 cities in Asia and South America. The invited participants included representatives from local governments, national institutions and partner organizations such as NGOs, who are actively involved in community-based SWM and composting activities, from the following cities.

A List of Participated Cities	
<i>Follow-up Cities</i>	<i>Observer Cities</i>
<ul style="list-style-type: none"> <li>• <i>Indonesia:</i> Balikpapan, Palembang, and Tarakan</li> <li>• <i>Philippines:</i> Cebu</li> <li>• <i>Malaysia:</i> Sibu and Kampar</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Indonesia:</i> Makassar, Mataram and Cianjur (Counterpart of JOCV)</li> <li>• <i>Sri Lanka:</i> Kuliyaipitiya and Badulla (Counterpart of “Capacity Upgrading Project for the National Solid Waste Management Support Centre”, JICA, Counterpart of JOCV )</li> <li>• <i>Malaysia:</i> Hang Tuah Jaya (Counterpart of “Promote for Efficiency of Waste Management in Malaysia”, Kitakyushu City/KITA/JICA)</li> <li>• <i>Peru:</i> Lima (Counterpart of “Solid Waste Management Project”)</li> </ul>
A List of Other Cities in the KitaQ Composting Network (Did Not Participate)	
<ul style="list-style-type: none"> <li>• <i>Indonesia:</i> Central Jakarta, Semarang</li> <li>• <i>Philippines:</i> Bago, Puerto Princesa, Talisay (Negros), San Fernando (La Union)</li> <li>• <i>Thailand:</i> Bangkok (BMA), Nonthaburi, Sri Lacha, Sankanpaen</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Sri Lanka:</i> Kurunegala, Matale</li> <li>• <i>Philippines:</i> Mandaue, Sagay</li> </ul>



### 1.5. KEY SESSIONS OF THE SEMINAR

The seminar included presentations regarding individual cities' experiences, interactive discussions and site visits. The interactive discussions were facilitated through small group discussions and plenary sessions, which were designed to draw on the learning from the city presentations. Further, a model of successful practice of KitaQ System Composting in Surabaya City was presented from both an analytical and practical perspective to serve as a basis for discussion. The contents of the three day workshop included:

- Presentations (progress report presentations and experience sharing by the participant cities, related organizations and experts);
- Site visits and observations (composting techniques, environmental education, public/private participation in waste separation and composting, organic farming and other treatment facilities in Kitakyushu City); and
- Discussions among participants which included setting specific waste reduction targets and identifying specific actions to achieve those targets in collaboration with other stakeholders in the city.

### 1.6. KEY LESSONS LEARNED

The participants discussed the following key points during the seminar:

- There have been a variety of issues and developments which have encouraged cities to promote composting as a part of MSWM. They include increasing waste generation and allocation of municipal budget for SWM, environmental and health issues due to inadequate waste collection uncontrolled disposal, high proportion of organic waste in MSWM, national and local policies for establishing the 3Rs, public pressure for stopping uncontrolled landfilling, and international assistance for promoting 3R activities.
- The community-based approach of the KitaQ System Composting is effective for developing countries due to its low financial costs; flexible implementation due to its applicability at the household, community and city-wide levels; ability to integrate into the existing SWM system; and provides a good opportunity to improve the overall performance of city's MSWM.
- Initial implementation of the programme should be through a pilot project in a selected community. Key activities which can be implemented in the pilot project include waste separation at source; composting at a backyard or community composting centre; establishment of MRF or a waste bank for recycling; promotion of environmental education; community gardening; and the disposal of residual materials in an environmentally friendly manner.
- The process and impacts of the pilot project should be documented using both qualitative and quantitative indicators for learning and sharing with other communities.
- The pilot project can be implemented by the city government, NGO, CBO, private sector or any other interested group by individually or together.
- After the pilot project is mature enough to share its experiences with others, the city government should take a leading role in scaling-up this initiative to other communities. In order for this to occur, the city government needs to create an enabling environment with a variety of strands, including policy (waste reduction targets, zero-waste recycling and composting targets, no-segregation no-collection, landfill ban, non-plastic bag day, and promotion of organic farming); institutional (creation of new carder system, such as environmental carders in Surabaya, barangay environmental officers in Cebu, composting advisors in Kitakyushu City, planning and monitoring mechanisms, such as coordination meeting, local agenda 21 committee, regular information sharing); financial (subsidies for capital investment and operational costs); social/other (environmental education campaign, training and capacity building, award system).



- Participants agreed that the creation of enabling environments is easier if the mayor or top officials in the city government are committed and supportive. However, in order to ensure successful implementation, partnerships with all other stakeholders should be established.

## 1.7. OUTCOMES

The seminar successfully achieved the original objectives as follows:

- A key outcome of the seminar was the commitment by the participants to take voluntary actions to set specific waste reduction targets and identify strategies to achieve those targets by 2013 (see Table 1).
- Another key outcome was the launch of the KitaQ System Composting Website ([www.kitaq-compost.net](http://www.kitaq-compost.net)) for monitoring the progress made by the participants and sharing knowledge among the participants and other interested parties.
- Participants further identified that the new website can be a useful forum for them to share their experiences regardless of borders, so that those with less understanding and experiences could benefit from those with more experiences.
- Further, the importance of capacity development for municipal solid waste management and composting was reconfirmed. To meet this demand, JICA, KIC has established a new training programme on Composting Management, which will be held in Aug/Sep 2012.
- In addition, participants identified the necessity of documenting best practices and develop training tools and manuals for knowledge transfer and technical cooperation.

## 1.8. FOLLOW-UP

The following activities are identified as follow-up activities of the seminar:

- As an immediate follow-up action to the seminar, a seminar report will be prepared including all presentations and discussion points.
- A voluntary monitoring of the implementation of action plans by each city using the KitaQ Composting Net.
- Organize a JICA training programme on Composting Management from August to September 2012 and to be continued until 2014.
- Organize a study visit for a team of staff members (including the Mayor and Councillors) from Kampar City to Surabaya in Nov 2012.
- A regional workshop in Cebu inviting the cities from Metro Cebu area to share the lessons learned in implementing the community-based SWM and composting in Nov/ Dec 2012.
- Inviting some selected cities to share the experiences at the Regional 3R Seminar in Vietnam 2013.
- Organize a seminar in Sri Lanka, in collaboration with Badulla City, Kuliyaipitiya City and JOCV to introduce the KitaQ System Composting in Sri Lanka.
- Preparation of Policy Brief(s) documenting the successful experiences of Surabaya, Cebu and others.
- Finding the possibility in organizing the follow-up workshop to share the progress in 2013.

**Table 1: City Voluntary Commitments for Achieving Municipal Waste Reduction Targets**

Name of the city	Population	Waste generated	Waste reduction target	Proposed actions	Remarks
<b>Indonesia</b>					
<b>Palembang</b>	1,700,000 (2010)	750 tonnes/day (2010) 62% organic	20% by 2013 (from 2010)	• Expand Eco-village programmes in 17 sub-districts	Made commitments in 2011 and



				<ul style="list-style-type: none"> <li>• Cooperation with NGOs and private sector</li> <li>• Training, study visit and capacity building</li> <li>• Information dissemination and competition</li> </ul>	presented progress in 2012
<b>Tarakan</b>	230,000 (2010)	130 tonnes/day (2010) 52% organic	20% by 2014 (from 2010)	<ul style="list-style-type: none"> <li>• Promote waste segregation at source</li> <li>• Establish 20 composting plants within the city to accept all organic materials</li> <li>• Collaboration with agricultural department to market the compost</li> <li>• Training, capacity building, information management</li> <li>• Encourage partnerships between community, NGOs and private sector</li> </ul>	Achieved 3% waste reduction so far. Made commitments in 2011 and presented progress in 2012
<b>Balikpapan</b>	630,000 (2010)	500 tonnes/day (60% organic)	20% by 2014 (from 2010)	<ul style="list-style-type: none"> <li>• Expand community-based composting to all 12 sub-districts</li> <li>• Education, training, information dissemination</li> <li>• Utilization of composting for city greening</li> <li>• Develop regulations, by-laws to support community-based composting</li> <li>• Conduct monthly meetings with community groups</li> </ul>	Made commitments in 2011 and presented progress in 2012
<b>Makassar</b>	1,340,000 (2010)	600 tonnes/day (2010)	10% by 2013 (from 2010)	<ul style="list-style-type: none"> <li>• Expand community green and clean programme in each community</li> <li>• Expand community composting plants in 78 neighborhoods</li> <li>• Central waste bank in the city</li> <li>• Training and education center</li> <li>• Collaborate with the private sector</li> <li>• Distribution of education material and tools</li> <li>• Sign MOU with city and other stakeholders to establish composting plants</li> <li>• Monthly monitoring meeting</li> </ul>	Made commitments in 2011 and presented progress in 2012
<b>Mataran</b>	402,000 (2011)	150 tonnes/day (2011)	30% by 2015 (from 2011)	<ul style="list-style-type: none"> <li>• Develop pilot neighborhoods (waste bank, compost facility and organic gardening)</li> <li>• Introduce 3R at schools</li> <li>• Collaborate with other stakeholders and share responsibilities</li> <li>• Collect base-line data on waste generation and characteristics with academic groups</li> <li>• Train and capacity build CBOs</li> <li>• Monthly meeting to report progress.</li> </ul>	Made commitments in 2012
<b>Cianjur</b>	Included villages	18	5% by 2014 (based on 2012)	<ul style="list-style-type: none"> <li>• Survey of solid waste generation in the area</li> <li>• Environmental education</li> </ul>	Made commitments in 2012



				<ul style="list-style-type: none"> <li>at schools</li> <li>Partnership with private sector for initiating community pilot composting projects</li> </ul>	
<b>Philippines</b>					
<b>Cebu</b>	810,000 (2011)	470 tonnes/day (2010) 50% is organic	35% by 2013 (from 2010)	<ul style="list-style-type: none"> <li>Expand community-based composting city-wide</li> <li>Create an award system for eco-agri and eco-tourism barangays</li> <li>Collaborate with citizen groups, NGOs, and private sector</li> <li>Create mechanism for buying compost from barangays</li> <li>Move towards GHG reduction through composting</li> <li>Build barangay environmental officers' capacity</li> <li>Monthly monitoring meetings and data management</li> </ul>	25% waste reduction so far Made commitments in 2011 and presented the progress in 2012
<b>Malaysia</b>					
<b>Kampar</b>	120,000 (2010)	120 tonnes/day (2010) 40% is organic	14% by 2014 (from 2010)	<ul style="list-style-type: none"> <li>Expand capacity of compost centre at landfill from 5.5 tonnes to approx. 10 tonnes/month</li> <li>Replicate compost activities to 3 new housing areas to achieve a total of 400 houses in 7 housing areas</li> <li>Setup 3 kindergarten schools for 3R activities</li> <li>Setup 2 pilot project oil waste collection centres</li> <li>Establish new partnerships for handling the project</li> <li>Allocate budget</li> <li>Create a training and seminar awareness programme via LA21</li> <li>Proper data management and coordination meetings to be established</li> </ul>	10% waste reduction from pilot areas. Made commitments in 2011 and presented the progress in 2012
<b>Sibu</b>	240,000 (2010)	130 tonnes/day (2010) 50% organic	15% by 2013 (from 2010)	<ul style="list-style-type: none"> <li>Manage existing composting plants (3 in neighborhoods and 3 in schools)</li> <li>Distribute free seed compost to households</li> <li>Collaborate with neighborhood associations</li> <li>Enact by-laws for waste segregations</li> <li>Collect market waste separately</li> <li>Monthly meeting at LA21 and data management to be established</li> </ul>	Made commitments in 2011 and presented the progress in 2012
<b>Hang Tuah Jaya</b>	115,000 (2011)	125 tonnes/day (2011) 54% is organic	10% by 2015	<ul style="list-style-type: none"> <li>Expand the existing composting programmes</li> <li>Collaborate with the private sector</li> <li>Awareness programmes for waste separation to be created</li> <li>Law enforcement to be</li> </ul>	Committed in 2012



				<ul style="list-style-type: none"> <li>enhanced</li> <li>Budget allocation for composting programmes</li> <li>Capacity building for staff</li> <li>Data-base management</li> <li>Monitoring</li> </ul>	
<b>Sri Lanka</b>					
<b>Badulla</b>	45,000 (2011)	25 tonnes/day (2011) 80% is organic	10% by 2013	<ul style="list-style-type: none"> <li>Master plan for solid waste management and composting</li> <li>Establish marketing strategy for composting and recycling</li> <li>Capacity building for solid waste management team</li> <li>Law enforcement</li> <li>Collaborate with the public and private sectors.</li> <li>Monitoring committee and regulatory committee to be established</li> </ul>	Made commitments in 2012
<b>Kuliyapitiya</b>	13,000 (2011)	10 tonnes/day (2011)	10% by 2013	<ul style="list-style-type: none"> <li>Public to participate in waste separation at source</li> <li>Separated waste collection in the city</li> <li>Awareness for citizens and schools</li> <li>Monthly meeting with CBOs, NGOs and private sector</li> </ul>	Made commitments in 2012
<b>Peru</b>					
<b>Peru (Lima)</b>	2,835,000 (2011)	17,200 tonnes/day (2011) 50% is organic	5% by 2014	<ul style="list-style-type: none"> <li>Organize citizen groups</li> <li>Define strategic objectives</li> <li>Project dissemination, capacity building</li> <li>Establish pilot composting plant</li> <li>Organize workshop and monthly progress report</li> </ul>	Made commitments in 2012



## 2. PROCEEDINGS

This seminar included plenary presentations (progress report presentations and experience sharing by the participants, related organizations and experts), interactive discussions among participants (which included setting specific waste reduction targets and identifying specific actions to achieve those targets in collaboration with other stakeholders in the city), and site visits (observation of composting techniques, environmental education, public/private partnership in waste separation and composting, organic farming and other treatment facilities in Kitakyushu city).

The summary of presentations, key discussion points, and outcome of the each session is presented below. All speaker presentations as well as supplementary materials, such as the seminar background papers and list of participants are attached in the annexes after the main text.

### TUESDAY, 17 JULY

#### 2.1. PRE-PROGRAMME

AFTER A BRIEF ORIENTATION AT JICA, KIC, PARTICIPANTS HAD AN OPPORTUNITY TO VISIT KITAKYUSHU CITY OFFICE AND KITAKYUSHU ENVIRONMENTAL MUSEUM IN YAHATA.

##### 2.1.1. A COURTESY VISIT TO KITAKYUSHU CITY OFFICE

- Mr. Kenji Kitahashi, the Mayor of Kitakyushu City
- Mr. Keiichi Muraoka, Director General, JICA, KIC

At the city office, Mr. Kenji Kitahashi, the Mayor of Kitakyushu City warmly welcomed the participants from different countries in Asia. He gave a brief introduction regarding Kitakyushu city's long history of commitment to international environmental cooperation in Asia. One of the success stories of this international cooperation is the capacity building of Surabaya City and implementation of community-based SWM and composting programmes, which has ultimately resulted in reducing the amount of waste sent to landfill by approximately 30% over a five year period. The experience of Surabaya City has been shared and introduced to other cities in Asia with the assistance of JICA and the involvement of other institutions, including KITA and IGES. In this regards, the KitaQ System Composting Seminar is a good opportunity for participants to share good practices, discuss lessons learned and strengthen networking among them. Thus, he encouraged all participants to make use of this opportunity. Further, he advised the participants to learn, not only about SWM and composting, but also some other innovative technologies in Kitakyushu City, such as water and wastewater management, cleaner production and smart communities. Finally, he hoped that participants would enjoy their short stay in Kitakyushu City.

On behalf of the participants, Mr. U. N. Gunasekera, the Mayor of Badulla City, Sri Lanka thanked Kitakyushu City, JICA, IGES, KITA and others for organizing this seminar. He briefly introduced his city, its environmental situation and MSWM issues in Sri Lanka. Further, he gave some examples of Japanese Overseas Development Assistant (ODA) projects in Sri Lanka and explained the long history of international cooperation between the two countries. Finally, he stated that this seminar is very useful for the cities like them with less experience to learn from cities with more experiences in implementing composting projects in their MSWM. Thus, participants would like to work together in strengthening the KitaQ System Composting Network and to achieve its main objectives in achieving a sound material-cycle and low carbon society in Asia.



After the speeches, the Mayor of Kitakyushu City personally met each of the participants to have friendly discussions and exchange of souvenirs. The official event was concluded after a group photo with the Mayor of Kitakyushu City.

### 2.1.2. VISIT TO KITAKYUSHU ENVIRONMENT MUSEUM IN YAHATA

In the afternoon, participants visited the Kitakyushu Environmental Museum in Yahata. At the Kitakyushu Environmental Museum, participants had an opportunity to learn about the environmental history of Kitakyushu city and also time to enjoy the interactive experience that the museum offers to think about what each citizen can do to protect the environment. The participants were particularly interested in learning how Kitakyushu City, which was one of the most polluted industrial cities in Japan, has become one of the environmental model cities of Asia.

With the establishment of Yahata Steelworks in 1901 under the Meiji Administration, Kitakyushu City experienced high economic growth. The city was proud about its achievements in rapid economic growth and its contribution to the economic modernization of the country. However, on the other hand, this rapid industrialization caused problems for environmental and human health. The entire area became polluted and multi-coloured smoke overpowered the sky of the city. Day by day, this situation was getting worst and children often caught sick with asthma.

The first group who truly understood the implications of pollution was mothers and they came together and formed the women's club in 1950 to protect their families. These mothers started to negotiate with the city officials and at the same time, activities were carried out with other professionals to study the issue, document the results and exhibit them for wider awareness raising. As a result of the women's movement, Kitakyushu City established the Commission on Pollution Control Measures in 1964 including the participation of the women's club. Since then, Kitakyushu City and local companies signed the enactment of pollution control pact and worked together to promote pollution control measures. As a result, the city became cleaner and its sky and sea returned their former glittering forms. However, this was not an easy task. It cost both the citizenry and the city government about 800 billion yen over a period of 20 years.

Through this success story, participants learned how the united efforts between the city government, private sector, academic, NGOs and citizens can work together to overcome pollution and achieve sustainable development. Further, participants enjoyed the eco products and new environmental technologies displayed at the museum for educating citizens on how to create a recycling-oriented society.

## WEDNESDAY, 18 JULY

### 2.2. OPENING AND INTRODUCTION TO THE SEMINAR

#### 2.2.1. WELCOMING REMARKS

- Mr. Katsumi Yoshida, Deputy Director General of JICA, KIC
- Mr. Toshikazu Matsuoka, Chief Executive, Kitakyushu Environmental Future City

The seminar officially started with Mr. Katsumi Yoshida, the Deputy Director General of JICA, KIC, welcoming the seminar participants. He gave a brief explanation about the training activities carried out by JICA, particularly in the field of environmental management. He emphasized that environmental management is one of the main focused areas of JICA assistance in developing countries in Asia. The economic growth and rapid urbanization in Asian cities has resulted in increasing the generation of waste to be land filled. JICA has been providing assistance for the establishment of a sustainable waste management system, particularly focusing on capacity development of stakeholders in SWM.



He further highlighted that composting is an effective method to reduce organic waste from the city's waste stream saving larger amount of municipal budget required for waste collection and treatment. In this regards, the achievement made by Kitakyushu City together with KITA and IGES in supporting cities in Asia to reduce organic waste through promoting compost can be easily replicated in other cities. This seminar therefore invited representatives from 13 cities in 5 countries to share good practices and challenges, identify effective strategies, and to develop networking and cooperation among them.

Following the welcome speech of Deputy Director General of JICA, KIC, Mr. Toshikazu Matsuoka, the Chief Executive of Kitakyushu Environmental Future City, also extended a warm welcome to the participants. He briefly explained the history of Kitakyushu City in promoting international cooperation with the Asian countries since the 1980s. To date, more than 6,000 participants have been invited to Kitakyushu City for technical training on environmental issues under a cooperation scheme between JICA and KITA. One of its very successful initiatives was the promotion of composting in Surabaya City. As a result of these community-based composting activities, Surabaya City has been successful in reducing its waste generation by 30%. He also shared information about the Kitakyushu's recent progress in establishing low carbon and smart communities. Finally, he encouraged the participants to relax and enjoy their stay in Kitakyushu City and also to find some free-time to explore the night view of the city.

#### 2.2.2. INTRODUCTORY PRESENTATIONS

- Ms. Eriko Tamura, Director of Training Program Division of JICA, KIC
- Mr. Toshizo Maeda, Deputy Director of IGES, KUC

Ms. Eriko Tamura, the Director of Training Program Division of JICA, KIC gave an introduction to the seminar and elaborated about the JICA training activities held in KIC. She highlighted the fact that there are 46 training programmes accepting about 335 participants annually for environmental management and energy & resources. Among them, waste management techniques and environmental education is one of the popular programmes of the centre's training programmes. She further explained that KitaQ System Composting is now part of the JICA Kyushu's training programmes. During last 7 years (2004-2011) KitaQ System Composting and Takakura Compost Techniques was conducted in 28 training courses and 270 participants were trained from 57 countries. Further, the experiences of Surabaya City were replicated in Sibu (Malaysia), Makassar and Semarang (Indonesia) with assistance from Kitakyushu City, under the technical cooperation project at the grassroots level and also conducted a technical training for the Japan Overseas Cooperation Volunteers (JOCV) before their dispatch to the assigned countries.

Ms. Tamura further explained about the KitaQ System Composting Seminar which was held in Kitakyushu City from 29 June to 01 July 2011, involving 20 participants from 10 cities in 4 countries. At the end of the seminar, participants prepared an action plan for their respective city and agreed to implement after their return. This year's seminar provided an opportunity for these cities to present their progress achieved so far, discuss the existing challenges in implementing community-based composting projects, identify effective strategies and actions to overcome those challenges and facilitate further networking and cooperation among participant cities. However, at the request of JICA country offices and the JOCV local partners, some additional cities are invited to attend this time as new members to the KitaQ Composting Network. She further stated that the seminar included presentations, site visits and observations and discussions among participants. Finally, she requested all participants to actively join the rest of the three-day programme.

Following the introductory presentation of Ms. Tamura, the overview of the current seminar was explained in detail by Mr. Toshizo Maeda, the Deputy Director of IGES, KUC. He highlighted that the number of cities which are effectively manage their solid waste by implementing the KitaQ System Composting has increased during last few years. Thus, the main objective of this seminar is to provide an opportunity for learning from each other (networking) and increasing the membership of KitaQ Composting Network. To be a member of KitaQ Composting Network, cities should setup a waste reduction target (e.g. 10% in 3 years) and report the progress periodically. He further pointed out that this can be an entry point and member cities can gradually head towards establishing low carbon city development, setting some GHG reduction targets (e.g. 10% in 5 years in selected sectors) and reporting the progress to the secretariat. Mr. Maeda further explained how the cities can achieve 10%-20% of waste reduction within three years. The composting plants can receive separated organic waste from different waste generators, such as food industries, vegetable markets, restaurants, retail stores and households. Households can do either composting at source (compost baskets) or bring it to the compost centre. Composting centres require a shredding machine, staff training, and utility fees for daily operation and



management. When the compost is ready, it can be used for city parks, greenery, agricultural farms and gardening. Composting can be a good strategy to replace the use of chemical fertiliser. After that, he gave a detailed explanation about Surabaya's model of composting. He further explained that composting plants need subsidies from city government, which can be funded from the savings achieved by lowering the amount of solid waste overall. He gave some examples from Malaysia, Indonesia and Japan to show how composting projects are implemented in those countries

After the introductory presentations, a video titled on Reducing Waste through Promotion of Organic Waste Composting in Surabaya city, which was produced by JICA, Kitakyushu City, KITA and IGES was shown. It gave an introduction to community-based solid waste management and composting programmes implemented in Surabaya city and shared its experiences in achieving 30% waste reduction through promoting composting with the participation of different stakeholders in the city. This video can be accessed at <<http://jica-net.jica.go.jp/dspace/handle/10410/794>>.

### 2.3. PROGRESS REPORTS BY THE PARTICIPANTS

During this session, the participants who joined the previous year's seminar were requested to present their progress and experiences. Dr. D.G.J.Premakumara, Policy Researcher, IGES facilitated the session. He presented the summary of the action plans prepared by the participant cities at the previous year's (2011) seminar with waste reduction targets and gave some guidelines for their presentations. The participant cities were divided into two groups, including Group A (Indonesia Cities: Balikpapan, Palembang and Tarakan) and Group B (Malaysia: Sibu, Kampar and Philippines: Cebu). Each city was given 10 minutes for the presentation. After all members in each group had completed their presentations, time was allocated for discussion. The city presentations and discussion points are summarized as below.

#### 2.3.1. BALIKPAPAN CITY, INDONESIA

- Mr. Roby Ruswanto, Head of Department of Cleanliness, Landscape and Cemetery, Balikpapan City

Balikpapan City is located in East Kalimantan and covers a total area of 831 sq.km including a land area which is 503 sq.km and a sea area of 328 sq.km. About 85% of the land area is covered with hilly lands and rest of the 15% is flat lands. The total population of the city was 631, 536 in 2011. The waste generation in the city was 505 tonnes per day and more than 60% is organic waste. Mr. Roby explained the city's SWM Strategy which aims to reduce the amount of waste to be land filled by 10% (based on the 2010 data) in the next three years. This included the activities identified at the previous year's workshop, such as the inclusion of environmental education in the school curriculum, the implementation of green, clean, and healthy city program and the creation of Waste Banks. Some of the key points in his presentation are as follows:

- After the previous year's workshop, Balikpapan city enacted a new local regulation, Balikpapan City No.09/2011 for SWM and hygiene service, in addition to its existing laws and ordinances on SWM (the local regulation of Balikpapan city 17/2008 on organizational establishment, local regulation of Balikpapan city no. 10/2004 on waste management survey) to improve the legal system for supporting the community-based solid waste management and composting activities.
- Due to the implementation of community-based waste collection and composting activities, municipal solid waste collection coverage has increased from 70% in 2010 to 84% in 2011. This has resulted in improving hygiene in the neighbourhoods.
- The Department of Cleanliness, Landscape and Cemetery (DKPP) is in charge of the SWM service and it is encouraging citizens to separate waste at source, compost of organic materials and establish waste banks for collecting recyclable materials. It has also built partnerships with local and international agencies for conducting composting and recycling trainings for citizens and its staff as well as awareness raising of the green, clean and healthy city programme.

#### 2.3.2. PALEMBANG CITY, INDONESIA

- Mr. Agoeng Nugroho, Head of Environment Department, Palembang City



The total population of Palembang city is about 1.7 million people with an estimated population growth of 1.8% in 2011. The total land area of the city is about 400 sq. km. which is divided into 16 districts and 107 sub-districts for administrative purposes. The total waste generation of the city is about 750 tonnes per day of which 79% is collected from the residential areas. 62% of the waste is organic and can be easily composted. Mr. Agoeng presented the following key points regarding SWM in Palembang city:

- The city has established a SWM Strategy based on the Eco Friendly Concept.
- The existing waste regulation policies such as the national regulation No.18/2008 on waste management and the local regulation of Palembang city on waste collection provide the legal support for implementing the community-based solid waste management and composting activities.
- The Cleanliness Agency of Palembang City is responsible for SWM and the implementation of the eco-friendly village, school, market, and office
- These programmes aims to increase public awareness to separate waste at source, create a clean and green environment, and increase community participation and investment for environmental management.
- The city has established 5 waste banks after the participation in the previous year seminar to support the creation of an environmentally friendly village. These waste bank programmes has resulted in a reduction in the amount of waste sent to landfill and has also created job opportunities for villagers.
- The city has promoted composting at both the household and neighbourhood level integrating with its eco-friendly village and school programmes.
- The city has identified that in order to successfully implement community-based solid waste management and composting programmes, formulation of SWM policy, provision of facilities and waste management infrastructure to the neighbourhoods, introduction of new technologies, capacity-building for city officials, socialization of waste management policy and award system to evaluate community participation is necessary.
- The city has reported that there is evidence of waste reduction in the pilot neighbourhoods after the introduction of the waste bank and composting, but it is still difficult to calculate the overall waste reduction in the city due to its limited expansion city-wide.

### 2.3.3. TARAKAN CITY, INDONESIA

➤ Ms. Arinda Yuniarsih, Technical Staff of Cleaning Division, Tarakan City

Tarakan City, which has a total population of 239,787 people in 2011, covers an area of 657.33 sq.km. SWM in the city is regulated under the National Regulation No.18 Year 2008 on Waste Management and the Regulation of the Minister of Public Works No. 14/PRT/M/2010 on minimum service standards for public works and the field of spatial planning. The total waste generation in the city is about 570 tonnes per day of which 54% is organic. Ms. Arinda explained that since joining the KitaQ System Composting Seminar in 2011, the city has developed some ambitious targets such as to be the best cleaning agency in Kalimantan by 2014 and the best cleaning agency in Indonesia by 2020. To achieve these long-term missions, some of the key activities being conducted in the City are as follows:

- Introduce waste management with S3R system (sorting, reduce, reuse and recycle) in 2 villages. For the effective waste sorting and collection, city has provided two different types of rubbish bags (organic and non-organic) to these communities.
- Establish 5 composting programmes for management of organic waste. There are three types of composting methods applied in these composting centres, such as Takakura, open windrow and barrel composting methods.
- Expand the waste bank programme in schools (TALING) from seven in 2011 to 20 schools in 2012 in cooperation with the planning, cleansing, environmental, education and development agencies in the city.
- Further, establish one pilot waste bank in Kampung Satu (Satu Village).
- The city has identified that the waste collection coverage has improved from 84% in 2011 to 96% in 2012 and there has also been a 3% total waste reduction to the landfills.



I would like to ask Tarakan city to give more explanation about the TAILING System (Tabungan Lingkungan), particularly its implementation mechanism and the follow up system of this programme.

*A 1: From Tarakan to Mataram*

TAILING programme is very similar to waste bank programme in neighbourhoods. But, it is operated in schools rather than neighbourhoods. This system was initiated with the lessons learned from the Eco-Savers Programme in Marikina City, Philippines. Since 2011 we have introduced this programme to 104 schools. Schools who are interested in implementing this program were required to send us letter of interest, provide land for building the facility, and propose a team to manage the TAILING. Based on the requests, 7 teams from 7 schools have already been trained and established for this programme. Further, we started cooperation with ASTERO (Asosiasi Pengepul Rongsokan) Junkshop to sell waste collected by the students. We also introduce the programme to the school students and their parents to prevent misunderstanding about the actual aim of the programme. Sometimes they thought we were asking them to collect the waste from outside while actually we expect them to bring the waste from their houses. So they will bring the sorted waste to school to be processed in the TAILING Square. The collected waste is to be sold to junkshops and the money is used to buy equipment for the students. We also have a TAILING bus where they can exchange the points they collected from exchanging the waste with money. In this programme there are quite a lot of innovations created by each school adjusted to the needs and challenges they found along the development of their activity. This program has helped quite a lot in training the students and their families to separate waste at source.

*Q 2: From Makassar to Balikpapan*

My question is directed to Mr. Robby from Balikpapan and Mr. Agung from Palembang. I believe that your composting programs are expanding successfully during the last few years. What are the challenges you have faced in implementing these programmes and what benefits you have encountered throughout these years? How does the change of leaders in the city office affect these composting projects?

*A 2.1: From Balikpapan to Makassar*

You are right. There are some influences in the composting project due to the change of the leaders. When our leaders are very supportive for composting programmes, it is easy to implement. But, most important for the success of community-based composting is actually how to change the community mind-set and ensure their continuous participation in the projects.

*A 2.2: From Palembang to Makassar*

In Palembang, we have the local regulations. Even though, leaders are changed, the regulations give some commitment to implement the community-based composting programmes. Further, we have built up a good partnership with private sector, such as with the PUSRI Company. They have supported the city's activities through their Corporate Social Responsibility (CSR) programme. In Palembang, there is usually lack of compost for selling.

*Q 3: From Mr. Maeda, IGES to Palembang and Tarakan*

Quick questions for Palembang, I heard that you are purchasing the compost fertilizer from schools. I have never heard of this from other cities. Do you have an ordinance for this? Do you also have the waste amount data of this purchased compost fertilizer from schools? The same question goes for Tarakan too.

*A 3.1: From Palembang to Mr. Maeda, IGES*

The waste generation in Palembang is 750 tonnes per day. In every school, we have 3 bins for the different types of waste. After the waste is composted, the cleansing agency goes directly to schools to collect the compost. The payment is every 3 months. And from markets, the fruits and vegetable waste is also composted and then the agriculture department collects the products. The agriculture department buy composts from schools to use for city greening.

*A 3.2: From Tarakan to Mr. Maeda, IGES*

So the cleansing department has complete data, but right now I have only the data from 2 schools. You can find it in the beginning of my presentation. These figures are in volume not yet converted to weight figures.

#### 2.3.4. CEBU CITY, PHILIPPINES

➤ Ms. Nida Cabrera, Cebu City Councillor

Cebu city, the second largest in the Philippines has a population of 866,171 with a total land area of 315 sq.km in 2011. The city is divided into 80 barangays (50 urban barangays and 30 rural barangays) for administrative purposes. The main industry is tourism which is growing rapidly as shown by the significant increase in the number of hotels every year. 15% of the city land area is on flat terrain while the rest is uplands which are highly vulnerable to landslides caused by rainfall. The total waste generation in the city was 470 tonnes per day in 2010. With rapid urbanization, economic growth and the need to manage climate change impacts, city has taken some efforts to establish a systematic and



comprehensive ecological solid waste management system. Councillor, Ms. Cabrera explained the key points about SWM in the city:

- Since, 2010, solid waste segregation at source is promoted under the Republic Act (RA) 9003 and the City Ordinance No. 2031.
- The SWM in the city is administered by the Division of SWM of the Department of Public Services. For the effective implementation of the SWM, there are several other offices and organizations are involved, including, office of environment committee headed by Councillor Ms. Cabrera, the City Environmental Sanitation Enforcement Team (CESET), Barangays, NGO, NPO and the private sector.
- The SWM system includes the following processes, such as waste separation at source into four categories (biodegradable, recyclables, special waste and residual), organic waste is composted at both household and community scale, recyclable materials are collected and transported to the material recovery facility (MRF), and residual waste is transported to final disposal site.
- Since 2010, Cebu City has worked with Kitakyushu City and its partners of KITA and IGES in implementing community-based solid waste management and composting programmes, aiming to reduce by 10% waste to be landfilled by 2013 (based on the 2010).
- The city has taken on a number of innovative strategies to support this programme, such as No Segregation No Collection policy in 2011, introducing the segregated waste collection system, the creation of new carder system called Barangay Environmental Officers (BEOs) to enforce environmental laws at the barangay level, monitor proper waste collection and assist the establishment of MRF and composting facilities, financial assistance for barangay proposals to establish MRF and composting, training and capacity building programmes for barangay staff, award system for the best barangay and strengthening the partnerships between private and citizen groups.
- As a result, 58 barangays (72%) has established MRF and composting activities, including vermin compost, takakura method, windrow system and bio-reactors (mechanical composting method)
- Further, city has established a waste-to-energy pilot project with UNEP, Osaka and carried out an extensive study on hazardous waste in the city aiming to develop some local policies and strategies to handle it properly.
- All these initiatives have resulted in reducing the amount of waste to be landfilled by 30% in the last 2 years and has brought many other economic and social benefits to the communities.

#### 2.3.5. SIBU CITY, MALAYSIA

- Ms. Inya Anak Anchai, Assistant Environmental Health Officer, Sibü City

Sibu city, which is located in Central Sarawak, covers an area of 129.2 sq.km with total population of 240,402 people in 2011. SWM is identified as one of the top priority areas to achieve the city's overall mission in delivering quality services through community engagement to achieve sustainable urban development. The total waste generation in Sibü city is 130 tonnes per day (0.65 kg per capita per day). The city spends over RM 5 million annually for SWM, of which 20% is used for landfill operations. The solid waste collection service is privatized and the service coverage is 100% of the total area. Ms. Inya presented some of the key progress points for SWM in Sibü city:

- The waste management practices in Sibü city includes engaging with the communities for recycling, composting, the say no to plastic bags movement and the say no to plastic mineral water bottles movement.
- After the previous year's seminar, Sibü city has established a pilot project for waste separation at source in 3 residential neighbourhoods and a government quarter.
- Further, community compost centre for market waste and Takakura Household Composting in the pilot areas and three schools were established.
- These activities resulted in reducing waste to be landfilled from pilot neighbourhoods. However, still the activities are not scaled-up to see the larger impacts for total waste reduction in the city. Thus, the city identified the importance of taking efforts to scale-up the community-based composting programmes at city-wide in the next phase.

#### 2.3.6. KAMPAR CITY, MALAYSIA

- Mr. Nor Akmal Bin Yang Ghazali, Secretary of Kampar District Council



Kampar City has a 120,000 population and generates 120 tonnes MSW per day. It consists of 100 tonnes of household waste per day and 20 tonnes from business and institutional entities. According to the waste composition, 40% is organic waste which can be easily composted. The SWM is the responsibility of the Urban Services Department. Similar to some other cities in Malaysia, Kampar City aims at fulfilling the national target of achieving 22% recycling rate by 2020. After attending the previous year's KitaQ System Composting Seminar, the city came up with a long-term plan to achieve the national target. According to this long-term action plan, the city has made the following waste recycling targets, such as 9% in 2011, 11% in 2012, 13% in 2013, 14% in 2014 and 15% in 2015. Mr. Nor Akmal presented the progress is achieved so far in implementing the action plan.

- The establishment of compost centre at landfill site as a training centre.
- Replication of household composting from 2 communities in 2011 to 4 communities in 2012.
- Implementation of training for trainers programme to university and school students.
- Networking and dissemination of information with 13 other local authorities in the region.
- Promote My Bag Campaign at shopping malls aiming to reduce plastic bag usage.
- Promotion of a media campaign with the partnership of private institutions.
- As a result, the city has been successful in achieving 10% waste reduction in project areas, reducing the cost for transport and final disposal, reducing the cost for soil conditioner, increasing the recycling rate and community became cleaner and green.
- However, the city has found the following challenges, such as the mind-set and attitudes of the community, a lack of technical capacity, and political support and legal assistance for expanding the pilot experiences at the city-wide level in achieving project sustainability.

#### DISCUSSION SUMMARY 2

*Q 1: From Ms. Andante, IGES to Kampar*

You mentioned buying less soil conditioner as one of the impacts of the composting projects. Do you have any figure of how much is this reduction and if this reduction overcomes the cost of composting itself?

*A 1: From Mr. Akmal, Kampar*

Annually, the budget allocation for buying the soil conditioner is approximately RM 50,000. However, after implementing the composting project, last year we only spent RM 30,000 for buying the soil conditioners which saved RM 20,000 for the city office.

*Q 2: From Dr. Yoshida, JICA to Kampar*

I have a question for Kampar. What are the criteria that you used to select the new communities for the scaling-up of your composting projects?

*A 2: From Kampar*

We have the local agenda committee consisting of government (local councillors), the representatives from the residence organizations and the private sector. This committee held a monthly meeting where we present our intentions to the resident representatives and those who are interested are selected for the replication purposes. Because our experience show that without residents' interest to join the programme, it is very difficult to implement from only the official side. Thus, selection of pilot communities is based on the voluntary basis. Our target this year is to replicate to another 4 housing areas.

*Further Comment: From Dr. Yoshida, JICA*

Thank you for your answer. We have to find the answer for two difficult questions in the rest of the seminar, including how to scale-up and how to sustain the projects. Your answer helped to contribute in finding answers for these questions and we will further discuss these matters in the next sessions.

*Q 3: From Mataram to Sibul and Kampar*

My questions are directed to Ms. Anchai and Mr. Akmal from Malaysia. This is about the day with no plastic programme. Is there any regulation to enforce this programme?

*A 3: From Kampar and Sibul*

The day with no plastic programme is the initiative established by the national government. The local governments are responsible for its implementation. It is not a regulation, but a national policy. According to this programme, people need to bring their own bags for shopping. If they not bring their own bags for shopping, they had to pay for receiving the plastic bags.



*Q 4: From Badulla to all presenters in the group B*

Since most of this no-segregation and no-collection policy in Cebu and the day with no plastic programme in Malaysia are relatively new initiatives. What actions are you took for the ones who violate these ordinance / regulations?

*A 4.1: From Ms. Cabrera, Cebu*

In Cebu, we conducted a series of education and awareness programme for citizens, before introducing the no-segregation and no-collection policy. In response, people have started to cooperate with the regulations we made. However, people do not change immediately. The ones who have violated the law, we started to strictly enforce the penalties and also continue the information and education programme, specially focusing the areas where violations are high.

*A 4.2: From Kampar*

In Kampar, we try to educate people to realize the benefit of using my bag. However, ones who not bring their own bag, they had to pay for receiving the plastic bag.

*Q 5: From Peru to all presenters in the group B*

I want to know how the maintenance and operation costs are born for these community-based solid waste management and composting programmes in your cities. Is this from cities or are the people paying for this programmes? I am asking because this is the main issue for providing the sustainable SWM system in my country. Second, what is the impact of the “no plastic bags” only in designated days? Does not this make people stop shopping on this day and doing shopping on the other days instead? Does it really reduce the amount of plastic bag waste?

*A 5.1: From Sibü*

Yes, in the beginning of the implementation, there were a lot of complaints from the residents and also actually some people avoid shopping on the no-plastic bag day, which is Monday in Sibü City. However, gradually we have also noticed some behavioural changes in the society, such as some people bring their own shopping bags on Monday so they don't have to pay for a 20 cents/bag. Not only citizens, but also some supermarkets also introduced the use of old newspapers for packaging instead of plastic bags.

*A 5.2: From Cebu*

In Cebu, the budget for community-based solid waste management and composting is coming from different sources, such as budget allocation from city office, especially for capital cost and training/capacity building, barangay's budget for operation and management of the community-based programmes, the communities themselves and also the contribution from the private sector. Further, we are drafting the ordinance for no-plastic bags on Saturday. We talked to the plastic retailers and malls are given incentives to introduce this policy. We are also doing information campaigns to recommend people to reduce the plastic bags.

*A 5.3: From Kampar*

In Kampar, the budget for SWM is allocated by the city, which is RM 3.4 million in 2007 and increased to RM 4.7 million in 2010. That is a main reason, why the city wants to achieve waste reduction about 20% by 2020.

## 2.4. PRESENTATION BY THE OBSERVER CITIES

After the progress report presentations by the follow-up six cities, the observer cities were given time to present their experiences in implementing community-based solid waste management and composting programmes in their respective cities. This session was also facilitated by Dr. D.G.J.Premakumara, Researcher, IGES and each city was given five minutes for presentation. Similar to follow-up cities, participant cities were divided into two groups and after the presentations of each group, a time was allocated for discussion. The summary of city presentations and discussion are as follows:

### 2.4.1. GROUP A – INDONESIAN CITIES: MAKASSAR, MATARAM, CIANJUR

- Ms. Baiq Sri Wahyu Hidayati, Environmental Damage and Pollution Control Division Staff, Mataram City
- Mr. Muhammad Jaya, M., Manager of Environment Department Yayasan Peduli Negeri(NGO), Makassar City
- Mr. Tangguh Triprajawan, Head of Bodogol Resort-Mount Gede Pangrango National Park, Cianjur City

Ms. Baiq gave an introduction to the integrated SWM system in Mataram City. The total population in the city is 402,000 and total waste generation is about 150 tonnes per day. In Mataram, there is a controlled



landfill for waste treatment, but the city collects only 71% of the total waste generated and the rest is illegally dumped in open areas and on environmentally sensitive lands. The 3R program, waste bank and composting are introduced at a pilot scale for achieving the Zero Waste Movement. These activities are supported by the private sector through their CSR activities and JICA volunteers. Further, composting is introduced through school programmes and promotes vegetable gardening for increasing the use of compost products. Her presentation concluded by showing the impacts of these waste management activities in improving the environmental condition of Jungkok River which was full of waste in 2008, but looks much cleaner in 2012.

Mr. Muhammad Jaya from Makassar City presented the good practices in implementing community-based solid waste management and composting activities. Mr. Muhammad represents the non-governmental organization (NGO) called Yayasan Peduli Negeri, which has been involved in supporting neighbourhood units (RT) in implementing community-based solid waste management composting programmes since 2008. Under the national and local policies for implementation of 3R, their NGO is actively involved in socialization of the 3R policies at the neighbourhood level. They provided training for neighbourhood groups, awareness programme for citizens, establish community waste collection programmes, promotion of composting, establish waste bank and business creation for recycling, and awarding best neighbourhoods. Finally, he showed photos of some neighbourhoods to explain how these communities changed dramatically towards much cleaner and greener neighbourhoods by promoting a sustainable SWM system.

Mr. Tangguh, the Head of Bodogol Resort-Mount Gede Pangrango National Park presented the issue of SWM in the villages surrounded by the national park. According to his presentation, the national park is located surrounding 23 villages from Bogor, 18 villages from Cianjur and 26 villages from Sukabumi. As most of these villages use the land belonging to the national park for illegal dumping, their office started a SWM programme in collaboration with JICA and the respective cities. The first phase of the project targeted 5 villages from these cities and planned to conduct environmental education, composting and establish waste banks at the neighbourhood level to reduce the amount of waste to be landfilled in the national park. The project is supported by the JICA volunteers and based on this success, his office is interested in scaling up the program into the other villages.

#### DISCUSSION SUMMARY 3

##### *Q 1: From Kampar to Makassar*

I learned that you are doing a lot of projects with community members. What is the method that you are using to approach the community and to be close with them in order to be able to work together?

##### *A 1: From Makassar*

Our approach in working with communities is bottom-up. First, we made a visit to the different districts in Makassar and find the needy communities. During these field visits, we hold activities like games and informal discussions with the residents to make them aware about the issues. Further, we tried to identify the core-groups of people from the communities who have the same interests as us. Then, we encourage them to having discussion with their neighbours and to establish a community-waste collection and recycling programme. After they have taken initial efforts, we provided them training and capacity building support for implementing the programme effectively. We take them to some other best communities in the city or sometimes to the city like Surabaya to learn from their experiences. We also hold competitions between the communities involved in our projects to motivate them. However, we faced some challenges in up-scaling these programmes at city-wide due to minimal support from the local government.

##### *Q 2: From Surabaya to Makassar*

I would like to ask about the local government involvement in your program in Makassar?

##### *A 2: From Makassar*

As I mentioned, the local government involvement is minimal, particularly in the early stage of our projects. We got government support after showing the success of organizing the activity in the community. Sometimes, it took more than four years. After we organized the community to start their own SWM and showing some success in its implementation in the community, the local government is provided some equipment such as the Takakura composting equipment to the community. Further, the communities who participated in the composting program are given priority when selecting administrative assistance. Those who cannot prove their participation by showing waste saving books will have less priority in getting administrative services. These strategies are helpful for motivating communities to involve community-based SWM programme.



*Q 3: From Balikpapan to Makassar*

I have the following three questions for Makassar:

1. What is the budget allocation from the city government
2. What is the amount of waste generation rate (per day / per month/ per year)
3. You have mentioned about community and NGO, but what kind of SWM system the government is providing?

*A 3: From Makassar*

1. I do not have the actual data about the budget allocation of the local government. We never receive any financial support from the local government. Most of our activities are supported by the private sector, particularly Unilever Indonesia under its green and clean programme.
2. According to the data published by the city, the total waste generation in the city is about 600 tonnes per day. We don't know about the accuracy of the data.
3. The local government is responsible for the provision of SWM services. However, their activities are mainly focused on waste collection, transportation and landfill management. No priority for implementation of 3R activities at community-scale.

*Q 4: From Dr. Premakumara, IGES to Makassar*

Do you have any communication with city office to up-scaling the community-based SWM and composting projects? If so, what is their reaction?

*Q 5: From Palembang to Makassar*

I have a similar question. Most of us here are from the government side, I am sure your city also has local regulation on waste management.

*A 4 and 5: From Makassar*

1. Yes, Makassar City also has regulations for SWM. The government is involved in providing solid waste collection services to its citizens. However, SWM is not only the service provided by the government. The government involvement in supporting community initiatives is limited. That's why we are involved in providing community support in the field. Now, the government has asked for our support in other community activities.
2. After observing our progress and impacts at the community level, there is some enthusiasm from the district government. We are now closely work with district government in making a network / association in every district, inviting who are in charge to do the projects with the community.

#### 2.4.2. GROUP B – CITIES FROM PERU, SRI LANKA, MALAYSIA: LIMA, BADULLA, KULIYAPITIYA AND HANG TUAH JAYA,

- Ms. Miriam Arista Alarcón, The Ministry of Environment
- Mr. GUNASEKERA Upali Nishshanka, Mayor of Badulla City
- Mr. ADIKARI MUDIYANSELAGE Lakshman Adikari, Kuliyaipitiya City
- Ms. Noor Azelia Amer, Environmental Control Officer, Research Technology, Construction and Industrial Waste Division, Hang Tuah Jaya

Ms. Miriam Arista from the Ministry of Environment, Peru presented about the SWM situation in Peru. She indicated that population growth, inadequate consumption patterns, migration and trade flows resulted in creating the status of unsustainable SWM in the country. The total population of the country is 2.8 million and generated 17,201 tonnes of solid waste per day. According to the characteristics of the municipal solid waste, 50% of solid waste is organic matter. In Peru, there are several policies to support the separated waste collection and recycling activities. Law No. 27314, General Law on Solid Waste, Article 10 gives power to local authorities to implement separated waste collection programmes. National Environmental Action Plan (PLANAA 2011-2021) sets national targets to achieve 60% recycling and 70% safe disposal by 2017. Additional resources for municipalities to implement the source separation and 3R programmes are provided by the Ministry of Economy and Finance. Further, she explained the SWM implemented with the JICA assistance covering 23 cities in 16 regions. Under this programme, composting is promoted to treat the market waste near to the source. However, this project is still in the planning stage.

Mr. Gunasekera, the Mayor of Badulla city introduced the situation of SWM in his city. Badulla is the provincial capital of Uva Province, about 230 km away from Colombo, the main business city. The total population of the city is about 45,000 and produces 20-25 tonnes of waste per day. The city collects waste from residents and other premises using the house to house collection system without source separation. The city has prepared the SWM policy for implementing the 3R, but not yet implemented due to lack of capacity. He further explained the existing composting programme in the city. With the support of the



Pilisau National Programme and the JICA country office, Badulla city established the central composting plant. Currently, all the organic waste collected in the city is composted. The main problem with the composting plant is bad odour, land disputes with the national government and a lack of technical capacity for the city staff who are involved in the composting programme.

Mr. Adikari, the Mayor of Kuliyaipitiya city presented the SWM in his city. Kuliyaipitiya is a small city with a population of 12,944. The total waste generation in the city is about eight tonnes per day and of which 80% is organic matter that can be easily composted. The waste collection in the city uses the door to door system with bell method and transports it to the central composting plant. Here, the mixed collected waste is separated manually and organic matters are used for composting. Recycling materials are sold to the recycling shops and residual are sent to the final land fill site, which is located next to the composting site. The compost plant uses the open windrow method which takes more than three months to decompose the organic matters. As the city collects mixed waste, the quality of the compost is not good. Thus, the city is planning to do a sorted waste collection to improve the recycling and composting outcome. The JICA volunteer in the city assists in the community education and awareness programme.

Ms. Noor Azelia Amer from the Research Technology, Construction and Industrial Waste Division of Hang Tuah Jaya City presented the SWM in her city. First, she explained briefly about her institution of Solid Waste Management and Public Cleansing Corporation (PPSPPA), which is established in 2008 to enforce laws and regulate the concessionaires for a comprehensive and integrated SWM in the city. After that, she presented the SWM programmes implemented by her institution with the support of Kitakyushu City and JICA. She brought up the fact that Malaysia is one of the first countries to privatize the SWM services including composting. The total population in Hang Tuah Jaya municipality is about 114,732 and generates about 127 tonnes per day. Due to the high composition of food waste (54%), composting is identified as the effective approach in their organic waste management policy. The city has initiated a pilot project, covering four communities and six institutions to encourage waste separation at source and composting organic waste by using the compost basket which called Compost-Chang. Further, they created user information for reference and wider publication materials. The pilot project found success in achieving waste reduction and some other economic and social benefits. However, there are some challenges in introducing household composting city-wide, such as follow-up monitoring and their sustainability.

#### DISCUSSION SUMMARY 4

*Q 1: From Dr. Yoshida, JICA to Hang Tuah Jaya*

I see that in most cases your household composting programmes are either stagnant or have a reduced number of participants involved instead of increasing the number gradually. What is the reason for this?

*A 1: From Hang Tuah Jaya*

Because some of the participants easily gave up whenever they faced some practical issues such as bad odours and allergic reaction to the rice husks.

*Comment from Dr. Yoshida, JICA*

The identification of the success factors of the pilot project is very important before we make some attempts to upscale the programme to other communities. We will talk further about this in the next sessions.

*Q 2: A student from University of Kitakyushu to Peru*

I see that only 33% of users in Peru pay for the waste collection charges. How did this happen and is there any regulation for waste collection charges? Is this situation is limited to Lima or in the entire Peru?

*A 2: From Peru*

This is the average data for Peru. However, when it comes to Lima, the situation is far worse. Only 20% users pay for the service. The users pay for the waste collection service by visiting the city office. However, due to the poor waste collection services they received from the city office, people are less willing to pay.



## 2.5. SITE VISIT TO MERRY CORPORATION AT WAKAMATSU

After the series of presentations and a serious discussion on the community-based SWM and composting practices in each city, the participants visited the Merry Corporation, one of the organic waste recycling company located in the Kitakyushu Eco-Town, to learn about their activities in promoting composting in achieving a sound material cycle society.

Mr. Takaki Matsuo welcomed the participants at his office and guided them to the recycling centre. Here, he explained the Merry System of composting, a mechanical technology of food waste composting introduced by his office. They have introduced a machine, which has specially designed for different capacities (from one tonne to several tonnes per day). The machine can be bought or rent by the users from their company. They will provide the follow-up monitoring and also collect the compost after six months, if users don't want to use the product. This compost is later matured at the company's recycling centre. After being matured, the final product is sold to the farmers who are contracted to produce organic farming. The farmer's product is then collected and sold to the agricultural farms in creating the recycling loop for organic waste management.

According to him, their composting machine is now used by 330 local governments in Japan to recycle food waste equal to 21,000 tonnes per year. In addition to the technology of food waste composting, their company is focused on the technologies of solid waste carbonization and turning plastic and cooking oil into oil. The participants had an opportunity to observe these machines too. However, the participants are very serious about the prices of these composting machines and found that the system is very applicable to their local conditions, even though machine is very costly.

After introduction of the activities, the participants had an opportunity to visit one of the farms located at Haraigawa, which is using the compost product of these machines. At the field, the owner of the farm explained to the participants about the quality and the use of composting in organic farming. He mentioned that the prices are not different from the other products, though they use organic fertilizers. But, there is a now growing demand from customers for the organic products. He found no problem in selling his product, because he gets a regular order from the Mos Burger, a popular burger company for his cabbage.

### THURSDAY, 19 JULY

## 2.6. EXPERIENCES IN ESTABLISHING A SOUND MATERIAL CYCLE SOCIETY: LESSONS LEARNED FROM KITAKYUSHU CITY AND SURABAYA CITY

This session was devoted for sharing the best practices of Kitakyushu City and Surabaya City in achieving sustainable SWM and recycling society through promoting local actions with community groups.

### 2.6.1. MUNICIPAL SOLID WASTE MANAGEMENT AND COMPOSTING ACTIVITIES IN KITAKYUSHU CITY

- Ms. Shizu Tateishi, City of Kitakyushu Environment Bureau. Resource Circulation Division

Ms. Shizu Tateishi from the Kitakyushu city gave a presentation on the experience of SWM in Kitakyushu city. Her presentation included a brief background of the historical development of the SWM system, establishment of 3R activities, reduction of food waste through promotion of composting and future plans in mitigating GHG from waste sector.

She explained that the development of SWM system in Kitakyushu City can be divided into three stages. Stage 1 (before 1993): disposal oriented process, which aimed to introduce safe disposal of waste through promoting incineration facilities. Currently, Kitakyushu city has three incineration facilities to



treat the kitchen garbage and other residuals. Stage 2 (1993-2000): recycling-oriented process, which introduced the waste separation at source into the 12 types and the collection of separated waste with designated plastic bag system. The designated bags need to be bought by the users from the market and this has resulted in reducing the waste to be incinerated by 20% within 10 years. However, since 2000 (stage 3), Kitakyushu City has taken efforts in establishing a sound material cycle society for achieving a sustainable and low carbon society.

In order to achieve low carbon and sustainable society, the city has focused on promoting local efforts to reduce and reuse waste. One of the activities is composting at household and community level to reduce the organic waste to be incinerated. The city has provided free training for the citizens who are interested in doing household composting and provided them home composting tools after successfully attending the training programmes. When the participants started to use the compost basket, they have provided follow-up training and monitoring.

While the number of participants involved in household composting has increased within the last few years, a compost advisor programme was launched to increase the number of advisors who can train and follow-up the composting activities in their neighbourhoods. Overall, there were 108 people in 2010 and this number is increased to 622 people participating in the composting training courses in 2011. In addition the city has started to collect the green waste at community level and compost them with the participation of private companies.

#### DISCUSSIONS SUMMARY 5

##### *Q 1: From Cebu to Kitakyushu*

What happens to people's garbage if they do not place them in the designated bags?

##### *A 1: From Kitakyushu*

This is a rule of waste collection in Kitakyushu City. This type of garbage bags are designated only for the collection of household waste. Industrial waste and other kinds of waste are collected with different system. The key point is, if the people put the waste in the wrong bag, the city does not collect that bag. Instead we put a red label on the bag with a warning to obey the rule in putting the waste out for collection.

##### *Q 2: From Kampar to Kitakyushu*

How do you monitor the quality of the compost products?

##### *A 2: From Kitakyushu*

Once a month, we check the condition and quality of the compost. This monitoring meeting is held in the nearby community centre and all compost users are invited to attend. Here, we do the odour check (bad odour indicates bad quality of the compost). The other parameter is the existence of toxic content. However, most of the time people are using only kitchen waste, therefore usually there is no toxic content found in the compost product. Time to time, we invite experts like Mr. Takakura from JPec Company to do the quality check and give some advices to the users.

##### *Q 3: From Balikpapan to Kitakyushu*

I have the following questions for Kitakyushu City

1. We are interested in the composting courses you are holding to train people to become compost advisors and ask them to further spread the skills to the community. We tried something similar to this in Balikpapan but people do not have incentives if they are not paid, what is your suggestion to overcome this issue?
2. Did you find any difficulties in introducing the waste separation with plastic bags? What and how long does it take until people actually do it correctly?

##### *A 3: From Kitakyushu*

1. The compost advisors are selected by interview. This gives them some reputation for their work and also the opportunity to explain them that their service is voluntary. In this way we select the ones who have high consciousness/awareness regarding the environment and also willingness to give their time for the programme voluntarily. Here in Kitakyushu, we found many people who have high awareness. Even though it is voluntary, there is actually small allowance for their transportation costs. This is because Kitakyushu city is a very wide area, thus, we give some amount of money for covering their transportation costs. However, some participants kindly refuse to accept the transportation costs offered by the city.
2. In the beginning of the socialization of the sorting system, we organized about 1500 briefing/orientation programmes at



the community level with the support of their neighbourhood associations. Further, we trained many volunteers and attached them to the environmental museum for supporting the city office in doing this task. After the series of education programmes, we visited the actual sorting and collection points and trained them on the spot. The neighbourhood association also created core groups who can supervise the collection points and teach the people who need further training on the new waste separation system. This exercise was done continuously 2 weeks after the introduction of the new waste collection system. We found that after 2 weeks, many people are familiar with the new system.

*Q 4: From Hang Tuah Jaya to Kitakyushu*

My questions to Kitakyushu are as follows:

1. For the waste sorting and separation program, did you teach the citizens to separate the whole 12 items which you mentioned in your presentation at once, or did you do it by sections?
2. How many households are involved in doing household composting in the city?
3. Which technology is used to treat the used cooking oil to make biodiesel?
4. What do you do with the construction and demolition waste?

*A 4: From Kitakyushu*

1. The designated waste separation and collection system was introduced in stage-by-stage. At the beginning, we started the programme with separating burnable waste and bulky waste. After that, we introduced for bottles and cans. Next were the plastic bottles, styrofoam and the milk cardboard boxes.
2. The number of households involved in household composting is not exactly known. Although, Kitakyushu City has distributed about 40,000 household baskets so far, we do not know how many people actually practice it in their houses. Additionally, there were private courses in addition to the courses provided by the city government. And also, some people purchased their own electric composter too.
3. I am not exactly sure about the technology to process the cooking oil to biodiesel. About the management of construction and demolition waste, they are in the category of industrial waste, not in the municipal waste. Therefore, the actual treatment is outsourced to contractors. Depending on the type, they are treated differently.

## 2.6.2. EXPANDING THE IMPLEMENTATION OF COMMUNITY-BASED SOLID WASTE MANAGEMENT – KEY SUCCESS FACTORS AND CHALLENGES IN GREEN AND CLEAN PROGRAM IN SURABAYA, INDONESIA

- Dr. Akino Midhany Tahir
- Mr. Gigin Ginanjar, Department of Cleanliness and Landscaping, Division of Landscaping and Public Street Lighting Landscaping Subdivision, Surabaya City

Dr. Akino shared her research finding on the implementation of community-based solid waste management in Surabaya City. Her presentation included a theoretical discussion on sustainable community-based solid waste management, case study analysis of green and clean programme in Surabaya and Jakarta cities and some key findings for designing and scaling-up community-based solid waste management programme.

In her theoretical discussion, she explained the various degrees of citizen participation in SWM, from individual involvement to community management. Community-based waste management encouraged full involvement of the community members in decision making and implementation. Then, she explained the integrated and sustainable SWM, using the three indicators, stakeholders, technical elements and aspects. Based on this sustainable framework, she shows the community-based solid waste management in the case study cities. The stakeholders in the community based solid waste management (CWBM) in Indonesia including the formal and non-formal sectors including the local government, NGO, recyclers, academics, private sectors, waste recycling enterprises. She also addressed the technical, management, financial, and social aspects involved in the waste management.

After the theoretical discussion, she gave a brief introduction to the Green and Clean Programme in Indonesia. It was initiated by the Unilever Peduli Foundation in 2002 as a CSR programme of the Unilever Company in Indonesia. It was first piloted in Surabaya City aiming to reduce the waste to be landfilled through community involvement.

The programme included the following components, encouraging integrated community-based solid waste management system, creating community support system such carders and facilitators, competition and assistance for motivating the community initiatives, and building a multi-stakeholder partnership. Based on the success of Surabaya City, the green and clean programme was later replicated in Jakarta City in 2006 and currently it is practiced by 11 cities in Indonesia.

She identified that the Green and Clean Programme has wider impacts in the pilot communities, in reducing waste, increasing community participation, income generation through improvement of



recycling activities, partnership building. She identified that the programme should be developed and tested at the pilot stage before a consideration of scaling-up. The pilot model should accommodate the technical elements and aspects of the community-based solid waste management system. When the pilot project is successful and gained enough experiences, it can be replicated city-wide. At this stage, it requires some strategy and organizational adjustment for scaling-up. Then, the success in the pilot city can be shared with other interested cities to apply based on their local condition.

Dr. Akino finally wrapped up the presentation by addressing the 5 key factors for a successful community-based waste management system as follows:

- The design of community-based waste management system
- The linkage between the actors who are involved
- Information dissemination
- Policy aspects
- Social participation aspects

After Dr. Akino's presentation, Mr. Gingin from Surabaya City shared the experiences of implementing the community-based solid waste management in Surabaya City. He highlighted that the city had to face a tremendous challenge in SWM after closing the landfill site in Keputih. The only landfill site in Benowo was not sufficient for the overall waste generation in the city. The city has taken several strategic efforts to reduce the waste volume through building community-based solid waste management and 3R system in partnership with various stakeholders, such as community, NGO, private sector, mass media etc. With the support of Unilever and Jawa Post, the city has taken initiative to up-scaling the socialization, environmental carders and assistance for community-based solid waste management programme. At the community, composting is promoted at household and common composting plant, and established waste bank for recycling activities. Further, the city implemented the Surabaya Green and Clean Programme to appreciate the community's efforts in implementing community-based solid waste management programme. As a result, Surabaya City has been successful in achieving a 30% waste reduction during the last six years.

#### DISCUSSIONS SUMMARY 6

##### *Q 1: From Mataram City*

I thought that one of the successes in Surabaya City is the public and private partnership. In Mataram City, we are also aiming to get more involvement from the private sector. We are in a discussion about establishing a system for getting support from one company to one community. Furthermore, we would like to hold a competition among these communities, so that they have motivated to make good use of the CSR fund. This is also related to performing better in the CSR application assessment done by the ministry of environment. In this regard, I would like to learn more about the involvement of Unilever in Surabaya project and also would like to know at which level their involvement is, the district, sub-district level, or the neighbourhood association?

##### *A 1: From Dr. Akino*

The initiative of the green and clean program in Surabaya was started by the Unilever itself. After the programme started doing well in pilot communities, the city has taken efforts to integrate the programme into the city's SWM strategy. But in your case, the city has taken the initiative to invite the private sector into your programme. So these are two different approaches. I think that it is important to have a similar vision between the government and the private sector to work together. You might want to find out which private sectors are interested in being involved. Actually for Unilever, they are interested and took a leading responsibility for addressing the SWM issue in the city.

##### *Q 2: Comments from Dr. Premakumara, IGES*

We have Mr. Gingin from Surabaya city here. I would like to ask him to explain how this partnership between Surabaya City and Unilever was established.

##### *A 2: From Mr. Gingin, Surabaya*

Actually, the programme was first initiated by the private sector, in this case, Unilever. However, the city has a responsibility for providing effective SWM services to its residents, so the city government took a leading role in integrating the private sector programme into the SWM system of the city. The one who actually gave the leadership for this change is the Mayor of Surabaya. Not only Unilever, we strengthened the partnership with many other stakeholders, including the mass media (Jawa Post).

##### *Q 3: From Cebu to Dr. Akino*



What kind of policy in Indonesia allows the private sector to integrate with the local government's programmes? How does the CSR come into this integration?

*A 3: From Dr. Akino*

From my knowledge, Indonesia is the first country, which legalized CSR in 2007. Of course, the CSR activities are different in different kinds of company. For example, the consumer goods company is different than the oil and gas companies. The main incentive given by the government for CSR activities is the reduction of tax that the company has to pay to the government. However, I have no idea on how far this regulation is implemented by the private sector.

*Q 4: Dr. Yoshida, JICA to Cebu*

I understand that you are looking for a new opportunity to collaborate with the private sector. Do you have any good results from these attempts at communicating with them? And what is usually the procedure to develop the collaboration?

*A 4: From Cebu*

Yes, public and private partnerships is one of the main strategies in Cebu city for implementing the community-based SWM and composting programmes. Some of our compost plants are initiated and operated by the private sector. In Cebu, private sector needs to get their business permits and clearance from the respective barangays. One of the mandatory activities for receiving clearance is a report about their environmental plan to the city government in the form of CSR activities. The business sector should implement their program at the community level. The monitoring by the city government may identify if their business activities is or may be integrated in the community level such as their participation in the waste management.

*Comments from Dr. Yoshida, JICA*

So, in Cebu City, the local government plays a role of information provider and coordinator of the implementation of public/private partnerships, but the practice is by the community. This is similar to Surabaya case. But the initiative in Surabaya is from the private sector.

*Q 5: Dr. Yoshida, JICA to Sri Lanka*

Another approach that we heard from yesterday's presentation is the Pilisaru project in Sri Lanka. Both Kuliapitiya and Badulla explained that their composting plants are supported by the national government. Do you have any comments about the government-led approach in this project?

*A 5: From Badulla*

In Sri Lanka, the Pilisaru project is a national government project supported the composting activities carried out by the local governments. There is no participation from NGOs or the private sector. The government provided all the financial and technical assistance for establishing the composting programmes.

*Comment from Dr. Yoshida, JICA*

So, in Sri Lankan case, the public sector participation is sufficient to start the composting programmes and private and NGO participation do not exist?

*Comment from Dr. Premakumara, IGES*

Based on my knowledge, this is right. The active participation of government limited the opportunities for private sector and NGO involvement. However, the government under the Pilisaru project only supports the building and land investment costs. But, there is not much assistance for training, capacity building and operational aspects of the composting process. Thus, experience found that some composting plants failed to achieve their original targets in making compost and marketing them. Therefore the private sector and the NGOs had to be involved in some of the Pilisaru project.

*Q 6: From Dr. Yoshida, JICA to Hang Tuah Jaya*

You introduced to us some of the cases in implementing the community-based composting programmes. Who are doing these projects and who are supporting these projects? What is the commitment of the public side or the private side?

*A 6: From Hang Tuah Jaya*

In Hang Tuah Jaya, the composting projects are completely supported by the government. However, we found some difficulties in these programmes due to the lack of commitment from the community. They expect some quick and easy results. When they realize this is not the case, they tend to give up.

*Comments from Dr. Yoshida, JICA*

Learning from what Mr. Kumara said in the Sri Lankan case, it was the lack of sufficient participation from other sectors that could be the cause of the unsustainability of the project. In the Surabaya case, the design of community-based project supported by the public and private sector partnership was suitable and they created a pilot project. In your case in Hang Tuah Jaya, the balance between design, institutional aspect, information disclosure, policy aspect, and social participation aspect is not optimal. That's why you have faced some challenges in up-scaling.



*Q 7: From Dr. Yoshida to Lima*

From the public sector, you strongly promoted integrated SWM and also composting strategies. Do you have any idea about the design of a pilot project? Who will do it? The national government or the local government?

*A 7: From Lima*

In Lima, the pilot project is designed by the local government and the national government together. The problem in Peru is not only the design. We have small cities which are far away from the main city. Therefore it is not feasible to sell recyclable materials because the process and transportation to the market in the main city is very expensive. But composting is excellent, because it can be used within the city. What is important is to consider all aspects in the design of technology, from production to its marketing. Different cities have different climates and cultures that also need to be considered in the design.

*Comments from Dr. Yoshida, JICA*

From the discussion of designing the programme, I would like to summarize that it is important to mature the pilot project before scaling up.

*Q 8: From Dr. Premakumara, IGES to both presenters*

From the discussion, we found that it is important to have a partnership among public, private and community groups to implement effective SWM and composting system in the cities. This required open and effective systems to share the information among the partners. How did it happen in Surabaya?

*A 8.1: From Mr. Gingin, Surabaya*

Actually the success in Surabaya City is not only due to one partner. It is a collaborative effort of many partners. The local government only supported the initiative taken by other partners. The environment facilitators / leaders are the one who have the main role, and responsibility to make the community understand. That is important to be actively participating in the waste management. We hold some discussion and meeting once a month for facilitators in the sub district level. We also have a meeting once every 6 months at the city level. In this way they can exchange their experience and information about the challenges they face and how to solve them.

*A 8.2: From Dr. Akino*

I agree with what Mr. Gingin explained. The network of facilitators is a good platform for them to upscale the projects because these facilitators are sent to other cities in the country to set up a new project there. These facilitators were not necessarily highly educated people. They participated from the beginning of the project where they knew nothing and continuously learn until they mastered the techniques. This kind of knowledge and experience development gives an increase of confidence as an individual. And this is the kind of incentive that is encouraged in Surabaya.

*Q 9: From Balikpapan to all presenters*

We have visited Surabaya, and since 2008 we have held competitions and implemented the things we learned from Surabaya. However, we see the declining trend of the community participation and interests. From what we learned also from yesterday, is the different attitude and culture of the community in Surabaya and also in Kitakyushu with the community in Balikpapan. The Balikpapan community is not interested with non-financial incentives. Can you give any input or recommendation about this situation? From the Surabaya and Kitakyushu experience, how do we increase the community participation and interests?

*A 9: From Mr. Gingin, Surabaya*

Actually, the Surabaya experiences show that the management was not exactly towards the waste, but towards the people who generate the waste. The key is to change the mind-set of the people. We also had the problem of decreases in participation and interests but the facilitators make a good effort to overcome this problem.

*Comments from Dr. Premakumara, IGES*

I think what is important to note from this discussion is the importance of collaborative action for SWM and composting. Each partner has different capacity and resources. What Surabaya City has done together all those capacities and resources has resulted in expanding the activities throughout the city. Mr. Gingin was saying about changing the mind-set of the community members. However, I found that there should be some changes within the staff and the leaders of the city office for building partnerships with other stakeholders.

*Comments from Kampar*

In my understanding, when the Keputih landfill was closed in 2001, the people in Surabaya City realized that they need to do something. The government said that it was a national problem, therefore both the government and the private sector wanted to take action in this regards. This is similar to the Kitakyushu case, where the environmental damage happened in the 1960's. If they see and they want to change, they will give their full support towards it. If the initiative is only from the government, we tell the people to do composting, we give the trainings, but if they want to change their mind, it will not be successful.



## 2.7. GROUP DISCUSSION: VISIONING EXERCISE FOR IDENTIFYING NECESSARY CAPACITIES FOR PROMOTION OF COMPOSTING IN MSWM

- Dr. Mitsuo Yoshida, Senior Advisor (Environment), JICA
- Dr. D.G.J. Premakumara, Researcher, IGES

From the individual city presentations and follow-up discussions, it was identified that participant cities are different stages of the implementation of community-based SWM and composting programmes. Although Surabaya and Cebu cities are well advanced as well as experienced in implementing the composting programmes city-wide, other cities are in the process of piloting the method in selected households or communities. Only the participant from Peru has no experience in implementing composting programmes yet, but they are also planning to implement a pilot project in Lima under the JICA assistance.

Considering this different level and capacity of the cities, participants were grouped by city and requested to summarize and report the current status of composting programme implementation in their city using the format of city, verification in pilot stage, level of intra-city scaling up, and future target to achieve. The findings are presented in the Table 1 (Follow-up Cities) and table 2 (Observer Cities).

**Table 1: Follow-up Cities**

City	Verification in Pilot Stage	Level of Intra-city Scaling up	Targets
Balikpapan, Indonesia	Yes	Yes (12 sub-districts)	10% (2012) and 20% (2014)
Palembang, Indonesia	Yes	Yes (8 districts), additional 4 districts	10% by 2012 and 20% by 2013
Tarakan, Indonesia	Yes	Yes (7 sub-districts), 1 sub-districts each year	20% by 2014
Kampar, Malaysia	Yes	260 HH in 4 housing area. 400 target in 7 housing area	14% by 2013
Sibu, Malaysia	Yes	1 compost centre, 4 schools and 2 neighbourhoods, other 5 projects.	10-15% by 2013
Cebu, Philippines	Yes	5 barangays, 2 academic. Expand to 13 barangays and 2 academic	Move to 35% by 2013.

**Table 2: Observer Cities**

City	Verification in Pilot Stage	Level of Intra-city Scaling up	Targets
Makassar, Indonesia	Yes	78 neighbourhoods (RW). 5 more neighbourhoods	10% in 2013
Mataram, Indonesia	Yes	10 neighbourhoods (RW). Another 10 neighbourhoods	10% by 2013
Cianjur, Mount Gede Pangrango National Park, Indonesia	Yes	10 HH. Expected to go for 20 HH and 2 schools	5% by 2014
Hang Tuah Jaya, Malaysia	Yes	65 HH in 4 areas, 6 institutions. 3% coverage of whole city by 2013	10% by 2015
Badulla, Sri Lanka	Yes	7 wards. Planned to cover another 8 wards by 2013	10% by 2013
Kuliyapitiya, Sri Lanka	Yes	9 wards centralized plant	10% by 2013
Lima, Peru	No	1 pilot project in a selected city.	5% by 2014



## 2.8. SITE VISITS

### 2.8.1. JPOWER GROUP/JPEC, WAKAMATSU

- Ms. Sayaka Yaoya, Wakamatsu Environment Research Institute, JPOWER group/JPec

At the JPOWER Group/JPec office in Wakamatsu, Ms. Yaoya explained to the participants about the basic methods of using the Takakura composting system. She also elaborated on how to solve the practical problems that emerge during the implementation of composting. As some of the participants have already practiced the Takakura composting method in their cities, she asked them to ready for giving answers for her questions time to time. Key points from her presentation are as follows:

- Microorganisms, moisture control and aerobic conditions are important elements for any composting methods, including Takakura composting.
- Various microorganisms are used during the composting process. Only one kind of microorganism is not enough. The priority of the microorganisms change according to the stage of composting.
- Composting has three stages of transition. Each transition is indicated by the decomposition of different waste categories. The first category is the highly biodegradable waste such as rice, the second category is the high fibre food waste such as the fruit and vegetables and the last one is the lignin containing waste such as the wood.
- The water content for composting materials should be around 40 – 60% to ensure an effective process and good outcome.
- Gather fermentative microorganisms in the local area. This is not only for effective composting but also important for the effective interaction with the local soil.

After the brief presentation, she gave a demonstration to participants on how to cultivate the fermentative microorganisms using locally available foods, how to make seed compost using basic materials (rice bran and rice husk), how to control the water content, how to make a Takakura Household Basket, and how to use the compost to fertilise the plants. Further, the participants had an opportunity to watch a video on Takakura Composting Method.

### 2.8.2. YOSHIHARA FARM

- Ms. Sanae Yoshihara, Yoshihara Farm

After learning about Takakura Composting Method, the participants visited Yoshihara Farm, an organic farm in Wakamatsu, Kitakyushu City. The farm was full of various kinds of fruits and vegetables which are ripe and ready to be harvested such as tomatoes and watermelons. Through communication with Ms. Yoshihara and her teammate working on the farm, participants explored not only the use of organic fertilizers, but also traditional farming methods, such as covering the plants with spiky twigs and scarecrows.

During their discussion, Ms. Yoshihara explained three important points need to be considered in doing organic farming:

- Organic farming is not only for farming without using pesticides, but also a way to enrich the earth from the food.
- Organic farming is a system to manage foods from soil to mouth.
- Organic farming is a system that circulates and sustains life.

Before leaving the Farm, the participants were served watermelons and vegetables harvested from the organic farm.



## 2.9. SITE VISITS

### 2.9.1. HONJO RECYCLING CENTRE, YAHATA NISHIKU

. Participants had an opportunity to visit the Honjo Recycling Centre, one of the two recycling facilities in Kitakyushu which handles household cans and glass, which is located in Yahata Nishiku. This facility was built in 1997 with a capacity of 63 tonnes per a day (two systems of 31.5 tonnes per a day). The facility was established by Kitakyushu City aiming to promote recycling and also for providing decent job opportunities for the handicapped people in the city. Currently, 15 handicapped workers are employed at the centre. It is operated by the NPO with the subsidies received from Kitakyushu City.

After a brief introduction to the centre, the participants observed the process of waste recycling in the plant. The operation of plant is mix of mechanical and labour incentive methods. The trained handicapped staffs separate the materials manually from both sides of the moving belt. The separated waste is sent to the respective recycling companies located in Eco Town for further recycling.

### 2.9.2. WASTE SORTING FACILITY OF BEETLE WASTE MANAGEMENT CO. LTD

After the Honjo Recycling Centre, the participants visited the waste sorting facility of BEETLE Waste Management Company in Yahata Nishiku. The Honjo facility accepts waste collected from the households (municipal waste), the BEETLE recycling factory accepts waste from business establishments (municipal waste). According to the SWM system in Japan, the collection and treatment of household waste (municipal waste) is the responsibility of the local government. The collection and treatment of waste from business establishments and industries is the responsibility of the producers and the respective business establishment or the industry is responsible. If the producers cannot treat its waste in an environmentally friendly manner by themselves, they have to hire a company like BEETLE to do it on their behalf. This situation creates new job opportunities for the private sector. However, participants stated that in most of their cities, all of the waste is collected and treated by the local government and that there is no division between households and business or industries in terms of waste.

At the BEETLE office, participants learned the history of the company and its major activities in the field of waste recycling. It was established in 1972 as a used paper wholesale enterprise and gradually expanded its activities into the treatment of waste paper, plastic crushers, beverage separation, plastic washing and comprising and home appliance recycling. Further, BEETLE developed a bee-net system linking waste treatment and tally sheets across the country online. In addition, they are involved in supporting cities in developing countries to assist in improving the SWM system based on their vast experience in the field of waste recycling.

## 2.10. GROUP DISCUSSION: PREPARATION OF REVISED ACTION PLANS (FOR THE CITIES WHO HAVE JOINED LAST YEAR) AND ACTION PLANS (FOR THE OBSERVER CITIES)

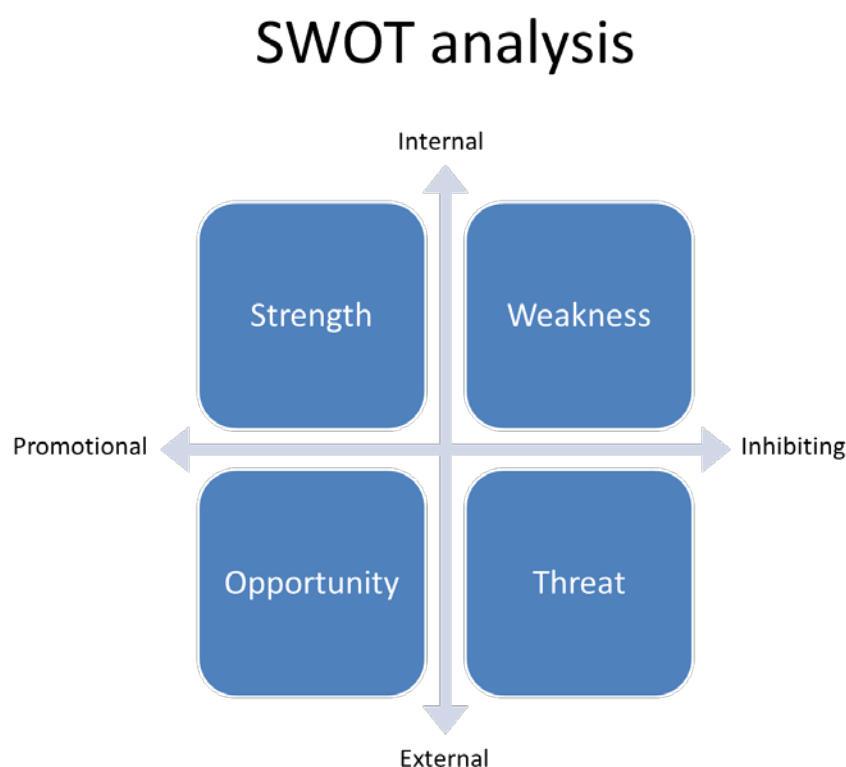
- Dr. Mitsuo Yoshida, Senior Advisor (Environment), JICA
- Dr. D.G.J. Premakumara, Researcher, IGES

After returning from the site visits, participants worked on preparing the action plans for their cities. Dr. Yoshida advised participants to think about the results of the previous day's group discussion. During the visioning exercise in the previous day, each participant identified the status of "verification in pilot



project”, level of intra-city scaling up and “target”. Their summary presentations show that most of cities have verified their pilot project and already started to upscale the project within the city aiming to achieve the proposed targets.

After realizing their targets, participants were advised to identify the promotional (strength and opportunity) and inhibiting (weakness and threats) factors in achieving the proposed targets using a SWOT analysis, shown in figure 1.



**Figure 1:** SWOT Analysis guide

After the participants identified the promotional and inhibiting factors based on the SWOT analysis, they were asked to prepare an action plan by identifying their waste reduction targets, then propose activities to achieve that target and list activities to overcome the weakness and to act against threats. Further, participants were advised to propose a mechanism for monitoring / coordination and identify the external risks which may not be within their scope of authority. These lists of recommended actions are as follows:

**Table 3:** Revised Action Plan of Balikpapan City

<b>Name of City</b>		<b>Balikpapan</b>
<b>Reduction Target</b>		10% by 2012, 20% by 2014
<b>Proposed Activities to achieve the target</b>		•Utilize the all sub-districts have composting facilities. 12 sub-districts
<b>Proposed Weakness</b>	<b>Activities against</b>	•Develop regulation for composting by 2014. Government funded for all the composting activities. This need government support.
<b>Proposed Threat</b>	<b>Activities against</b>	•Education, training, information dissemination, composting education by NGOS, CSR activities by private companies •Utilization of composting in green area
<b>Monitoring/mechanism</b>	<b>coordination</b>	•Monthly monitoring with community organizations
<b>External Risks</b>		•Compost product is not attractive for farmers due to chemical fertilizers (because cheaper) Government will use the compost



**Table 4:** Revised Action Plan of Palembang City

<b>Name of City</b>	<b>Palembang</b>
<b>Reduction Target</b>	10% by 2012 and 20% by 2013
<b>Proposed Activities to achieve the target</b>	<ul style="list-style-type: none"> <li>• Improvement in 3R and composting activities.</li> <li>• Utilization of composting</li> </ul>
<b>Proposed Weakness</b>	<ul style="list-style-type: none"> <li>• Cooperation with other cities and agencies</li> <li>• Training, study visit and capacity building</li> </ul>
<b>Proposed Threat</b>	<ul style="list-style-type: none"> <li>• Cooperation with NGOs, Private sector</li> </ul>
<b>Monitoring/mechanism</b>	<ul style="list-style-type: none"> <li>• coordination</li> <li>• Information dissemination and competition</li> </ul>
<b>External Risks</b>	<ul style="list-style-type: none"> <li>• Urban physical development influenced for composting activities. It may change the location of composting plants and greening areas.</li> </ul>

**Table 5:** Revised Action Plan of Tarakan City

<b>Name of City</b>	<b>Tarakan City</b>
<b>Reduction Target</b>	20% by 2014
<b>Proposed Activities to achieve the target</b>	<ul style="list-style-type: none"> <li>• Segregation at community</li> <li>• Collaboration with agricultural</li> </ul>
<b>Proposed Weakness</b>	<ul style="list-style-type: none"> <li>• Training, capacity building, information management</li> </ul>
<b>Proposed Threat</b>	<ul style="list-style-type: none"> <li>• Encourage community, private sector to regulation</li> </ul>
<b>Monitoring/mechanism</b>	<ul style="list-style-type: none"> <li>• coordination</li> <li>• MRF in once a month</li> <li>• Data in 2 in year</li> </ul>
<b>External Risks</b>	

**Table 6:** Revised Action Plan of Sibu City

<b>Name of City</b>	<b>Sibu</b>
<b>Reduction Target</b>	10-15% by 2013
<b>Proposed Activities to achieve the target</b>	<ul style="list-style-type: none"> <li>• Manage the existing composting plants</li> <li>• Give a free seed compost</li> <li>• To set target on composting coverage</li> </ul>
<b>Proposed Weakness</b>	<ul style="list-style-type: none"> <li>• Ask shedder from other city</li> <li>• Identify a neighborhood association for replication</li> </ul>
<b>Proposed Threat</b>	<ul style="list-style-type: none"> <li>• Enact law for waste segregation</li> <li>• To obligate market to segregate green waste</li> </ul>
<b>Monitoring/mechanism</b>	<ul style="list-style-type: none"> <li>• coordination</li> <li>• Data collection</li> <li>• Monthly meeting at LA21.</li> </ul>
<b>External Risks</b>	<ul style="list-style-type: none"> <li>• Misused of free seed compost (not a risk)</li> </ul>

**Table 7:** Revised Action Plan of Cebu City

<b>Name of City</b>	<b>Cebu</b>
<b>Reduction Target</b>	35% by 2013
<b>Proposed Activities to achieve the target</b>	<ul style="list-style-type: none"> <li>• Award mechanism</li> <li>• BEO programme for door-to door collection of bio waste</li> <li>• Partnership with academia and private sector</li> <li>• Monthly buying of compost by the city</li> <li>• Eco-agri barangay, eco-tourism</li> </ul>
<b>Proposed Weakness</b>	<ul style="list-style-type: none"> <li>• SWM priority projects with barangay, composting, GHG reduction</li> <li>• Incentives for GHG reduction by barangays</li> </ul>
<b>Proposed Threat</b>	
<b>Monitoring/mechanism</b>	<ul style="list-style-type: none"> <li>• coordination</li> <li>• Monthly monitoring meeting with barangay, BEO</li> <li>• Data monitoring</li> </ul>
<b>External Risks</b>	



**Table 8: Revised Action Plan of Kampar City**

Name of City	Kampar, Malaysia
Reduction Target	14% target by the end of 2014 22% target by the end of 2020
Proposed Activities to achieve the target	<ul style="list-style-type: none"> <li>To upgrade compost center at landfill to enlarge the capacity from 5.5 tonnes to approx. 10 tonnes/month</li> <li>To replicate compost activities to other 3 new housing area to achieve accumulated 400 houses in 7 housing area</li> <li>3 kindergarten school for 3R activities</li> <li>To set up 2 oil waste collection center as pilot project</li> </ul>
Proposed activities against weakness	<ul style="list-style-type: none"> <li>To create a specific unit to handle this project</li> <li>To apply to the federal/state government for the budget</li> </ul>
Proposed activities against treat	<ul style="list-style-type: none"> <li>To held more educative activities in order to involve more people and local authorities in CSWM</li> <li>- training, seminar, exhibition via Local Agenda 21 platform</li> </ul>
Monitoring / coordination mechanism	<ul style="list-style-type: none"> <li>Proper data collection</li> <li>Monthly meeting for progress monitoring (Town service department, committee under the LA21)</li> </ul>
External Risk	<ul style="list-style-type: none"> <li>Federation of SWM issue</li> <li>- concentrate handling until further direction</li> </ul>

**Table 9: Action Plan of Makassar City**

Name of City	Makassar
Reduction Target	10% by 2013
Proposed Activities to achieve the target	<ul style="list-style-type: none"> <li>Community green and cleaning in each area</li> <li>Each community get formal certification from city</li> <li>Encourage private sector to involve</li> <li>78 points of RW do composting</li> <li>2 temporary integrated disposal site will be aggregated</li> <li>Central waste bank with Surabaya</li> <li>Training and education center in Makasar</li> <li>Eco-tourism</li> </ul>
Proposed Activities against Weakness	<ul style="list-style-type: none"> <li>Distribute educational tools. Data-base</li> </ul>
Proposed Activities against Threat	<ul style="list-style-type: none"> <li>Commitment from government to not change their policies and decisions taken for supporting composting. (Sign MOU with the city and other stakeholders). Commitment with sub-district</li> </ul>
Monitoring/ coordination mechanism	<ul style="list-style-type: none"> <li>Monthly monitoring. (meet community leaders and waste bank leaders)</li> </ul>
External Risks	

**Table 10: Action Plan of Mataram City**

Name of City	Mataram
Reduction Target	10% by 2013, 29% by 2015
Proposed Activities to achieve the target	<ul style="list-style-type: none"> <li>Meeting with stakeholders</li> <li>SWM role distribution among the stakeholders</li> <li>Foster neighborhoods (waste bank, compost house and organic gardening)</li> <li>Introduce 3R to schools</li> </ul>
Proposed Activities against Weakness	<ul style="list-style-type: none"> <li>Base-line data for waste generation in each RW with academic and NGO</li> </ul>
Proposed Activities against Threat	<ul style="list-style-type: none"> <li>Organization and Capacity building of CBOs through training (10 CBOs by 2013)</li> </ul>
Monitoring/ coordination	<ul style="list-style-type: none"> <li>Monthly reports by RW by baseline data</li> </ul>



<b>mechanism</b>	<ul style="list-style-type: none"> <li>• Quarterly progress meeting</li> </ul>
<b>External Risks</b>	<ul style="list-style-type: none"> <li>• Rotation of the person in charge in the government</li> </ul>

**Table 11:** Action Plan of Cianjur, Mount Gede Pangrango National Park

<b>Name of City</b>	<b>Cianjur, Mount Gede Pangrango National Park</b>
<b>Reduction Target</b>	5% by 2014
<b>Proposed Activities to achieve the target</b>	<ul style="list-style-type: none"> <li>• Partnership with companies under the CSR</li> <li>• Survey of waste in the target areas</li> <li>• Environmental education for schools</li> </ul>
<b>Proposed Weakness</b>	<ul style="list-style-type: none"> <li>• Expand human resources</li> <li>• Ensure Local government support and coordination (invite local government and share information, give training, equipment and tools)</li> </ul>
<b>Proposed Threat</b>	<ul style="list-style-type: none"> <li>• Visit schools regularly</li> </ul>
<b>Monitoring/mechanism</b>	<ul style="list-style-type: none"> <li>• Meeting with stakeholders</li> <li>• Annual report</li> <li>• Data management</li> </ul>
<b>External Risks</b>	<ul style="list-style-type: none"> <li>• How to sell the compost</li> <li>• Location is far</li> </ul>

**Table 12:** Action Plan of Hang Tuah Jaya City

<b>Name of City</b>	<b>Hang Tuah Jaya</b>
<b>Reduction Target</b>	10% by 2015
<b>Proposed Activities to achieve the target</b>	<ul style="list-style-type: none"> <li>• Enforcement</li> <li>• Educate the public on separation</li> <li>• Strengthen the on-going pilot projects</li> <li>• Partnership with private sector</li> <li>• Provide enough infrastructure</li> </ul>
<b>Proposed Weakness</b>	<ul style="list-style-type: none"> <li>• Modify the budget</li> <li>• Staff capacity</li> </ul>
<b>Proposed Threat</b>	<ul style="list-style-type: none"> <li>• Simple and attractive manual for composting</li> <li>• Exhibition, seminar, quality improvement and advertisement</li> </ul>
<b>Monitoring/mechanism</b>	<ul style="list-style-type: none"> <li>• Staff monitoring</li> <li>• Data-base system of users</li> </ul>
<b>External Risks</b>	<ul style="list-style-type: none"> <li>• (Due to halal regulation, compost cannot use for farming)</li> </ul>

**Table 13:** Action Plan of Badulla City

<b>Name of City</b>	<b>Badulla</b>
<b>Reduction Target</b>	10% by 2013
<b>Proposed Activities to achieve the target</b>	<ul style="list-style-type: none"> <li>• Master plan for SWM (government/provincial support)</li> <li>• Establish recycling market</li> <li>• THC</li> </ul>
<b>Proposed Weakness</b>	<ul style="list-style-type: none"> <li>• Strong SWM team, laws and enforcements</li> </ul>
<b>Proposed Threat</b>	<ul style="list-style-type: none"> <li>• Public and private support (no plan)</li> </ul>
<b>Monitoring/mechanism</b>	<ul style="list-style-type: none"> <li>• Regulatory committee and monitoring committee</li> <li>• 4 personal have already trained by JICA will be utilized for monitoring</li> </ul>
<b>External Risks</b>	<ul style="list-style-type: none"> <li>• Government's land use development threats for composting plants</li> </ul>



**Table 14:** Action Plan of Kuliapitiya City

<b>Name of City</b>		<b>Kuliapitiya</b>
<b>Reduction Target</b>		10% by 2013
<b>Proposed Activities to achieve the target</b>		<ul style="list-style-type: none"> <li>• THC</li> <li>• Introduce recycling</li> </ul>
<b>Proposed Weakness</b>	<b>Activities against</b>	<ul style="list-style-type: none"> <li>• Public participation for waste separation at source</li> <li>• Collect organic waste and recyclable materials separately</li> </ul>
<b>Proposed Threat</b>	<b>Activities against</b>	<ul style="list-style-type: none"> <li>• Behavior change among the citizens, environment education and schools</li> </ul>
<b>Monitoring/mechanism</b>	<b>coordination</b>	<ul style="list-style-type: none"> <li>• Monthly meeting with CBOs</li> </ul>
<b>External Risks</b>		

**Table 15:** Action Plan of Lima City

<b>Name of City</b>		<b>Lima</b>
<b>Reduction Target</b>		5% by 2014
<b>Proposed Activities to achieve the target</b>		<ul style="list-style-type: none"> <li>• Organize people group</li> <li>• Define strategic objectives</li> <li>• Project dissemination</li> <li>• Capacity building for local officials</li> <li>• Establish composting plant</li> <li>• Promotional materials</li> <li>• Design advisor system</li> </ul>
<b>Proposed Weakness</b>	<b>Activities against</b>	<ul style="list-style-type: none"> <li>• Prepare guide</li> <li>• Verifications</li> <li>• Project report</li> <li>• indicators</li> </ul>
<b>Proposed Threat</b>	<b>Activities against</b>	<ul style="list-style-type: none"> <li>• Work with material can be sell</li> <li>• Final treatment plan</li> </ul>
<b>Monitoring/mechanism</b>	<b>coordination</b>	<ul style="list-style-type: none"> <li>• Workshop</li> <li>• Monthly progress report</li> </ul>
<b>External Risks</b>		

## 2.11. WRAP-UP AND CLOSING REMARKS

After the action plan presentations, a wrap-up and closing session was started with the remarks of Ms. Cabrera. On behalf of the participants, she expressed her appreciation to Kitakyushu City, JICA, IGES, KITA and others for the organization of the seminar. During the seminar, participants had an opportunity to learn how to integrate the composting programmes into the MSWM system in the city. She stated that looking at the waste composition in the cities, about 50 to 60% are organic waste. Therefore, it is important to treat organic waste, in this case by composting, as an entry point of waste reduction. Furthermore, by promoting waste separation the quality of compost and the economic value of the recyclables could be increased. Good examples from the participating cities such as the MRF and waste bank to promote the recycling of the non-organic waste have been studied as well. In addition, insights into how to build up partnership with private sector, citizen and others in promoting composting have been shared. She also expressed her expectation that all participating cities would implement action plans making full use of knowledge, skills and lessons learned from this seminar.

Dr. Akino expressed her observations as an external participant at both seminars. She observed that many cities have already implemented pilot projects and some are in the beginning stage in terms of scaling up when compared to the previous year, where the cities were only planning to create a pilot project. She hopes that cities are moving towards right direction of improving their SWM system based on community-based composting.



Dr. Yoshida from JICA stated that information is not knowledge and that it is necessary to purify some universal matter among information to get knowledge. He hoped that from the process of exchanging information and the making of action plans, some good knowledge has been harvested.

After that, JICA and IGES presented the follow up plan for this seminar. Ms. Tamura from JICA introduced the new JICA training programme on composting management, which will start from this year. She said that this training programme was designed with IGES and KITA considering the demands of cities in implementing the composting programme and it is going to be continued until 2014. The target countries for this year include Bangladesh, Palestine, Philippines, and Vietnam and the course will start from August to September. If the national governments apply for this training programme, then participants may have the opportunity to join the programme next year.

Dr. Premakumara from IGES stated that as a research institution, IGES would like to work closely with JICA, Kitakyushu City and KITA to monitor progress, document best practices and innovative policies, share the information among participants, develop training materials for capacity building and conduct policy dialogue with the national, regional and international arenas. As an immediate follow-up action to this seminar, a seminar report will be prepared including all presentations and discussion points, which will help inform future activities. Further to this, all action plans will be uploaded to the website in order to facilitate progress monitoring.

After that, Mr. Simon Gilby from IGES gave a brief introduction to the website, designed by the IGES as a comprehensive portal containing all the relevant information from both the 2011 and 2012 seminars. He said that this website will function as a resource for all of the participants and requested feedback. He further stated that the website can be a good opportunity for sharing information globally, citing a previous comment from the Malaysian participants that their initial information concerning the Takakura Method came from the Internet. All participants were encouraged to share any progress or information regarding their activities and achievement with IGES. The address of the website is [www.kitaq-compost.net](http://www.kitaq-compost.net). The participants highly appreciated the idea of establishing a website for sharing information among them. They promised to contribute their materials and progress to the website.

Finally, Mr. Reiji Hitsumoto, Executive Director of International Environmental Strategies Division, Environmental Bureau, Kitakyushu City extended his gratitude to the participating cities for their attendance and active participation in the seminar. He mentioned that Kitakyushu City is glad to see the progress in the replication of the KitaQ System Composting in Asian cities. Further, he expressed hope that the proposed KitaQ Composting Network will provide a space for information sharing and progress monitoring among the participants and concluded his remarks saying that Kitakyushu City welcomes any comments or inquiries from participant cities.

The seminar was finally closed by Dr. Yoshida by representing a “gradually scaling up” motivational Japanese style closing ceremony.



# Concept Note

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## 1. Background

Decentralised, community-based composting is considered as one of the effective approaches for organic waste management, achieving sustainable development and mitigating Green House Gases (GHG) emissions. It can be brought environmental and health benefits to the residents through the appropriate waste collection and treatment at the neighbourhood level. By treating solid waste near to the source, it minimises transportation costs, reduces the amount of wastes for landfills, prolongs the life of landfills, and saves municipal costs for landfill management. It creates new job opportunities and extra incomes for the urban poor and waste pickers. Further, it helps increase the environmental awareness among the community, creates spaces for community involvement and building partnerships at the neighbourhood and city levels.

In this background, the Japan International Cooperation Agency (JICA), Kyushu, Kitakyushu City, the Kitakyushu International Techno-Cooperative Association (KITA), and the Institute for Global Environmental Strategies (IGES) has worked together in introducing the KitaQ System Composting<sup>1</sup>, a model evolved from the experiences of Surabaya's decentralised solid waste management and composting activities in other Asian cities.

While the number of cities, which are involved in applying the KitaQ System Composting into their municipal solid waste management policies and strategies has been increased and JICA Kyushu also has introduced the method in its training programmes for overseas participants and for Japan Overseas Cooperation Volunteers (JOCVs), a networking seminar was organised in Kitakyushu City, during 29 June to 1 July 2011, inviting related cities and organisations to share and discuss their successful experiences and challenge, develop partnership and network. During the seminar, participants made a commitment, set specific waste reduction targets and identified specific actions to implement after they're returned.

## 2. Objectives

The main objectives of the seminar were:

- To provide opportunities to present the progress achieved,
- To discuss existing challenges,
- To identify effective strategies and actions to overcome those challenges and
- To facilitate further networking and cooperation.

## 3. Expected Outcomes

The seminar is expected to achieve the following outcomes:

- The seminar report will be prepared as a set out lessons learned, which can be used by other cities.
- The action plans will be uploaded into the web page of the Kitakyushu Urban Centre (KUC), IGES and

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<sup>1</sup> The KitaQ Compost Project is a waste management project utilizing technology for converting kitchen garbage into compost. This technology, called the Takakura method, was developed by Mr. Takakura at the Wakamatsu Environment Research Institute of JPec Co., Ltd., a J-Power Group company, and this project has been carried out in Surabaya City, Indonesia, since fiscal 2002.

This project is a comprehensive initiative aimed at reducing waste mainly by working with citizens, NPOs, and other parties concerned to compost kitchen garbage from the local community; encouraging sorting of recyclable waste; improving environmental education and other programs to enlighten citizens; and introducing activities to compost garbage from markets. It also makes the most of Kitakyushu City's know-how on waste management administration.



- progress will be monitored periodically.
- The cities with commitment and innovative efforts to achieve the set targets will be identified as model cities and consider for future training and capacity building programmes.

#### 4. Date

July 17 – 20, 2012

#### 5. Venue

JICA, Kyushu International Centre (KIC), Kitakyushu City, Japan

#### 6. Participants

The participants included local government representatives from the following cities:

- (1) Follow-up Cities (6 cities from 3 countries)
  - Indonesia: Balikpapan, Palembang, Tarakan
  - Philippines: Cebu
  - Malaysia: Sibu, Kampar
- (2) New Cities (7 cities from 4 countries)
  - Indonesia: Makassar, Mataram, Cianjur
  - Sri Lanka: Kuliyapitiya, Badulla
  - Malaysia: Hang Tuah Jaya
  - Peru: Lima

#### 7. Programme Outline

Day 1 – Monday, 16 July 2012	
	<ul style="list-style-type: none"> <li>Arrival of Participants</li> </ul>
Day 2 – Tuesday, 17 July 2012	
	<ul style="list-style-type: none"> <li>A courtesy visit to Kitakyushu city office and meeting with the Mayor</li> <li>Visit to Kitakyushu Environmental Museum in Yahata</li> </ul>
Day 3 – Wednesday, 18 July 2012	
Session 1: Opening Session	
09:00 – 09:15	<ul style="list-style-type: none"> <li>Welcoming Remarks:               <ul style="list-style-type: none"> <li>Mr. Katsumi Yoshida, Deputy Director General, JICA, KIC</li> <li>Mr. Toshikazu Matsuoka, Chief Executive, Environmental Future City, Kitakyushu City</li> </ul> </li> </ul>
09:15 – 10:15	<ul style="list-style-type: none"> <li>Introductory Presentations:               <ul style="list-style-type: none"> <li>Introduction to the seminar and JICA training activities, Ms. Tamura Eriko, Director, Training Programme Division, JICA, KIC</li> <li>Kitakyushu Initiative and Replication of Surabaya Solid Waste Management Model in other Asian Cities, Mr. Toshizo Maeda, Act. Director, IGES.</li> <li>A 17 minute video presentation on Reducing Waste through Promotion of Organic Waste Composting, production of JICA, Kitakyushu City, KITA, and IGES-KUC</li> </ul> </li> </ul>
10:15 – 10:30	<i>Tea Break</i>



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**Session 2: Progress Report by the Participants**

*(Cities which have submitted the action plans after the last year seminar in July/August 2011)*

*Facilitator: Dr. D.G.J.Premakumara, Policy Researcher, IGES-KUC*

10:30 – 12:30	<ul style="list-style-type: none"><li>- Group A (Indonesia)<ul style="list-style-type: none"><li>o Palembang</li><li>o Balikpapan</li><li>o Tarakan</li></ul></li><li>- Group B (Malaysia and Philippines)<ul style="list-style-type: none"><li>o Sibul</li><li>o Kampar</li><li>o Cebu</li></ul></li></ul> <p><i>(Each city has 10 minutes for presentation and 10 minutes for Discussion)</i></p>
12:30 – 13:30	<i>Lunch Break</i>
13:30 – 15:30	<ul style="list-style-type: none"><li>- Presentations by new cities joined the programme<ul style="list-style-type: none"><li>o Indonesia<ul style="list-style-type: none"><li>▪ Makassar</li><li>▪ Mataram</li><li>▪ Cianjur</li></ul></li><li>o Malaysia<ul style="list-style-type: none"><li>▪ Hang Tuah Jaya</li></ul></li><li>o Sri Lanka<ul style="list-style-type: none"><li>▪ Badulla</li><li>▪ Kuliapitiya</li></ul></li><li>o Peru<ul style="list-style-type: none"><li>▪ Lima</li></ul></li></ul></li></ul> <p><i>(Each city has 5 minutes for presentation and 5 minutes for Q&amp;A)</i></p>

**Session 3: Site Visit**

15:30 – 16:00	<i>Moving to Merry Corporation at Wakamatsu</i>
16:00 – 17:30	<ul style="list-style-type: none"><li>- Study on the mechanical application in making compost at institutional and residential areas.</li><li>- Site visits to observe the practice of composting in organic farming at Haraigawa.</li></ul>
17:30 – 18:00	<i>Arrival to JICA, KIC</i>
18:00 – 19:30	<b><i>Reception at JICA (JICA Sponsored)</i></b>

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**Day 4 – Thursday, 19 July, 2012****Session 1: Experience sharing**

*Facilitator: Dr. Mitsuo Yoshida, Senior Advisor (Environment), JICA and Dr. D.G.J.Premakumara, Policy Researcher, IGES-KUC*

09:00 – 10:45	- Municipal Solid Waste Management and Composting Activities in Kitakyushu City, Ms. Shizu Tateishi, Resource Circulation Division, Environmental Bureau, Kitakyushu City
10:45 – 11:00	<i>Tea Break</i>
11:00 – 12:30	<ul style="list-style-type: none"><li>- Expanding the implementation of community-based solid waste management: Key success factors and challenges in Green and Clean Programme in Indonesia, Dr. Akino Midhany Tahir, Tokyo Institute of Technology</li><li>- Community-based Solid Waste Management and Composting in Surabaya City, Mr. Gingin Ginanjar, Department of Cleanliness and Landscaping, Surabaya City</li><li>- Discussion.</li></ul>
12:30 – 13:30	<i>Lunch Break</i>



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**Session 2: Group Discussion**

*Facilitator: Dr. Mitsuo Yoshida, Senior Advisor (Environment), JICA and Dr. D.G.J.Premakumara, Policy Researcher, IGES-KUC*

13:30 – 15:00	<ul style="list-style-type: none"><li>- Identify the key outcomes, measures and action areas with quantitative indicators in promoting successful practices:</li><li>- Discussion points:<ul style="list-style-type: none"><li>○ Outputs:<ul style="list-style-type: none"><li>✓ Achievements of any waste reduction targets, environmental, social and economic benefits.</li></ul></li><li>○ Measures and Action Completed:<ul style="list-style-type: none"><li>✓ Awareness raising and environmental education in waste separation at source</li><li>✓ Establishment of composting facility (household, community and institutions) for organic waste and material recovery facility or waste bank for recycling materials</li><li>✓ Partnership building, institutional and policy arrangements</li><li>✓ Any others</li></ul></li></ul></li></ul>
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**Session 3: Site Visit**

15:00 – 15:30	<i>Moving to JPOWER/Jpec, Wakamatsu</i>
15:30 – 16:50	- Technical advice on how to make composting and how to solve the practical problems in making compost, Ms. Sayaka Yaoya, Wakamatsu Environmental Research Institute.
16:50 – 17:00	<i>Moving to Yoshihara Farm</i>
17:00 – 18:00	- Observation of community composting and organic farming. Guide by Ms. Sanae Yoshihara, Circle Farm, Wakamatsu
18:00 – 18:30	<i>Arrival to JICA, KIC</i>

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**Day 5 – Friday, 20 July, 2012**

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**Session 1: Site Visit**

09:00 – 09:30	<i>Moving to Honjo Recycling Center for waste cans and bottles</i>
09:30 – 11:30	<ul style="list-style-type: none"><li>- Observation of bin/can recycling facility in Honjo.</li><li>- Visiting waste sorting facilities of BEETLE Waste Management Co., Ltd.</li></ul>
11:30 – 12:00	<i>Arrival to JICA, KIC</i>
12:00 – 13:00	<i>Lunch Break</i>

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**Session 2: Group Discussion**

*Facilitator: Dr. Mitsuo Yoshida, Senior Advisor (Environment), JICA and Dr. D.G.J.Premakumara, Policy Researcher, IGES-KUC*

13:00 – 15:00	<ul style="list-style-type: none"><li>- Preparation of revised action plans<ul style="list-style-type: none"><li>○ Possibility of replication of the short-term actions at citywide for achieving long-term targets.<ul style="list-style-type: none"><li>✓ Major features that can be replicated</li><li>✓ Required elements for replicating</li><li>✓ Quantitative indicators for monitoring</li></ul></li></ul></li></ul>
15:00 – 15:15	<i>Tea Break</i>
15:15 – 17:00	- Presentation of the revised action plans



17:00 – 17:45	- Discussion on identifying effective mechanisms for follow-up and networking among participant cities. <ul style="list-style-type: none"> <li>○ Launch the KitaQ System Composting Website (<a href="http://www.kitaq-compost.net">www.kitaq-compost.net</a>), Mr. Simon Gilby, Associate Researcher, IGES-KUC</li> </ul>
17:45 – 18:00	<b><i>Wrap-up and Closing Remarks</i></b>
	<ul style="list-style-type: none"> <li>• Dr. Mitsuo Yoshida, Senior Advisor (Environment), JICA</li> <li>• Mr. Reiji Hitsumoto, Executive Director, International Environmental Strategies Division, Environmental Bureau, Kitakyushu City</li> </ul>
18:00 – 20:00	<b><i>Farewell Party at JICA (Kitakyushu City Sponsored)</i></b>

<b>Day 6 – July 21</b>	
	<ul style="list-style-type: none"> <li>▪ Departure of Participants</li> </ul>



## List of Participants

Name	Institution/Position
<b><u>Balikpapan City, Indonesia</u></b>	
Mr. Robi Ruswanto	Head of Cleansing Agency Cleansing Agency, Balikpapan
Mr. Agus Budi Prasetyo	Head of Development Department Development Department, Balikpapan
Mr. Erwin Hardiansuah	Head of Environment Agency Environment Agency, Balikpapan
Ms. Andar Listiani	Head of Local Planning Agency Local Planning Agency, Balikpapan
Mr. Rosin Suparlan	Head of Cooperation Division Cooperation Division, Balikpapan
<b><u>Makassar City, Indonesia</u></b>	
Mr. Muhammad Jaya M	Manager, Environment Department Yayasan Peduli Negeri (NGO), Makassar
<b><u>Palembang City, Indonesia</u></b>	
Mr. (Drs.) Agoeng Noegroho	Head of Environment Department Environment Department, Palembang
<b><u>Tarakan City, Indonesia</u></b>	
Ms. Arinda Yuniarsih	Technical Staff Cleansing Division, Tarakan
<b><u>Mataram City, Indonesia</u></b>	
Ms. Baiq Sri Wahyu Hidayati	Technical Staff Environmental Damage and pollution Control Division, Mataran



**Cianjur City, Indonesia**

Mr. Tangguh Triprajawan	Head of Bodogol Resort Mount Gede Pangrango National Park
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**Hang Tuah Jaya City, Malaysia**

Mr. Roger Tan Kor Mee	Senior Board Director Solid Waste Management and Public Cleansing Corporation Ministry of Housing and Local Government
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Ms. Noor Azelia Amer	Environmental Control Officer Solid Waste Management and Public Cleansing Corporation Ministry of Housing and Local Government
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**Kampar City, Malaysia**

Mr. Nor Akmal Bin Yang Ghazali	Secretary Kampar District Council
Ms. Khairyah bt Abd Halil	Environmental Health Officer Urban Services Department, Kampar District Council

**Sibu City, Malaysia**

Ms. Inya Anak Anchai	Assistant Environmental Health Officer Sibu Municipal Council
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**Cebu City, Philippines**

Ms. Nida Cabrera	City Councilor Environmental Committee, Cebu City
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**Badulla City, Sri Lanka**

Mr. Gunasekera Upali Nishshanka	Mayor Badulla Municipal Council
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**Kuliyapitiya City, Sri Lanka**

Mr. Adikari Mudiyanseelage Lakshman Adikari	Chairman Urban Council, Kuliyapitiya
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**Lima City, Peru**

Ms. Miriam Arista Alarcon	Coordinator, Direccion General de Calidad Ambiental de residuous Solidos
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**Name**

**Institution/Position**

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**Kitakyushu City**

Mr. Matsuoka Toshikazu	Chief Executive, Environment Future City
Mr. Hitsumoto Reiji	Director, International Environmental Strategies Division Environment Bureau
Mr. Naito Hideo	Executive Director, Office for International Environmental Strategies Environment Bureau
Ms. Kubo Seiko	Director, International Environmental Strategies Environment Bureau
Mr. Shigeoka Akinori	Director, Kitakyushu Asian Center for Low Carbon Society International Environmental Strategies Division Environment Bureau
Ms. Ogata Shinichi	Director, Kitakyushu Asian Center for Low Carbon Society International Environmental Strategies Division Environment Bureau
Mr. Oura Takuma	Deputy Director, International Environmental Strategies Division Environment Bureau
Mr. Takeuchi Shinsuke	Manager, Kitakyushu Asian Center for Low Carbon Society International Environmental Strategies Division Environment Bureau
Ms. Morimoto Misuzu	Deputy Director, Kitakyushu Asian Center for Low Carbon Society International Environmental Strategies Division Environment Bureau







	Japan International Cooperation Agency Kyushu International Center
Ms. Ikemoto Tomoko	Training Program Division, Japan International Cooperation Agency Kyushu International Center
Ms. Yokoyama Akiko	Intern, Training Program Division, Japan International Cooperation Agency Kyushu International Center
Dr. Akino M. Tahir	Facilitator
Ms. Harada Yuki	Coordinator/Translator, Japan International Cooperation Center

**IGES (Institute for Global Environmental Strategies)**

Mr. Nakamura Masahiro	Director, Kitakyushu Urban Centre Institute for Global Environmental Strategies
Mr. Maeda Toshizo	Acting Director, Kitakyushu Urban Centre Institute for Global Environmental Strategies
Dr. Premakumara Jagath Dickella Gamaralalage	Researcher, Kitakyushu Urban Centre Institute for Global Environmental Strategies
Ms. Kikusawa Ikuyo	Researcher, Kitakyushu Urban Centre Institute for Global Environmental Strategies
Mr. Higashi Shintaro	Visiting Researcher, Kitakyushu Urban Centre Institute for Global Environmental Strategies
Ms. Teoh Wei Chin	Associate Researcher, Kitakyushu Urban Centre Institute for Global Environmental Strategies
Mr. Simon Gilby	Associate Researcher, Kitakyushu Urban Centre Institute for Global Environmental Strategies
Mr. Hayashi Shiko	Associate Researcher/Sustainable Consumption and Production Group Institute for Global Environmental Strategies
Ms. Andante Hadi Pandyaswargo	Intern, Kitakyushu Urban Centre Institute for Global Environmental Strategies

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## Introduction to

# A Follow-up Seminar of KitaQ System Composting in Asia

Eriko Tamura  
Director of Training Program Division,  
Kyushu International Center (KIC)  
Japan International Cooperation Agency (JICA)

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## Outline

1. Introduction to JICA KIC
  - (1) What is KIC?
  - (2) What does KIC do?
2. Introduction to the Follow-up Seminar
  - (1) Background
  - (2) Purpose
  - (3) Participants
  - (4) Contents



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## 1. Introduction to JICA KIC

### What is KIC? - location

JICA branches in Japan



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## 1. Introduction to JICA KIC

### What does KIC do? (1)

#### Citizen participation programs

- Japan Overseas Cooperation Volunteers (JOCV)
- JICA Partnership Programs

Community-based Solid Waste Management System  
Development Project in Sibu Municipality



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## 1. Introduction to JICA KIC

### What does KIC do? (2)

#### Training programs

- Seeing is believing!
- Focus on Environmental management and energy & resources

Waste Management Technique and Environmental Education



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## 1. Introduction to JICA KIC

### What does KIC do? (3)

Facts of training programs in KIC (as of 2011)

23...	Years old
102...	Countries
165...	Training Programs
864...	Participants

For environmental management and energy & resources...

46...	Training Programs
335...	Participants

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## Background (1)

### Takakura Method

This is a method of compost using locally available fermenting microorganisms. This breaks down organic waste quickly, is a surprisingly simple, and inexpensive method. This method was introduced in Surabaya, Indonesia, in 2004 by Kitakyushu City, KITA and IGES, and has been becoming widely used among 20,000 families within 4 years, reducing the amount of waste by 32%.

### KitaQ Composting Project

This is a grass-roots waste management project utilizing a waste composting technique (Takakura Method) developed by Mr. Takakura, who works at JPOWER/Jpec, a private-sector company in Kitakyushu City. Many citizens and NPOs, etc. are involved in this project to promote the segregation of organic and valuable waste and they conduct environmental education activities to reduce the quantity of waste output.

## Background (2)

### JICA's works



### Kitakyushu's works



## KitaQ System Composting

## Background (3)

JICA Kyushu



(1) Conducted trainings in Japan  
KitaQ method/Takakura method training:  
28 courses (2004-2011)  
270 participants from 37 countries

(2) Implemented technical cooperation at the grass-root level  
• Sibuyan City, Philippines (2010)  
• Makassar City, Indonesia (2009)  
• Semarang City, Indonesia (2006-2007)

(3) Conducted a technical training for JOCV volunteers before their dispatch to the assigned countries  
37 JOCV to 21 countries (2010-)  
"Environmental Ranger News" home page:  
<http://www.jica.go.jp/kyushu/eco/>  
(Japanese only)

(4) Conducted a seminar for JICA staff and volunteers (2011)  
• 120 participants from 9 countries  
• Provided training materials, videos, etc. to 19 countries

(5) Conducted KitaQ Method Compost Project Network Meeting (2011): from Indonesia, Thailand, Philippines and Malaysia  
JICA alumnae, JOCV and technical staff put this on JICA Kyushu's website

(6) Put Q&A on Takakura Method on JICA Kyushu's website (2011)  
• Questions sent to JPOWER/Jpec/Mr. Takakura by JOCV and their answers can be read on JICA Kyushu's website

(7) Made Multimedia Materials "2011"  
"Reducing Waste Through the Promotion of Organic Waste Composting"  
"Takakura Composting Method"

(8) Introduced Takakura Method in Rio +20 (2012)

## Background (4)

A Networking Seminar on KitaQ System Composting in Asia  
(29 June – 01 July 2011)

20 participants from 4 countries, 10 cities



... Follow-up cities

## Purpose

- To provide opportunities to present the progress achieved
- To discuss existing challenges
- To identify effective strategies and actions to overcome those challenges
- To facilitate further networking and cooperation

## Participants

### 1. Follow-up Cities

- Indonesia: Balikpapan, Palembang, Tarakan
- Philippines: Cebu
- Malaysia: Sibuyan, Kampar

### 2. Observers

- Indonesia: Makassar, Mataram, Chianjur
- Malaysia: Hang Tuah Jaya
- Sri Lanka: Badulla, Kuliyaipitiya
- Peru: Lima





## 2. Introduction to the Follow-up Seminar

### Contents

#### 1. Presentations

- By cities (Follow-up Cities / Observers)
- By related organizations
- By experts



#### 2. Site visits and observations

- To farms utilizing compost
- To companies promoting composting
- To waste treatment facilities

#### 3. Discussions among participants

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Thank you very much for your attention!



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# A Follow-up Seminar of KitaQ System Composting in Asia

## Overview

18 July 2012, Kitakyushu

Toshizo Maeda, IGES Kitakyushu Urban Centre

## Objectives

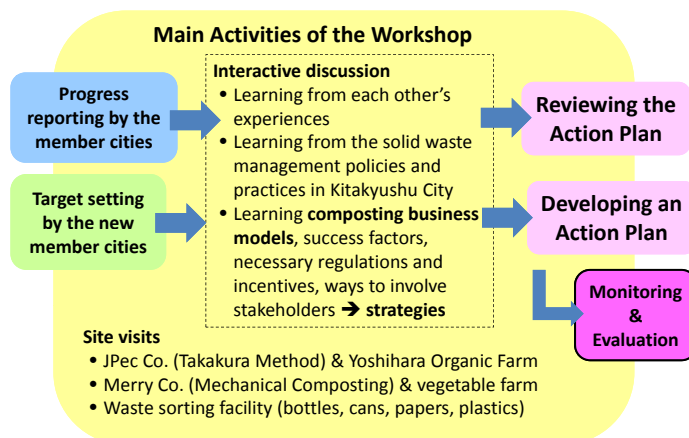
- Increase the number of cities effectively manage solid waste by implementing composting projects
  - ➔ Provide an opportunity for learning from each other (networking)
  - ➔ Increase the members of **KitaQ Composting Network** <http://www.kitaq-compost.net/>
    - Condition: Setting waste reduction target (e.g. 10% in 3 years) and reporting the progress [Entry point]*
  - ➔ Increase the number of cities heading toward **low-carbon city** development [**Environmental City Network in Asia**]
    - Condition: Setting GHG emissions reduction target (e.g. 10% in 5 years in \*\* sectors) and reporting the progress [Advanced]*
- Integration with the [ASEAN ESC Model Cities](#) Programme

## Participants (15 cities from 5 countries)

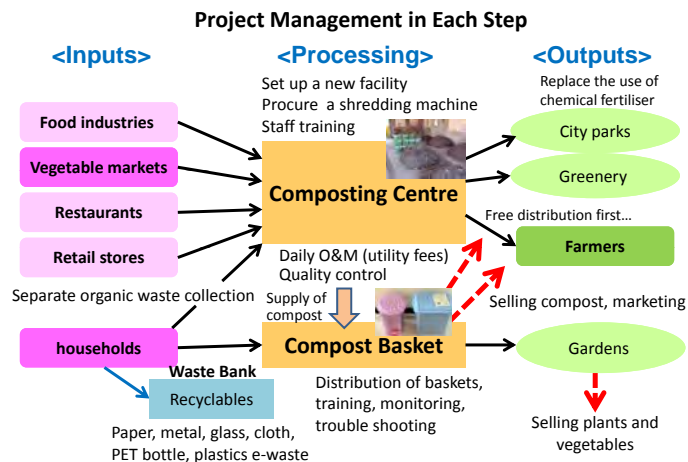
Country	Member Cities	New Cities
Indonesia	Balikpapan, Palembang, Tarakan, Makassar* (Central Jakarta)	Mataram*, Chianjur*
Philippines	Cebu (Bago, Puerto Princesa, Talisay (Negros), San Fernando (La Union))	Mandaue, Sagay*
Malaysia	Sibu (JICA Grassroots Project), Kampar* (Kuching North)	Hang Tuah Jaya (JICA Grassroots Project)
Thailand	(Bangkok (BMA), Nonthaburi, Sri Lacha, Sankanpaen)	
Sri Lanka		Badulla*, Kuliapitiya*
Peru		Lima (JICA Solid Waste Management Project)

\* Counterparts of Japan Overseas Cooperation Volunteers (JOCV)

## Activities & Expected Outputs

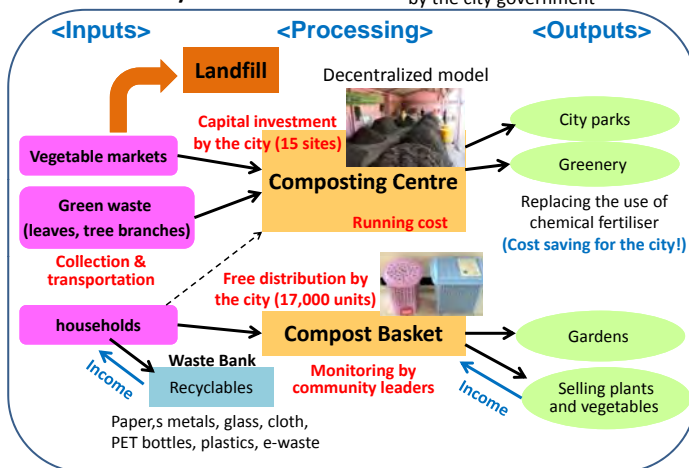


## Strategy to Reduce 10-20% Waste in 3 years



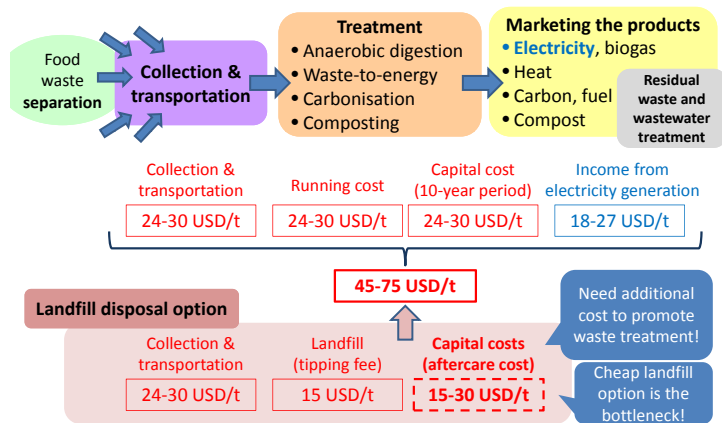
## Surabaya's Model

The whole system is managed by the city government



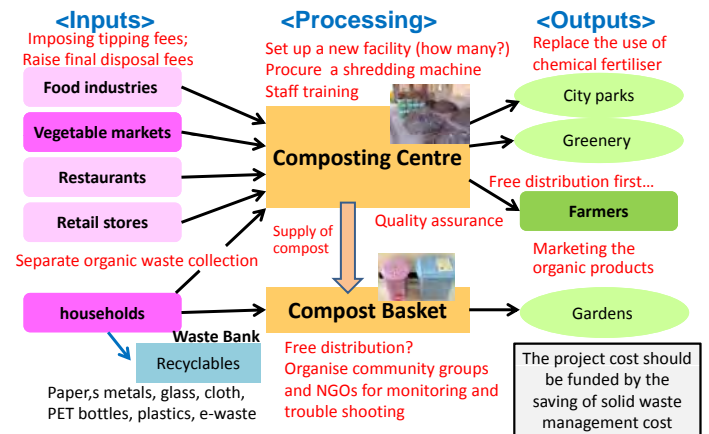


## Ref) Food waste management cost in Malaysia



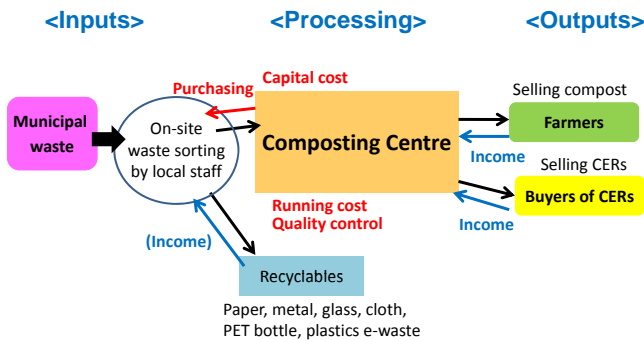
## Strategy to Reduce 10-20% Waste in 3 years

How do you promote composting and waste reduction?

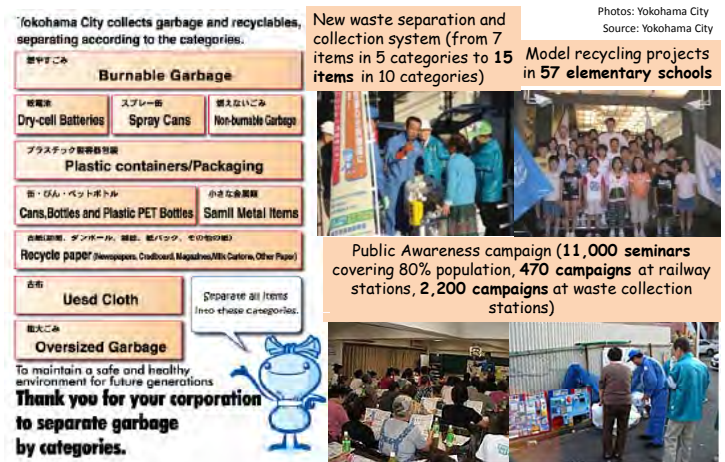


## Gianyar's Model (Indonesia)

Project Management by an NGO (private company)



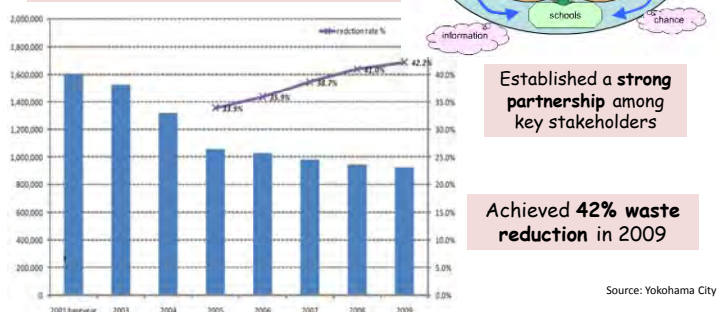
## Waste Reduction and Recycling in Yokohama City – 1



## Waste Reduction and Recycling in Yokohama City - 2

**Achieved economic benefits**

- >US\$1.1 billion in capital costs saved because of two incinerator closures
- >US\$6 million in operating costs saved because of two incinerator closures
- >Life of landfill sites was extended



## Waste Revolution in Nagoya City – 1

Sources & Photos: Nagoya City



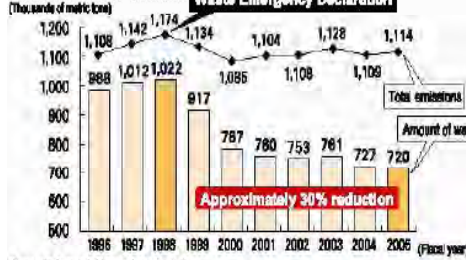


## Waste Revolution in Nagoya City - 2

Source: Nagoya City

Achieved 30% waste reduction within 6 years and increased recyclable waste collection by 2.6 times

Amount of waste and total emissions



Amount of recyclable waste collected

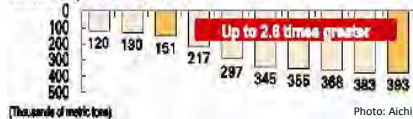


Photo: Aichi, Nagoya

Established a social system for promoting environmentally friendly lifestyles



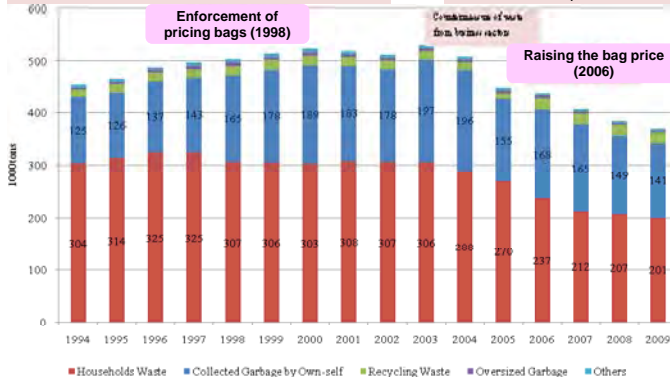
## Solid Waste Management in Kitakyushu City - 1



## Solid Waste Management in Kitakyushu City - 2

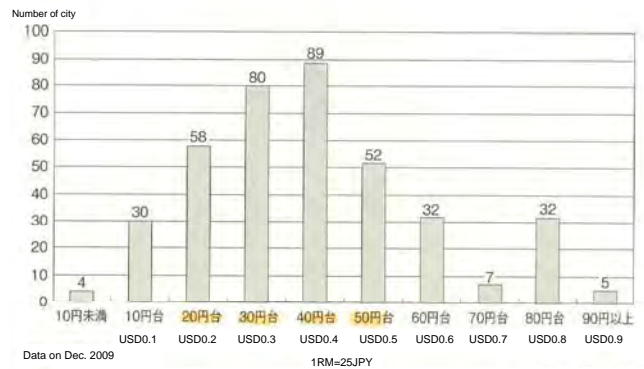
Achieved 27% waste reduction and extended lifetime of the landfill site

Saved waste management cost by 10%



Source: Kitakyushu City

## Ref. Price of garbage bag (40-45L) in Japan



(Source: Shusaku Yamaya, Gomineruka, 2010, p. 39)

## Ref. Waste reduction measures for household waste in Japan

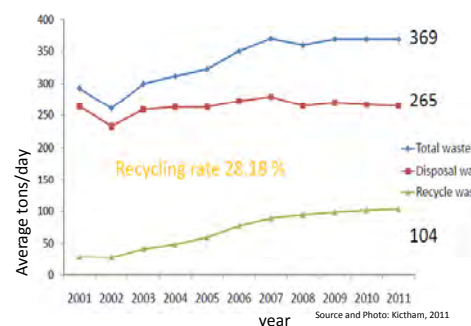
Promoting composting at each household



## Waste reduction and recycling in Nonthaburi, Thailand - 2

Achieved 28% waste reduction to be land filled through mobilizing recycling activities

Improved waste collection service and coverage from 60% - 100%



Created new lifestyles and education on environment





## Establishing a Zero-Waste Society in Minamata City - 1

A small city located in the southern part of Kumamoto Prefecture has a population of 27,000 people (2010) faced some challenges in managing the municipal solid waste after the explosion at the bulk-waste crushing plant in 1992 due to the mixing of propane gas cylinders with other garbage.

Established a vision of becoming an environmental model city in Japan and introduced new waste separation and collection system (from 2 categories to 23)

More than 300 public meetings were organized along with public campaigns in TV, Radio and Newspapers to share information on new waste separation and collection system to the residents



Eco-Town center was established in 2001 for promoting recycling business enterprises



There are 300 stations managed by community members for collection of recyclable materials



The Women's Network for Waste Reduction was established to raise awareness on environmentally friendly lifestyles and promotion of self-monitored ISO

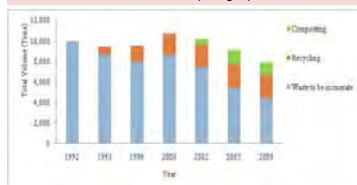


Source: Minamata City

Photo: Minamata City

## Establishing a Zero-Waste Society in Minamata City - 2

Achieved waste reduction by nearly 50% to be incinerated and material recycling by 35%



Created space for community learning and social capital building



Source: Minamata City

The total cost for waste management has increased simultaneously with the city's efforts to increase the recycling ratio and the construction of new incineration facility



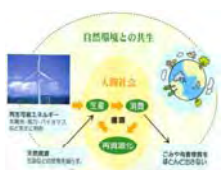
Community earned over 100 million yen from recycling materials and used for improving their environment

Created new lifestyles towards living at one with environment

## Creating a Recycling-based Society in Oki Town - 1

A small agricultural town located in Fukuoka Prefecture has a population of 14,500 people (2010) identified solid waste management as an environmental issue in 1995, due to insufficient capacity in treatment plants, high operational cost, and negative environmental impacts.

Making a vision (*Okimachi Mottainai Declaration*) with active citizen participation



Organized community awareness programme to educate people about new waste separation and collection system



Established biogas system for kitchen waste, human waste and septic tank sludge



Introduced new waste separation and collection system (21 categories at source)



Photo: Oki Town

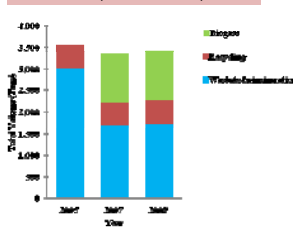
Started to collect kitchen waste separately



Source: Oki Town

## Creating a Recycling-based Society in Oki Town - 2

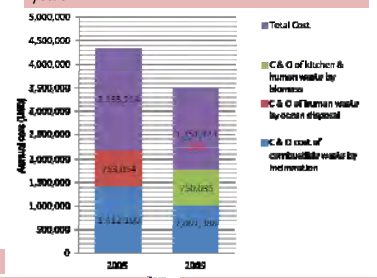
Achieved total waste to be incinerated by 44% within 4 years



Established a new social system and lifestyles



Reduced waste management cost by 20% within 4 years



Source: Oki Town



Photo: Oki Town

## Past Activities in strengthening Network



International Training Workshop for National Policy Framework on Municipal Solid Waste Management in Indonesia, 27-29 October 2010, Kitakyushu City, Japan

Organised by UNESCAP and IGES (in collaboration with Kitakyushu City, KITA, and the JICA, Kyushu)

Participants from national ministries (BAPPENAS, Ministry of Agriculture, KLH, PU, Ministry of Cooperative, Small and Medium Enterprises) and the representatives of local governments (Makassar, Tarakan, Balikpapan, Central Jakarta, Palembang) of the Republic of Indonesia.



A Networking Seminar on KitaQ System Composting in Asia, 29 July - 1 July 2011, Kitakyushu City, Japan

Organised by JICA (in collaboration with Kitakyushu City, KITA and IGES)

Participants from the local governments of Makassar, Tarakan, Balikpapan, Palembang, Surabaya (Indonesia), Cebu (Philippines), Sibul, Kampar (Malaysia) and Nonthaburi (Thailand)

Participants refined the action plans, strengthened the network and came up with the follow-up actions for monitoring

Participants drafted action plans and raised the importance of having a network for information sharing

## Summary Sheet of Follow-up Actions

Name of the City	Balikpapan, Indonesia
Goal for waste reduction	10% waste reduction by 2015 (based on 2011)
Long-term strategies	<ul style="list-style-type: none"> <li>Establish regulation for marketing compost</li> <li>Promoting garden and green spaces in land use planning</li> <li>Collaboration with mining companies for using composting in land filling.</li> </ul>
Short-term actions	
Promote composting at household/ community level	<ul style="list-style-type: none"> <li>Establish a pilot programme for targeting local community</li> </ul>
Establishment of material recovery facility	<ul style="list-style-type: none"> <li>Establish a pilot programme for Trash Bank and 3R Center</li> </ul>
Awareness raising and environmental education	<ul style="list-style-type: none"> <li>Organise 3R training targeting schools (teachers/ students) in the city</li> </ul>
Partnership with other stakeholders	<ul style="list-style-type: none"> <li>Hold meetings with private sector to join the city's programme through CSR</li> </ul>
Policy and institutional	<ul style="list-style-type: none"> <li>Compile relevant Mayor's regulation (PERWALI) and standards for operation</li> </ul>



## Summary Sheet of Follow-up Actions

Name of the City	Palembang, Indonesia
<b>Goal for waste reduction</b>	10% waste reduction by 2015 (based on 2011)
<b>Long-term strategies</b>	<ul style="list-style-type: none"> <li>Strengthen the staff capacity to support community-based composting and 3R promotion</li> <li>Formalise on-going activities in the area of eco-community programme</li> </ul>
<b>Short-term actions</b>	
<b>Promote composting at household/ community level</b>	<ul style="list-style-type: none"> <li>Operation and monitor of pilot programme at 5 neighbourhoods and 6 schools.</li> </ul>
<b>Establishment of material recovery facility</b>	<ul style="list-style-type: none"> <li>Promote Trash Bank through the eco-friendly village concept</li> </ul>
<b>Awareness raising and environmental education</b>	<ul style="list-style-type: none"> <li>Organise training targeting environment carders and school teachers</li> </ul>
<b>Partnership with other stakeholders</b>	<ul style="list-style-type: none"> <li>Strengthen existing partnership with NGOs, private sector and farms</li> </ul>
<b>Policy and institutional</b>	<ul style="list-style-type: none"> <li>Provide capacity building for relevant staff</li> </ul>

## Summary Sheet of Follow-up Actions

Name of the City	Tarakan, Indonesia
<b>Goal for waste reduction</b>	20% - 50% waste reduction by 2015 (based on 2011)
<b>Long-term strategies</b>	<ul style="list-style-type: none"> <li>Promote waste separation at source</li> <li>Promotion of composting for organic waste treatment</li> </ul>
<b>Short-term actions</b>	
<b>Promote composting at household/ community level</b>	<ul style="list-style-type: none"> <li>Establish 5 community-based composting programmes</li> </ul>
<b>Establishment of material recovery facility</b>	<ul style="list-style-type: none"> <li>Establish Trash Bank in those pilot communities</li> </ul>
<b>Awareness raising and environmental education</b>	<ul style="list-style-type: none"> <li>Implement "Tabungan Lingkungan Programme" (TALING) in 16 schools in Adiwiyata</li> </ul>
<b>Partnership with other stakeholders</b>	<ul style="list-style-type: none"> <li>Build partnership with media and academic sector</li> </ul>
<b>Policy and institutional</b>	<ul style="list-style-type: none"> <li>Establish the quality standards for composting</li> <li>Create waste disposal policy</li> </ul>

## Summary Sheet of Follow-up Actions

Name of the City	Sibu, Malaysia
<b>Goal for waste reduction</b>	10% - 15% waste reduction by 2015 (based on 2011)
<b>Long-term strategies</b>	<ul style="list-style-type: none"> <li>Share the experiences with neighbouring cities</li> </ul>
<b>Short-term actions</b>	
<b>Promote composting at household/ community level</b>	<ul style="list-style-type: none"> <li>Manage existing composting plant in collaboration with private company</li> <li>Establish a system for composting the market waste in the city</li> <li>Identify neighbourhoods for replication of composting programmes</li> </ul>
<b>Establishment of material recovery facility</b>	<ul style="list-style-type: none"> <li>Monitor recycling activities in the city through 66 recycling stations (bins)</li> </ul>
<b>Awareness raising and environmental education</b>	<ul style="list-style-type: none"> <li>Education and demoonstartion programme att schools</li> <li>Organise Love Earth Day in April every year.</li> </ul>
<b>Partnership with other stakeholders</b>	<ul style="list-style-type: none"> <li>Partnership with neighbourhood associations</li> </ul>
<b>Policy and institutional</b>	<ul style="list-style-type: none"> <li>Document and share successful experiences with other cities</li> </ul>

## Summary Sheet of Follow-up Actions

Name of the City	Kampar, Malaysia
<b>Goal for waste reduction</b>	22% waste reduction by 2020 (based on 2011)
<b>Long-term strategies</b>	<ul style="list-style-type: none"> <li>Networking and dissemination of information with 13 other local authorities in the area.</li> </ul>
<b>Short-term actions</b>	
<b>Promote composting at household/ community level</b>	<ul style="list-style-type: none"> <li>Establish a compost center at the market</li> <li>Replicate household composting into 2 neighbourhoods</li> </ul>
<b>Establishment of material recovery facility</b>	<ul style="list-style-type: none"> <li>Start operate of composting and recycling center</li> <li>Register existing recyclers in the city and monitor their activities</li> </ul>
<b>Awareness raising and environmental education</b>	<ul style="list-style-type: none"> <li>Implement training of trainers (TOT) programme for university and school teachers/students</li> <li>Organise 3R training targeting schools (teachers/ students) in the city</li> </ul>
<b>Partnership with other stakeholders</b>	<ul style="list-style-type: none"> <li>Establish civil society council to oversee the activities</li> <li>Strengthen partnership with local authorities</li> </ul>
<b>Policy and institutional</b>	<ul style="list-style-type: none"> <li>Policy for integrated environmental planning and management</li> </ul>

## Summary Sheet of Follow-up Actions

Name of the City	Cebu, Philippines
<b>Goal for waste reduction</b>	25% waste reduction by 2015 (based on 2011)
<b>Long-term strategies</b>	<ul style="list-style-type: none"> <li>Establish composting and material recovery facility for each barangay under the RA9003</li> <li>Separated waste collection and band of open dumping</li> </ul>
<b>Short-term actions</b>	
<b>Promote composting at household/ community level</b>	<ul style="list-style-type: none"> <li>Develop composting activities in 6 barangays</li> </ul>
<b>Establishment of material recovery facility</b>	<ul style="list-style-type: none"> <li>Establish the material recovery facility in 10 barangays</li> </ul>
<b>Awareness raising and environmental education</b>	<ul style="list-style-type: none"> <li>Organise training for barangay environmental officers</li> <li>Publish KitaQ manual in local language</li> </ul>
<b>Partnership with other stakeholders</b>	<ul style="list-style-type: none"> <li>Promote composting and material recovery facility in partnership with private sector, NGOs and barangay officials</li> </ul>
<b>Policy and institutional</b>	<ul style="list-style-type: none"> <li>Regulations for separated waste collection and band for open dumping</li> </ul>



## A Follow-up Seminar of KitaQ System Composting in Asia

# Waste Reduction through Composting: Application of Surabaya's Model

18 July 2012, JICA Kyushu  
Toshizo Maeda, IGES Kitakyushu Urban Centre



A Follow-up Seminar of KitaQ System Composting in Asia  
18 July 2012, JICA Kyushu



## A case of Surabaya, Indonesia

[http://www.its.ac.id/mas/middle\\_east\\_and\\_asia/indonesia.pdf](http://www.its.ac.id/mas/middle_east_and_asia/indonesia.pdf)  
Figure-1 Location of Surabaya City and replication of Surabaya's practices in other cities



Population: **3 million**  
2<sup>nd</sup> largest in Indonesia

Environmental cooperation with  
Kitakyushu City since 2001

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## Background

Status in 2001

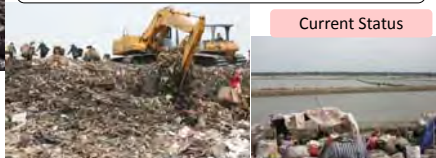


(Photo courtesy of PKK Surabaya)

New **Benowo Landfill**: 800 scavengers; 35km from city centre;  
Surrounded by fish ponds; demand for waste reduction is high

Current Status

Keputih Final disposal site was closed in 2001 due to opposition by residents. Waste filled the streets and drains.



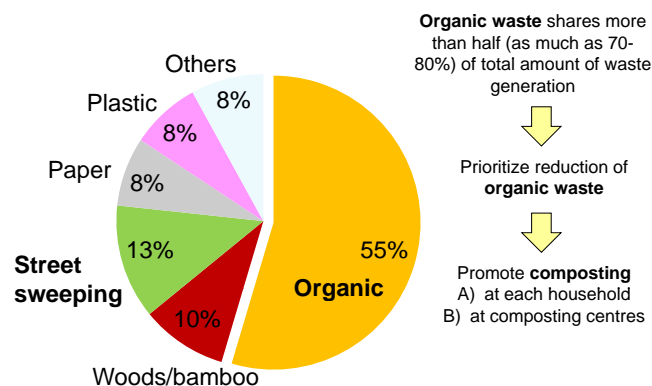
IGES | <http://www.iges.or.jp> | Kitakyushu Asian Center for Low Carbon Society | <http://www.asiangreencamp.net/>

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## Waste Composition in Surabaya



Source: KITA (2002)

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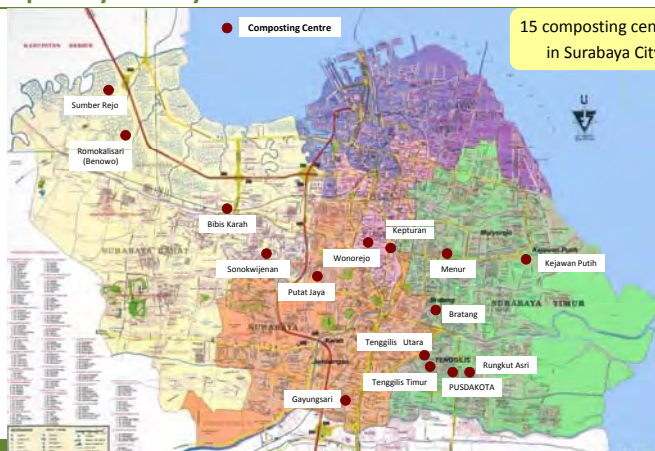
A Follow-up Seminar of KitaQ System Composting in Asia  
18 July 2012, JICA Kyushu



## Inputs by the city

\*Map copied from El Seno, Surabaya, Indonesia  
Figure-7 Location of composting centres in Surabaya

15 composting centres  
in Surabaya City

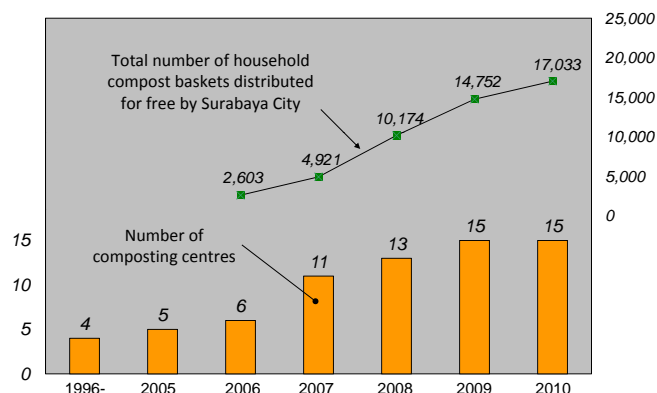


A Follow-up Seminar of KitaQ System Composting in Asia  
18 July 2012, JICA Kyushu



## Inputs by the city

(Data source: Cleansing and Landscaping Dept., Surabaya)



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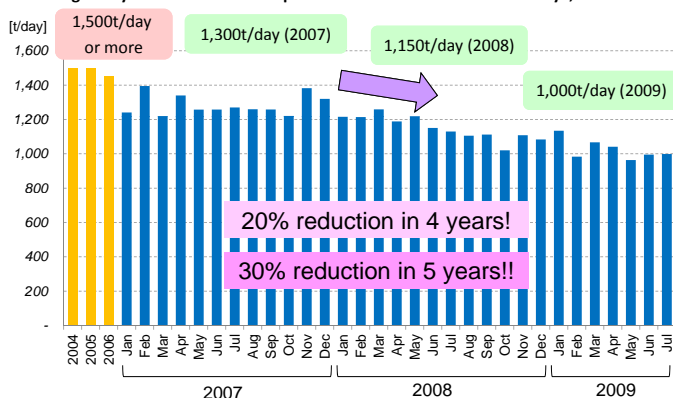
6



## OUTPUT: WASTE REDUCTION

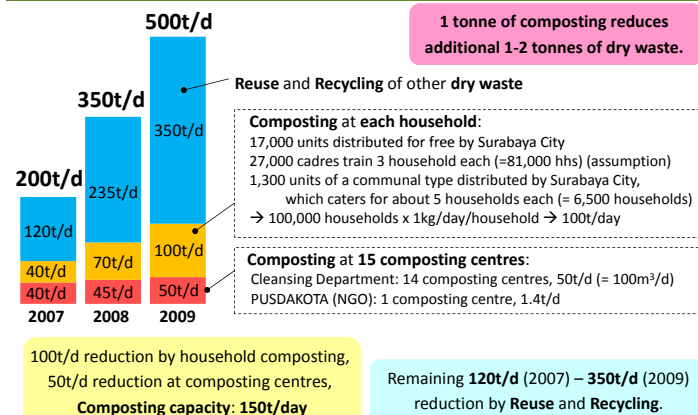
\* Note: Benowo is the only final disposal site in Surabaya City.  
(Data source: Cleansing and Landscaping Department, Surabaya)

Average daily amount of waste disposed at Benowo Landfill\* in Surabaya, 2004-2009



## Output: waste reduction

(Data source: Cleansing and Landscaping Department, Surabaya)



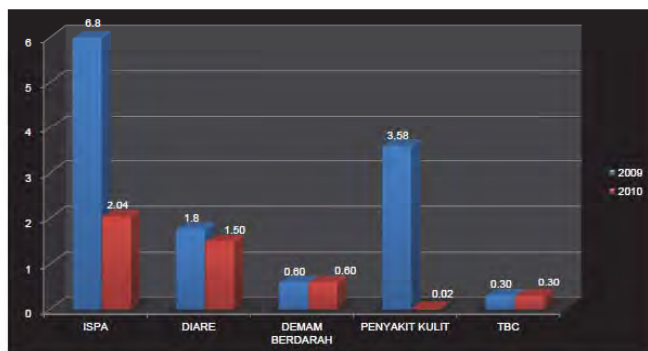
## Social and environmental benefits



## Social and environmental benefits



## CHART OF DISEASE DECREASING IN SURABAYA



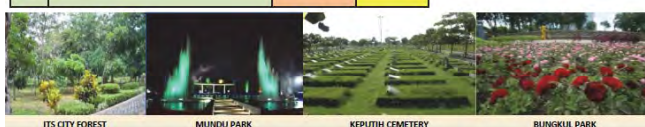
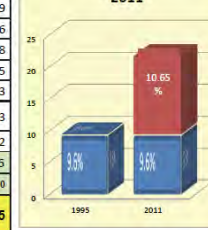
Source : Surabaya City Health Department Data 2010

Cited from Surabaya City's presentation

## OPEN GREEN AREA DEVELOPMENT IN SURABAYA

Num.	Type	Width (Ha)	
		1995	2011
1	Protected area	942,33	4,155,90
2	Park and median	1,535,63	1,864,19
3	City Forest (including zoo)	379,07	41,16
4	Sport field	123,83	220,68
5	Cemetary	191,95	178,45
6	Telaga Open Green Area / reservoir	-	144,33
7	Open green area from social and public facility of housing	-	113,93
8	Open green area of public universities	-	13,32
Total width		3,172,81	6,691,96
Area OF SURABAYA CITY		33,048,00	33,048,00
PERCENTAGE OF OPEN GREEN AREA TO SURABAYA CITY AREA		9.6	20.25

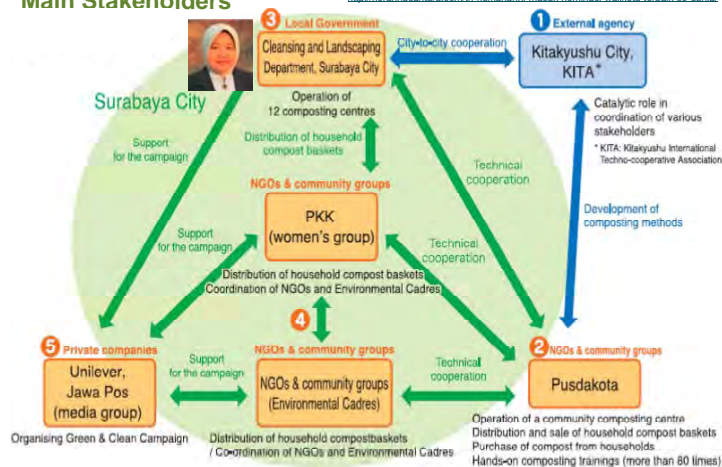
### OPEN GREEN AREA COMPARISON 1995 and 2011





## Main Stakeholders

Photo source:  
<http://koranpusanara.com/ri-rismaharini-masuk-nominasi-walkota-terbaik-se-dunia/>



## Surabaya's successful solid waste management model

### Step 1.

### Development of a model community, from 2004 to 2006:

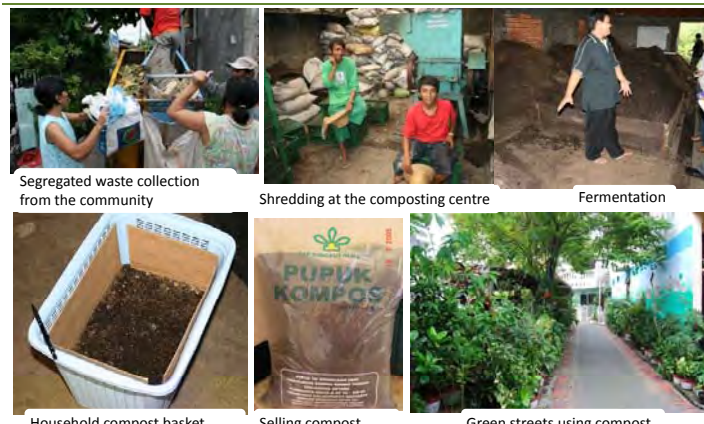
Cooperation between Kitakyushu International Techno-cooperative Agency (KITA) and Pusdakota (a local NGO),

## Starting a model project

(photo courtesy of KITA)



## Development of a model community (Pusdakota (NGO)'s activity)



## Achievements by KITA's intervention

(photo courtesy of KITA)



PUSDAKOTA's compost centre: before and after KITA's intervention

## Surabaya's successful solid waste management model

### Step 2.

### Scaling up the model project by the City Government, from 2005 – 2011:

- Setting up composting centres
- Distributing compost baskets to residents



## Composting and its positive impacts in Surabaya

(Photos cited from "Sparkling Parks in Surabaya", Cleansing Department, Surabaya City, 2008)



Parks became greener using compost



Streets became greener using compost



Bratang Composting Centre



Sonokwijenan Composting Centre



Keputran Composting Centre

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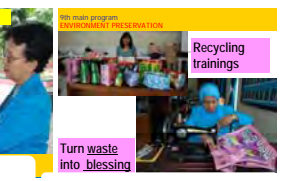
## Activities of PKK (a women's group) and Environmental Cadres



Waste segregation training



Explaining how to use compost baskets



Manufacturing bags from waste



Meeting of Environmental Cadres



Activities of Environmental Cadres



Environmental Event

(Photo courtesy of PKK Surabaya (top row) and Environmental Cadre of Tegalsari, Surabaya (bottom row))

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## Surabaya's successful solid waste management model

### Step 3.

### Organising a community clean-up campaign, from 2005 – 2011:

- Cooperation with NGOs, private companies and the media
- Successful involvement of citizens in the waste management activities

IGES | <http://www.iges.or.jp>

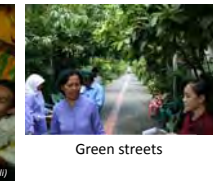
Kitakyushu Asian Center for Low Carbon Society | <http://www.asiangreencamp.net/>

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## Community and Private Sector Involvement



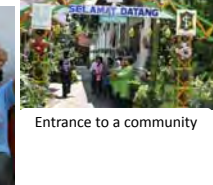
Award winning community



Green streets



Campaign sponsors



Entrance to a community



Products made from waste

Award winning housewives group

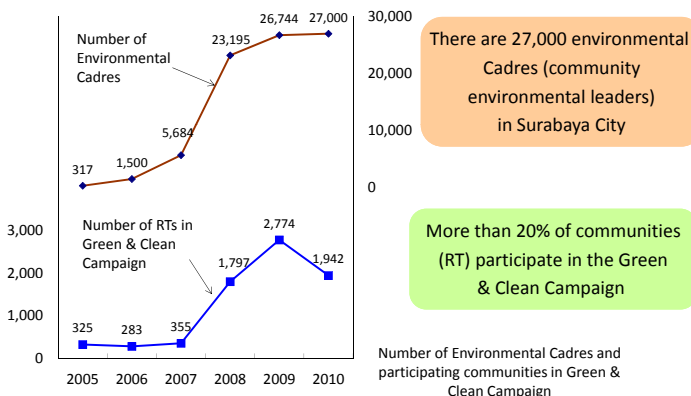
IGES | <http://www.iges.or.jp>

Kitakyushu Asian Center for Low Carbon Society | <http://www.asiangreencamp.net/>

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## Community Environmental Leaders (Cadres)

Source: Surabaya City



IGES | <http://www.iges.or.jp>

Kitakyushu Asian Center for Low Carbon Society | <http://www.asiangreencamp.net/>

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## Surabaya's successful solid waste management model

### Efficient Composting Method

- High productivity (within 2 weeks)
  - Using only local materials
- No offensive smell, no leachate
- Fast, cheap and good quality!

IGES | <http://www.iges.or.jp>

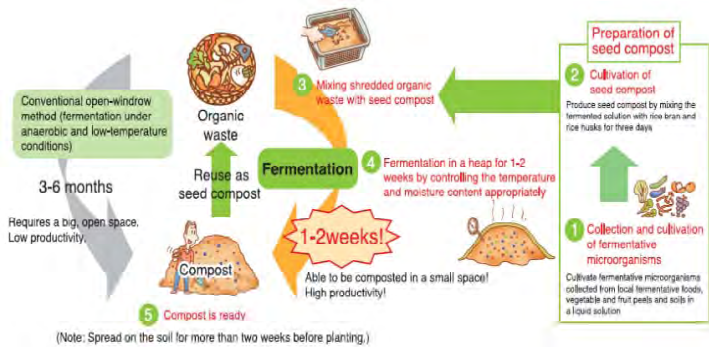
Kitakyushu Asian Center for Low Carbon Society | <http://www.asiangreencamp.net/>

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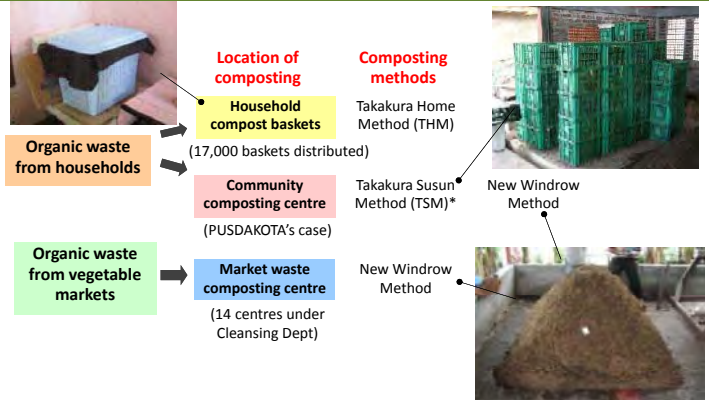
## COMPOSTING METHODS

Figure 8 Operational flow of Takakura Composting Method  
(Prepared by Maeda (2008) with technical supervision by Kouji Takakura, JPEC Co., Ltd.)



- Features:**
1. **Fast** and less space requirement
  2. No foul smell (not rotting)
  3. **Low-cost, low-tech** and easy operation
  4. Using **only local materials**
  5. Active microorganism in compost enriches the soil

## Composting Options



### Types of composting options in Surabaya

## Surabaya's successful solid waste management model

### Financial Analysis of Composting Practices

- Is composting financially sustainable?

## Costs of composting promotion

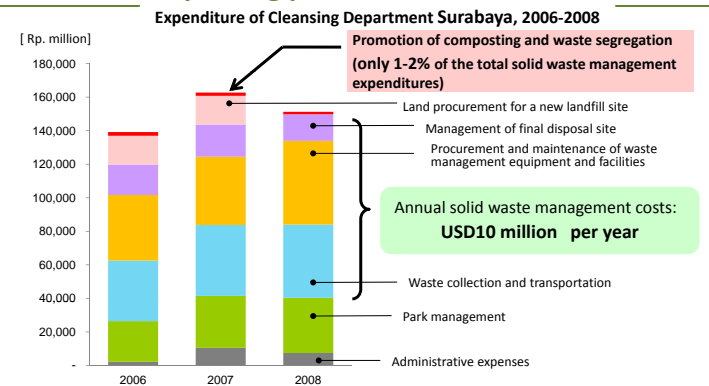
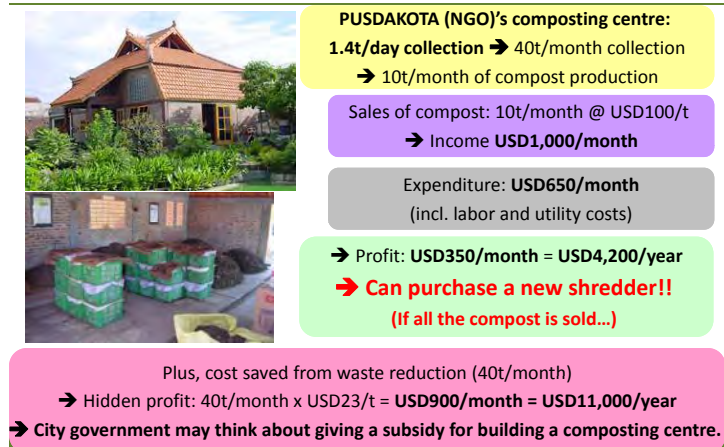


Figure 5 Annual expenditures of Cleansing and Landscaping Department, Surabaya, 2006-2008  
(Data source: City Development Planning Department (BAPPENKOT) Cleansing and Landscaping Department, Surabaya; prepared by Maeda (2009))

## How much is the solid waste management cost per tonne?



## Is operation of a composting centre financially sustainable?





## How much did the city save by reducing waste?



Composting centre

**14 composting centres in Surabaya City:**  
Composting 50 t/day = 1,500 t/month

Compost production: 300t/month (20% of input)  
→ Replacing the purchase of soil conditioners  
300t/m x USD20/t = USD6,000/month



Soil conditioners

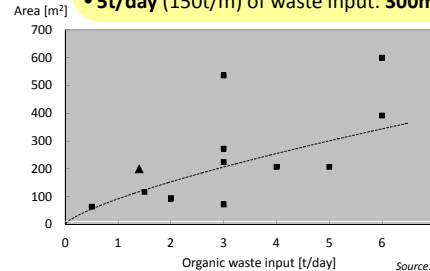
PLUS, cost saved from waste reduction:  
1,500t/month x USD23/t  
= USD34,000/month

→ Profit: USD40,000/month  
= USD48,000/year

## How much space is required for a composting centre?

**Necessary space for a composting centre (incl. the office space):**

- 1t/day (30t/m) of waste input: 100m<sup>2</sup> → Compost production: 6t/m (Income: USD600/month)
- 3t/day (90t/m) of waste input: 200m<sup>2</sup> → 18t/m (USD1,800/m)
- 5t/day (150t/m) of waste input: 300m<sup>2</sup> → 30t/m (USD3,000/m)



Composting Centre is operational in a small space!

Fig. Area of composting centres and Amount of processed organic waste in Surabaya

Source: Cleansing and Landscaping Department Surabaya

## Does free distribution of compost baskets make business sense?

**Distribution of household compost baskets in Surabaya:**

- 17,000 units distributed for free by the city in 5 years
- Distribution cost: USD10/basket x 17,000 = USD170,000
- Campaign cost: USD10/basket x 17,000 = USD170,000
- Total cost: **USD340,000**

**Benefit:**

- Waste reduction: 17t/day (= 17,000 households x 1 kg/day/household)
- Cost saved from waste reduction: 17t/d x 365days x USD23/t  
= **USD140,000/year**

**Cost recovery in 2.5 years!**

**Enlarged benefit:**

- Waste reduction: 40t/day (2007)
- Cost saved from waste reduction: 40t/d x 365days x USD23/t  
= **USD330,000/year**

**Cost recovery in 1 year!!**

## Why people practice composting at home?

**Household financial analysis:**

Organic waste: 1kg/day/household  
→ 30kg/month  
→ Compost: 6kg/month (20% of input)

Purchasing price: USD0.07/kg (= USD70/t)  
→ Income: USD0.42/month  
→ **Not enough economic incentive.**

**Main driving forces are:**  
improvement of kitchen environment &  
self-use of compost for plants and gardens

**Dropping out rate is High!**  
(only 20% continue practicing)

→ **Need a monitoring system (= Community environmental leaders)**



Purchased by  
Pusdikota  
(NGO)



## Estimated GHG emissions avoided at landfills

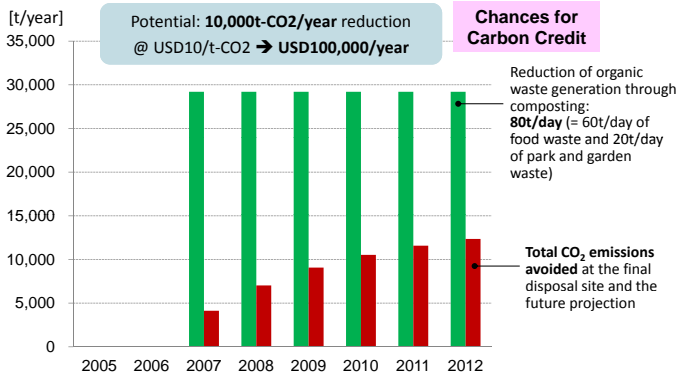


Figure 6 Reductions of organic waste generation and consequent greenhouse gas emissions in Surabaya (Prepared by Maeda (2009), based on the first order decay model from "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site (version 04)", CDM Executive Board, UNFCCC)

**Recommendations for other cities  
to achieve 10-20% waste reduction  
in 3 years**



### e.g. Actions for 10-20% reduction in waste generation

#### Inputs in Surabaya:

10-20% reduction target

Waste generation: 1,500 t/day → 1,300 t/day

→ Composting Centres: processing **40 t/day** (= 2-3% of total waste)

Population: 3 million (= 600,000 households)

→ Household compost baskets: **17,000 units** (= 2-3% of households)

#### Inputs in Sibul, Malaysia (proposal):

Waste generation: 130 t/day → 110 t/day (15% reduction)

→ Composting Centres: process **5 t/day** (= 4% of total waste)

Population: 200,000 (= 40,000 households)

→ Compost baskets: **1,000 households** (= 2.5% of households)

### e.g. Possible actions in Sibul, Malaysia

Target 20 t/day reduction

**130 t/day → 110 t/day**

(5 t/day by composting & 15 t/day by recycling)

#### 1. Market-waste composting centres

- Process **2 t/day** (= producing 0.4 t/day)

#### 2. Composting centres in communities and schools

- Process **0.5t/day** @ 4 sites → **2 t/day**

#### 3. Distribution of compost baskets to residents

- 1,000 households (2.5% of the total households) → **1 t/day**

#### 4. Organising a community clean-up campaign

- Involve private companies, local newspapers and TV programmes

#### 5. Compost purchasing scheme

- City starts purchasing the compost for park maintenance
- Free distribution to farmers; marketing of compost

#### 6. Technical assistance by Kitakyushu City, KITA, IGES and JICA

### Strategy for 10-20% Waste Reduction in 3 years

#### 1. Mayor's Commitment: Declare the target!

#### 2. Develop an Action Plan

- Institutional setup --- **Manager**, responsible department / staff
- Identification of **pilot projects** --- composting centres, communities
- Secure the **budget** [\*\*\*\$]
- Procurement of facilities, equipment and tools
- Training of staff
- Data management**: Amount of daily solid waste [\*\*\*t/day]
- Calculation of SWM cost: collection, transport, landfill [\*\*\*\$/t]

Install a weighbridge at landfills

#### 3. Operation of Composting Centres

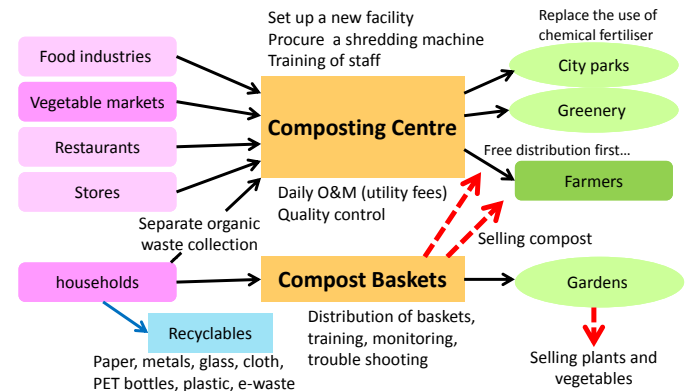
#### 4. Distribution of composting baskets to households

#### 5. Organise a community clean & green campaign

#### 6. Collaborate with the media, private companies, NGOs

### Strategy for 10-20% Waste Reduction in 3 years

#### Operation of a Composting Centre and Distribution of Household Compost Baskets



### Aerial View of Kemunyan Sanitary Landfill, Sibul



Source: Sibul Municipal Council



Data source: Sibul Municipal Council



## KEMUNYAN SANITARY LANDFILL, SIBU



First sanitary landfill in Sarawak



Cover soil, only for the 1st cell



Aeration chamber?



## KEMUNYAN SANITARY LANDFILL, SIBU



Leachate treatment



Regulation: BOD<50ppm



24hr pumping



## KEMUNYAN SANITARY LANDFILL, SIBU



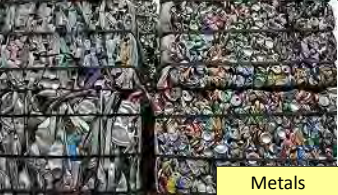
Collection of recyclables



Compacting



Plastics



Metals



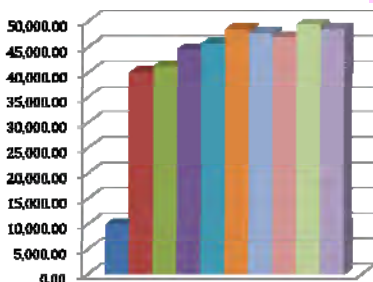
Composting In Schools

Source: Sibu Municipal Council

## Results in Sibu, Malaysia

Total amount of solid waste is not decreasing...

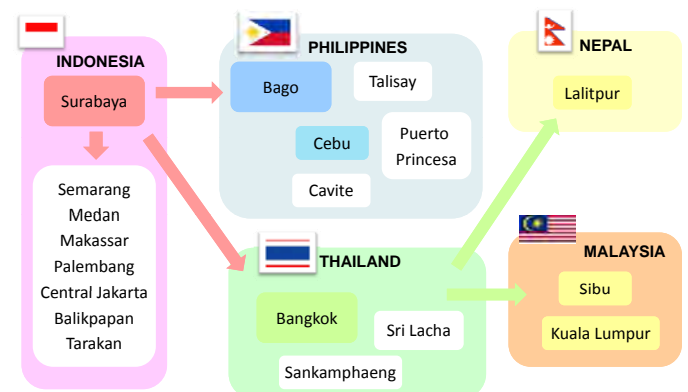
- Population is increasing
- Economy is growing
- More consumption, more waste
- The scale of composting practices may not be large enough...



It requires a **systematic and city-wide approach** to achieve total waste reduction.

**Commitment by the Mayor (leader) and responsible officers is a prerequisite.**

## Spreading Surabaya's model in other cities and countries





## Implementation in Bago, Philippines



Composting training  
Composting workshop



Distribution of compost boxes and pots for household use



Workshop in Bago  
in May 2009



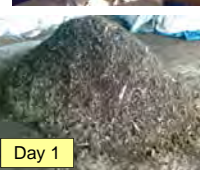
## Copied from Bago to Talisay, Philippines



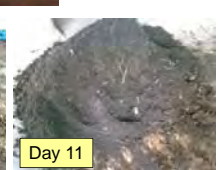
Composting Workshop in  
December, 2008 in Talisay



Hon. Mayor of Talisay



Day 1



Day 11

## Copied from Bago to Ternate, Cavite, Philippines



A composting centre build by an NGO  
in Ternate, Cavite



Participants in a work shop in Ternate,  
Cavite

## Copied from Bago to Cebu, Philippines

Dump site is full



2,000 baskets were  
distributed  
by Pagtambayayong  
(NGO)



A small vegetable garden next to a make-shift  
hose using compost made from kitchen waste



## Application in Bangkok, Thailand



A composting kit for  
household use



Distribution of household  
compost baskets



Composting  
training  
workshop in  
Bangkok



Workshop in Bangkok  
in March 2009

## Copied from Bangkok to Lalitpur, Nepal



Preparing seed compost  
Distributing compost baskets



Community workshop



Compost basket users



## Replication in 5 cities in Indonesia

In cooperation with JICA  
Indonesia Office and UN-ESCAP



Development of a National Organic Waste Management Strategy with National Development Planning Agency (Bappenas), Ministry of Environment (KLH), Ministry of Public Works (PU), Ministry of Agriculture, Ministry of SMEs

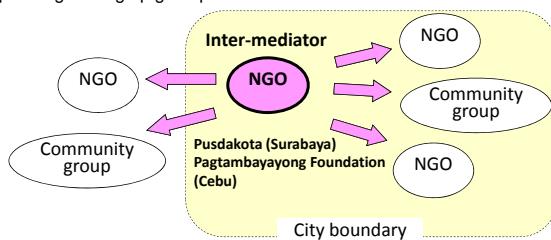
## Copied from Bangkok to Sibul and Kuala Lumpur, Malaysia



Workshop in Sibul and Kuala Lumpur in Dec. 2009 Development of a National Organic Waste Management Strategy with Min. of Housing and Local Govts (Malaysia) and MOEI

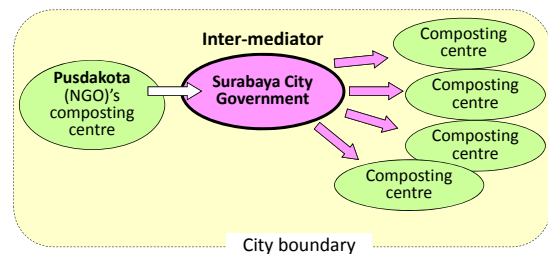
## Model 1: Replication by NGOs

Roles of **inter-mediators** are essential for replicating/scaling up good practices.



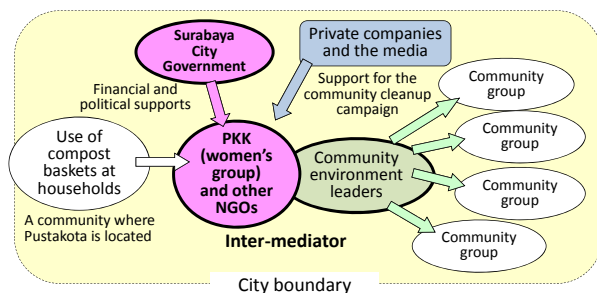
NGOs facilitate **replication** of good practices to other NGOs and community groups within and outside the city. But, they have difficulties in mobilizing resources from local governments.

## Model 2: Scaling Up by Local Governments



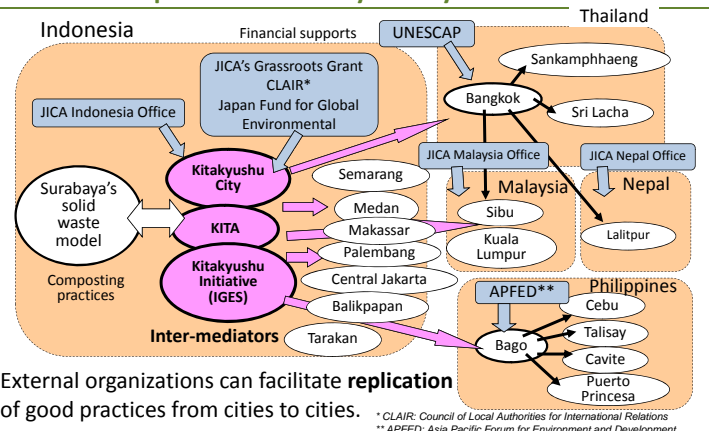
Local governments can **scale up** NGOs' good practices within the city. (It usually does not go beyond the city boundary.)

## Model 3: Scaling Up by Local Governments and NGOs



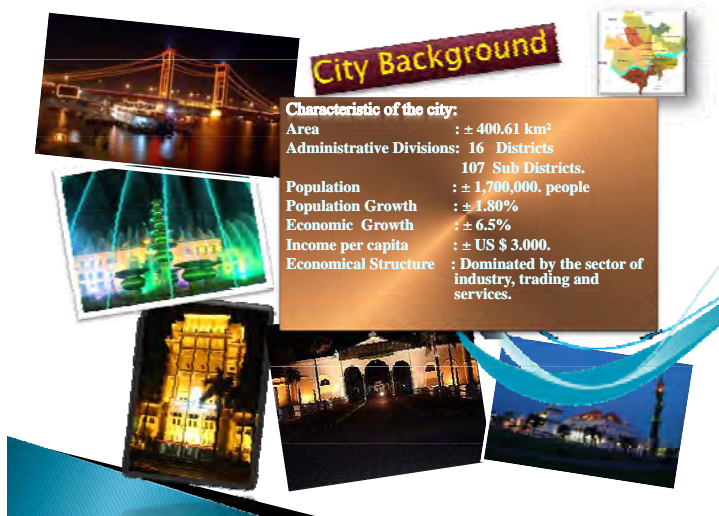
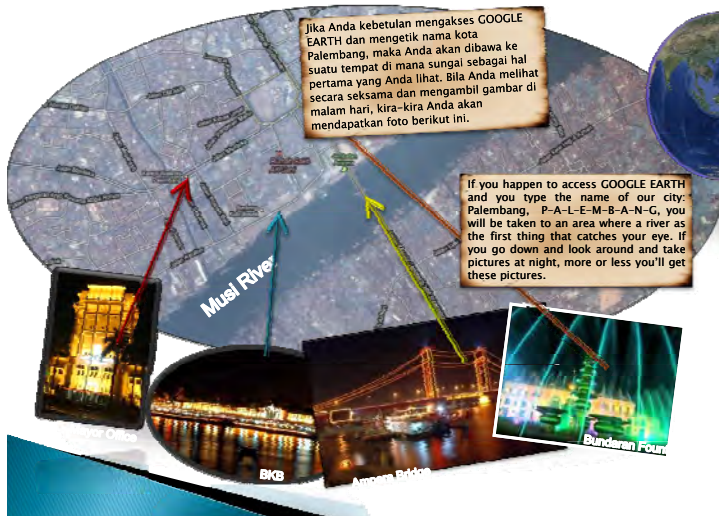
Local governments can assist NGOs/community groups in **scaling up** good practices to other NGOs/community groups within the city.

## Model 4: Replication from City-to-City



External organizations can facilitate **replication** of good practices from cities to cities.







MOTO  
Kota  
Palembang:

VISI

**Palembang Kota  
Internasional, Sejahtera dan  
berbudaya, 2013.**

MISI

1. Meningkatkan kualitas sumber daya manusia yang cerdas, sehat, bermoral, berbudaya serta beriman dan bertaqwa kepada Tuhan YME;
2. Meningkatkan kesejahteraan dan peran serta masyarakat dalam pembangunan;
3. Meningkatkan sarana dan prasarana perkotaan dan kualitas lingkungan sesuai rencana tata ruang yang berkelanjutan;
4. Mendorong pertumbuhan perekonomian daerah dengan peningkatan jejaring kerja antar daerah baik dalam negeri maupun luar negeri;
5. Melanjutkan reformasi birokrasi baik secara kultural maupun struktural untuk meningkatkan pelayanan kepada masyarakat;
6. Meningkatkan keamanan, ketertiban masyarakat secara adil dan merata serta mendorong terlaksananya penegakan hukum;
7. Melestarikan sumber daya alam, lingkungan hidup, warisan sejarah dan budaya.



### VISION

**Palembang as An International,  
prosperous and cultured City,  
2013.**

### MISSION

1. Improving the quality of human resources to be more intelligent, healthier, higher in moral standard, more civilized as well as faithful and devoted to God Almighty;
2. Improving the welfare and community participation in development;
3. Improving urban infrastructure and environmental quality according to spatial plan development;
4. Encouraging economic growth by increasing networking among regions both domestically and abroad;
5. Continuing reform of the bureaucracy both culturally and structurally to improve the public services;
6. Improving security, public order, in a fair and equitable and to encourage the implementation of law enforcement;
7. Conserving natural resources, environmental, historical and cultural heritage.



## REGULATION:

### 1. UNDANG-UNDANG NO.18 TAHUN 2008 TENTANG PERSAMPAHAN

### 2. PERATURAN DAERAH NO.12 TAHUN 2006 TENTANG PENGELOLAAN DAN RETRIBUSI PERSAMPAHAN DAN KEBERSIHAN

### 3. MASTER PLAN PERSAMPAHAN DAN DED TPA 1 DAN TPA 2



## Characteristic of waste in Palembang City

Waste Generation :  $\pm 750$ ton/day

Waste Composition:

- Biodegradable: 62.3 %
- Plastic : 17.5 %
- Paper : 15.1 %
- Metal : 0.5%
- Glass : 0.9 %
- Cloth : 2.7 %
- Other : 1.1 %



## Facility of Solid Waste in Palembang City

Alat Angkut	Amount	Capacity per unit (m <sup>3</sup> )
Gerobak sampah	440	1-1.5 M3
Big Dump truck	80	6 M3
Small Dump truck	26	6 M3
Trailer container	178	6 M3
Waste Motorcycle	17	1 M3



Final Disposal Site	Area
TPA I	25 Ha
TPA II	40 Ha



Pasukan kuning sedang  
membersihkan salah satu jalan  
Protokol

## LANDFILL IN PALEMBANG CITY



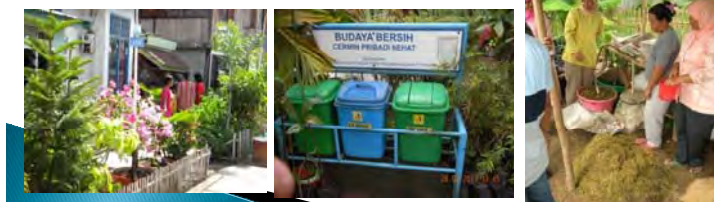




## 1. Eco Friendly Village

Is : Eco friendly Village base on Community Development

Goal: To reduce waste generation in Final disposal site



### CRITERIA OF ECO FRIENDLY VILLAGE :

- COMMUNITY ORGANIZATION THAT RESPONSIBILITY TO ENVIRONMENTAL MANAGEMENT
- SORTED WASTE
- COMPOSTING
- CLEAN WATER
- SANITATION
- GREENING
- TEMPORARY DISPOSAL SITE AND GARBAGE PLACE
- CLEAN WASTE
- DECORATIVE PLAT ARRANGEMENT
- HERB
- RENEWABLE ENERGY
- BIOPORI INFILTRATION HOLE / WELLS



### TRAINING FOR ENVIRONMENT CADRES



## A NEW PROGRAMME TO SUPPORT ENVIRONMENTAL FRIENDLY VILLAGE (KRL) IN PALEMBANG CITY

*" WASTE BANK "*

## WASTE BANK IN PALEMBANG CITY

### OBJECTIVES :

- To increase public awareness to separate, manage, reuse and recycle waste (3R; Reduce, Reuse and Recycle)
- To create clean and green environment
- To create job vacancies and increase community's investment



## LOCATIONS OF WASTE BANK IN PALEMBANG

### ON GOING WASTE BANK

- Griya Bahagia settlement at Sukarame district (Bahagia Mandiri Waste Bank)

### ON CONSTRUCTING WASTE BANK

- Hikmah road (Setunggal) at Ilir Timur II district, 8 Ilir sub district (Hikmah Sejahtera Waste Bank)
- At Sukodadi sub district, Sukarame district
- At 28 Ilir sub district, Ilir Barat I district (Kencana Waste Bank)
- At Fagih Usman road (1 Ulu) Seberang Ulu I district (Kenanga Waste Bank)



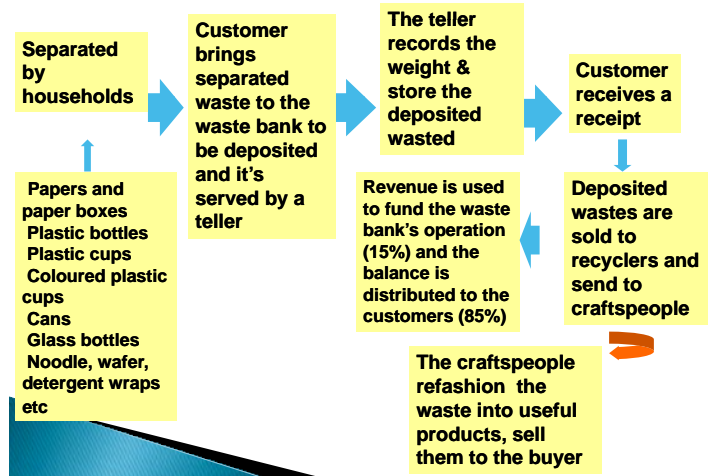
## BAHAGIA MANDIRI WASTE BANK

- Found in November 2011 (under supervision of environmental protection agency, BLH of Palembang city)
- First budget ; 6.7 millions (IDR) of community's budget at Griya Bahagia settlement
- 60 customers

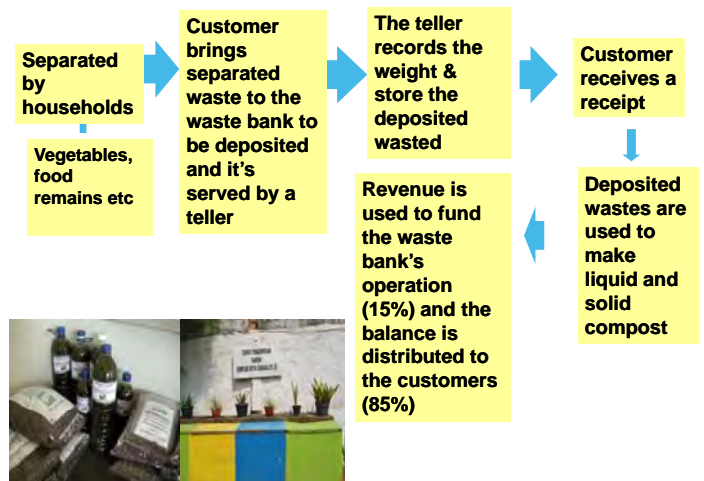


## HOW DOES BAHAGIA MANDIRI WASTE BANK WORK?

### NON ORGANIC WASTE



### ORGANIC WASTE





## 2. Eco Friendly School

### Goal :

- Environmental Education of school ages
- Waste Management 3R System
- Involving the participation of student in Environmental Management
- To reduce waste generation from school



## 3. Eco Friendly Office

### Goal :

- Waste management 3R system at the office
- To reduce waste generation to final disposal from office.



Pemilahan Sampah dan Pengomposan di kantor Pemerintah

## 4. Eco Friendly Market

### Goal :

- Waste management 3R system at the market
- To reduce waste generation to final disposal from market



### More about Waste/Garbage

#### PROGRAM Pengembangan Kinerja Pengelolaan Persampahan

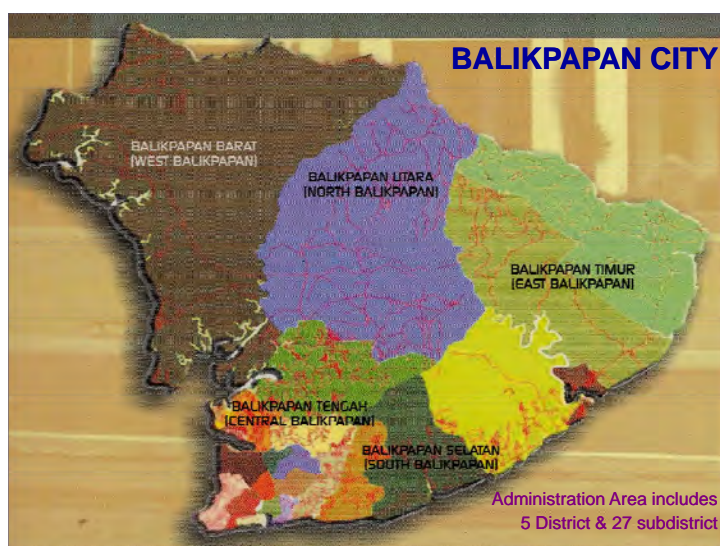
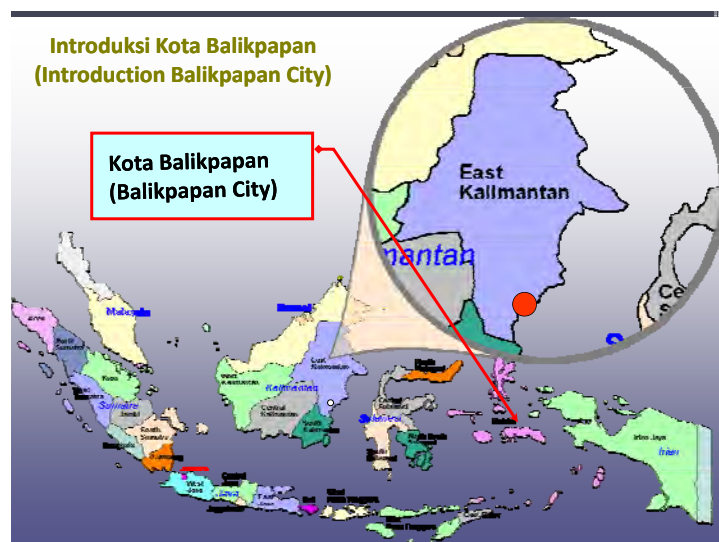
1. Merumuskan kebijakan pengelolaan persampahan.
2. Menyediakan sarana dan prasarana pengelolaan persampahan.
3. Meningkatkan operasional dan pemeliharaan infrastruktur.
4. Mengembangkan teknologi pengelolaan persampahan.
5. Meningkatkan kemampuan aparat pengelola persampahan.
6. Mensosialisasikan kebijakan pengelolaan persampahan.
7. Meningkatkan peran serta masyarakat dalam pengelolaan Persampahan

#### Programs for development of Waste Management Performance.

1. Formulating a solid waste management policy.
2. Providing facilities and waste management infrastructure.
3. Improving and maintaining operational facilities and infrastructure.
4. Developing waste management technology.
5. Improving the ability of the officials.
6. Socializing waste management policy
7. Increasing community participation







### Profil Kota Balikpapan (Profile Of Balikpapan City)

**LUAS WILAYAH KOTA BALIKPAPAN 83.189 Ha / 831 Km**  
 (Area Of Balikpapan City : 83.189 Ha / 831 Km)  
**MELIPUTI DARAT 503 Km DAN LAUT 328 Km**  
 (Land : 503 Km Sea : 328 Km)

**Topografi : 85% berbukit-bukit, 15% dataran**  
 (Topography : 85% hilly, 15 % Flat Area)  
 Temperature : 22,7°C - 34,6°C  
 Curah Hujan/Annual precipitation : 9,0 mm - 133,4 mm

**Jenis Tanah: Podsolik merah dan Podsolik merah kuning & Pasir Kwarsa (rawan longsor)**  
 (Soil Type: Red Podsol and Yellow red podsol & Silica sand (Vulnerable to land slide))

**Jumlah Penduduk (2011): 631.530 jiwa (Population (2011) 631.530 People)**  
**Tingkat Pertumbuhan: 4,52% per tahun (Growth rate : 4,52 % per year)**  
 (pertumbuhan alami 1,56% dan migrasi 2,96%) (Natural growth 1,56% and immigration 2,96 %)



- ### Landasan Hukum Pengelolaan Persampahan (Waste Management Legal Foundation)
- Landasan Hukum (Legal Basis) :**
- ♦. **Perda No. 17 Tahun 2008, Tentang Pembentukan Organisasi DKPP (Local regulation of balikpapan City 17/2008 on organization establishment)**
  - ♦. **Perda No: 10 th.2004, Tentang Pengelolaan Sampah (Local regulation of balikpapan City No. 10/2004 on waste management)**
  - ♦. **Perda No: 09 Th.2011, Tentang Retribusi Pelayanan Persampahan / Kebersihan. (Local regulation of balikpapan City No: 09/2011, on Retribution for Solid Waste / Hygiene Service)**



## KEBIJAKAN TENTANG PENGELOLAAN PERSAMPAHAN (SWM Policy)

7

- KEBIJAKAN MENERAPKAN PENDIDIKAN LINGKUNGAN HIDUP (PKLH) DALAM KURIKULUM SEKOLAH**  
(The ENVIRONMENTAL EDUCATION APPLICATION POLICY (PKLH) IN THE SCHOOL CURRICULUM)
- PELAKSANAAN PROGRAM CLEAN, GREEN AND HEALTHY CITY**  
(IMPLEMENTATION OF CLEAN, GREEN AND HEALTHY CITY PROGRAM)
- PEMBANGUNAN BANK SAMPAH**  
(Development of Bank Waste)



## MASTERPLAN PENGELOLAAN PERSAMPAHAN DAN KEBERSIHAN KOTA BALIKPAPAN

(The Waste Management and Cleanlines Masterplan of Balikpapan city)



Dibuat oleh Badan Perencana Daerah  
Kota Balikpapan dengan konsultan  
pelaksana PT. Pandu Pelaksana

(Created by the Regional Planning Board with the  
consultant managing of Balikpapan the city PT. scout  
Executive)

## PELAYANAN SAMPAH KOTA BALIKPAPAN

9

(Waste Service at Balikpapan City)

- TIMBULAN SAMPAH KOTA BALIKPAPAN 505 Ton/hari**  
(Balikpapan City Waste Generation 505 tons / day)
- SAMPAH YANG TERANGKUT KE TPA 325  
Ton/Hari mei 2012** (Waste transported to landfill 325 Ton / Day of  
May 2012)
  - TAHUN 2010 : 310 TON/HARI (at 2010 : 310 Ton/day)
  - TAHUN 2011 : 297 TON/HARI (PENURUNAN 4%)  
(at 2011 : 297 Ton / day) (Decrease 4%)
  - MULAI PELAKSANAAN PROGRAM 3 R (START OF PROGRAM 3 R)
  - TAHUN 2012 : 325 TON/HARI (KENAIKAN 12%)  
(at 2012 : 325 Ton/day) (Increase 12%)
  - KONDISI CUACA (CURAH HUJAN TINGGI)  
(Weather Condition (high rainfall))
- TINGKAT PELAYANAN 2011 = 84 % Dari Luas  
Kota**  
(service covering area 2011 = 84% of area)



## Peran Swasta Dalam Pengelolaan Sampah)

(Role of private sector in waste management)

### SAMPAH MEDIS (Medical Waste)

Dikelola oleh Dinas Kesehatan Kota Balikpapan bekerjasama  
dengan pihak swasta CV. Indah Karya  
Sampah B3 & Industri

### SAMPAH B3 DAN INDUSTRI (Hazardous & Industrial Waste)

Untuk limbah padat tidak berbahaya langsung di buang ke TPA oleh  
masing-masing industri atau bekerjasama dengan DKPP  
sedangkan B3 dapat dilaksanakan pihak swasta PT. BES  
(Balikpapan Enviromental service)



10

## Pembiayaan Anggaran Pengelolaan Sampah)

(Financial management on SWM)

Tahun (Year)	APBD Kota (City Budget)	APBD Propinsi (Provincial Budget)	Jumlah (Total)
2009	Rp. 26.037.262.806,00	Rp. -	Rp. 26.037.262.806,00
2010	Rp. 28.877.470.357,18	Rp. -	Rp. 28.877.470.357,18
2011	Rp. 38.198.183.396,00	Rp. 300.000.000,00	Rp. 38.498.183.396,00
2012	Rp. 38.215.278.194,40	Rp. 10.300.000.000,00	Rp. 48.515.278.194,40



## JUMLAH PERSONIL

(Human resources)



- PENGAWAS (Supervisor) : 18 org/People
- SUPIR (Driver) : 71 org/People
- PETUGAS PENGANGKUT SAMPAH (Official garbage) : 329 org /People
- PETUGAS DRAINASE / ATAS AIR (DRAINAGE OFFICIAL) : 41 org/People
- PENYAPU JALAN (street sweeper) : 210 org/People



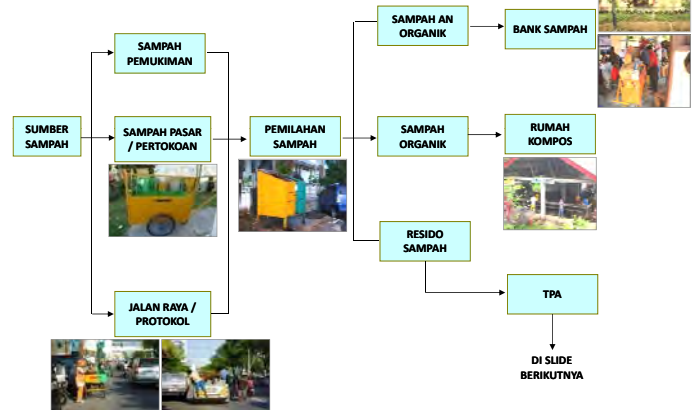
## KOMPOSISI SAMPAH KOTA BALIKPAPAN TAHUN 2011

Balikpapan city waste composition year 2011

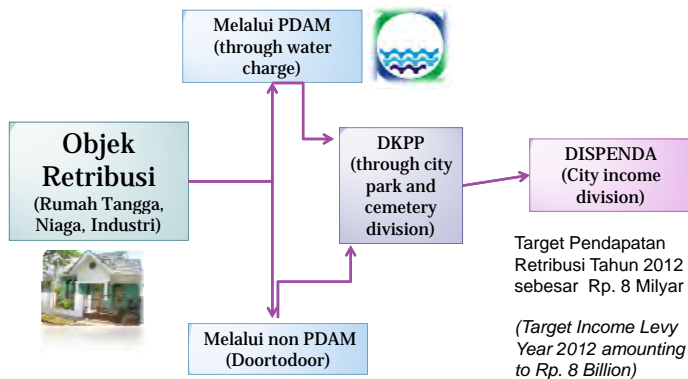
NO	KOMPONEN	SUMBER SAMPAH (% ROBAT)			
		PEMUKIMAN	PASARAN	DAERAH KUMUH	DATA BATA
1	Organik	59,10%	92,30%	50,11%	61,21%
2	Kertas	2,05%	1,16%	1,72%	1,54%
3	Karton	4,57%	1,16%	6,52%	4,08%
4	Plastik	13,19%	3,35%	22,28%	13,90%
5	Gelas	1,22%	0,21%	2,10%	1,45%
6	Logam	0,46%	0,00%	0,34%	0,37%
7	Tekstil	1,55%	0,19%	2,16%	1,30%
8	Karet, Kulit, Bahan Imitasi	0,25%	0,00%	0,72%	0,32%
9	KC	0,31%	0,04%	0,11%	0,11%
10	Batu	4,13%	0,58%	0,60%	1,80%
11	Sesaki	9,67%	0,96%	12,77%	7,62%

Sumber : Analisa Konsultan, September 2011

## Municipal waste flowchart



## METODE PEMUNGUTAN RETRIBUSI SAMPAH Waste retribution collection method



## KAPASITAS ARMADA SAMPAH CAPACITY OF WASTE ARMADA

NO	JENIS KENDARAAN	JUMLAH UNIT	RITASI	KAPASITAS (m³)	KAPASITAS TOTAL (m³)	Persentase (%)
1	Arm Roll	6	2	8	115,2	12,37
2	Dump Truck	29	2	8	556,8	59,79
3	Pick Up	11	1	2	26,4	2,84
4	Compactor	2	2	4	115,2	12,37
5	Truck/Engkel	11	2	4	105,6	11,34
6	Truck/Moben	5	2	1	12	1,29
JUMLAH		64	11	27	931,2	100,00
Kapasitas Alat angkut eksisting					251,42	ton/hari
Beban Pengangkutan Tahun 2011					380	ton/hari
Kecukupan alat angkut					66%	

Sumber : Data DKP dan perhitungan konsultan, 2011

Armada dimiliki oleh Pemerintah Kota sendiri  
(Armada owned by local Government).



## KAPASITAS SARANA OPERASI PENGUMPULAN (COLLECTION CAPACITY OF FACILITIES)

NO	JENIS TPS	JUMLAH WADAH TAHUN 2011	PROPORSI	KAPASITAS WADAH (m³)	KAPASITAS TOTAL (m³)
1	Kontainer 8 m³	18	4%	13	230
2	Kontainer 1 m³	45	9%	1	54
3	TPS Beton	439	87%	3	1.120
Jumlah		502	100%		
Kapasitas Alat Pengumpul Eksisting (m³/hari)					1.404
Kapasitas Alat Pengumpul Eksisting (ton/hari)					379
Beban Pengumpulan Tahun 2011 (ton/hari)					380
Kecukupan Sarana (%)					100%

Sumber : Data DKPP, dan perhitungan Konsultan, 2011

## Kegiatan Antara Sebelum masuk TPA (Activity Between Before entering the landfill)



Rumah Pemilahan Sampah  
Penanggung Jawab DKPP (dinas kebersihan pertamanan dan pemakaman)

Waste sorting house, under the responsibility of cleansing, park and cemetery departemen



Komposting dan Pemilahan Sampah di Sekolah

School waste separation and composting

Bank Sampah  
Waste Bank



## Potensi Daur Ulang Sampah (Waste Recycling Potential)

KOMPOSISI	BERAT SAMPAH (Ton/hari)					
	2011	2012	2017	2022	2027	2032
Kertas	7	7	8	9	10	11
Kartoon	16	16	18	19	21	23
Plastik	52	54	59	59	71	77
Gelas	5	5	6	7	7	8
Logam	1	1	1	1	2	2
Total Potensi Daur Ulang	82	84	93	96	111	120
Total Timbunan Sampah	380	388	431	473	516	558

Sumber : Analisis Konsultan, 2012



Penataan lahannya dengan system Cut and Fill.

Lapis kedap air (Geomembran) dengan luas 26.000 m<sup>2</sup> pada Zona I dan 30.000 m<sup>2</sup> pada Zona II, kemudian diberi lapisan penutup (tanah merah) setebal 40 cm. Instalasi Pipa leachate dan Gas dengan jarak 20 m (10) Baris. Sistem Pemusnahan sampah adalah Sanitary Landfill.

## Sosial dan Pendidikan (Society and education)

### A. Organisasi Sosial

1. Institute Of Global Enviromental Strategis (IGES) JICA  
Telah dikembangkan Program Pengelolaan Sampah Berbasis Masyarakat (PESAMAS)
2. Yayasan Peduli  
telah membantu pemerintah mensosialisasikan kepada masyarakat bagaimana mengolah sampah dan telah memproduksi kompos
3. Yayasan Walibar (Unilever)  
Telah berpartisipasi mendukung, mensosialisasikan terbentuknya Bank Sampah dan memotivasi masyarakat bersama program CGH.
4. LSM Stabil (Sentra Program Kemitraan dan Lingkungan)  
Membantu Pemerintah dalam memberikan masukan terhadap Program sanitasi Kota.



## Pendidikan Lingkungan Hidup (Environmental Education)

### Pendidikan Formal (Through formal education)



Berdasarkan konsep Pendidikan untuk Pembangunan Berkelanjutan (Based on the concept of Education for Sustainable Development)



program Nasional dengan menekankan isu-isu lingkungan di tingkat global untuk lokal ("Sekolah Tinggi Mangrove" dan "sekolah Rainforest Tinggi") (Nationwide program with emphasizing environmental issues at the global to local level ("Mangrove High school" and "Rainforest High school"))



sebanyak 11 sekolah di Balikpapan secara resmi ditunjuk sebagai "Sekolah Adiwiyata" (To the recent date, 11 Schools in Balikpapan are officially appointed as "Adiwiyata School")

## Pendidikan Sosial Pengelolaan Sampah (Social Education Waste Management)

### Sosialisasi Komposting Composting training



### Pelatihan Daur Ulang Sampah – Waste recycling training



Sosialisasi CGH / Clean, Green and Healthy city training







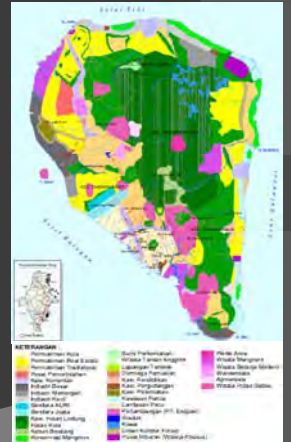
## CLEANING, LANDSCAPING AND CEMETERY AGENCY

LOCAL GOVERNMENT OF TARAKAN CITY

### TARAKAN ISLAND



1. Area (km<sup>2</sup>) = 657,33
2. Total Population (people) = 239.787



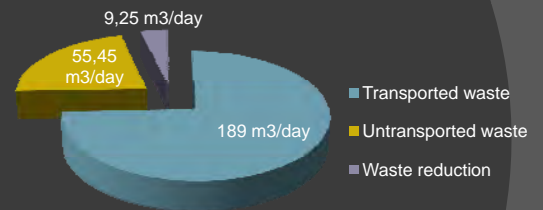
### National Law

ACT No. 18 Year 2008 of Waste Management

Regulation of the Minister of Public Works  
No. 14/PRT/M/2010 of Minimum Service Standards  
for Public Works and the field of Spatial Planning

Solid waste  
management

### Waste Generation of Tarakan City



1, 039 Liter/day  
Total 253,7 m³/day  
Transported waste 189 m³/day  
Untransported waste 55,45 m³/day

Sources of municipal waste  
tarakan

Household	54%
Commercial Shop	1%
Institution	1%
Commercial Restaurant	1%
Market	4%
Street sweepings	29%
School	5%
Hotel	6%

Source : DKPP, 2011

Fig. 2 Waste Source in Tarakan City

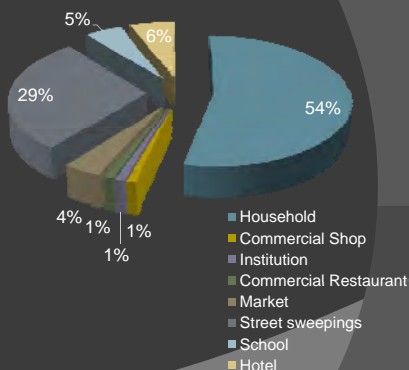
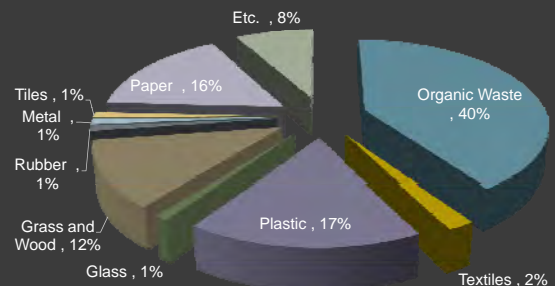


Fig. 3 Household waste composition



Source : DKPP 2011





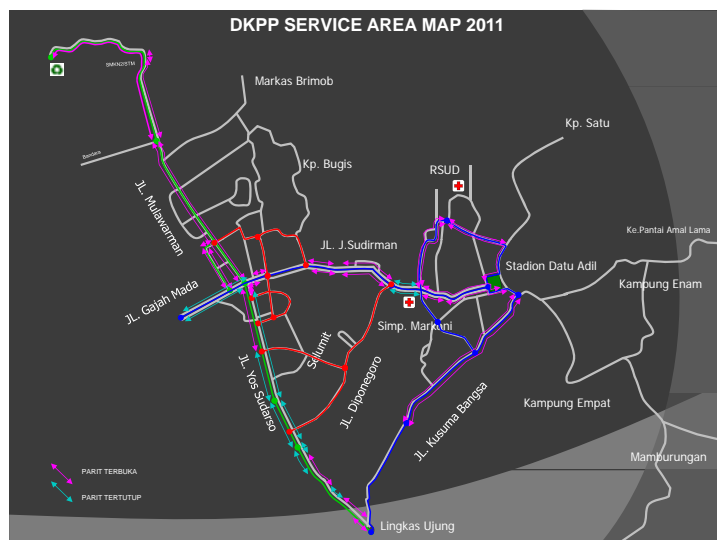
## CLEANING, LANDSCAPING AND CEMETERY AGENCY OF TARAKAN CITY

### VISION :

"AS THE BEST CLEANING AGENCY IN KALIMANTAN BY 2014  
AND THE BEST CLEANING AGENCY IN INDONESIA BY 2020"

### MISSION :

1. The increased quantity and quality Hygiene Services, Garden and Cemetery;
2. Increase Community Participation;
3. Building Coordination of partnership between government, business and society;
4. Doing Guidance;
5. Doing Supervision.



## TARGET

- ☐ Keeping hygiene in the area operational
- ☐ Reducing waste generation
- ☐ Further processing into zero waste
- ☐ Participation from all the elements of society
- ☐ Changing the mindset of waste
- ☐ Changing the habit into the way of life

### Long Term Policies

1. Promote waste separation at household level
2. Establish 20 composting programmes (5 composting programmes established)
3. Reduce the volume of waste (Target 20%)
4. Socialize waste reduction programmes to schools, offices, companies, and community
5. Building partnership with media and academic groups
6. Develop compost standards

### Short Terms Actions within next 6 months (2012)

Short terms	Current Status
Workshop waste management in school and household	Disseminating 3R program's
Waste Separation in Source in 2 village	
Implementing composting program using takakura	4 MRF and several communities are involved in implementing community-based composting programmes using Takakura, Open windrow and barrel composter
Establish waste bank and MRF	Established MRF in Kampung satu
"Tabungan Lingkungan" (TALING) in 20 Schools of Adiwiyata	Disseminate and implement Taling programs and adiwiyata 7 schools of pilot project



## Waste Reduction

The effectiveness of TPS3R (MRF) in neighborhood is 96 %  
Waste reduction from junkshop is 2,64 % of city waste generation  
Average waste reduction from TALING 1kg/week/student

Note :  
Count for TALING still in progress

## TPS3R (Community Composting) / MRF

No	Name of TPS3R	Location	Source of waste	Waste a day
1.	KSM Lestari	Kr. Rejo	Neighborhood, market	0,1 tons / day
2.	KSM Asri	Kr. Anyar Pantai	Neighborhood	*
3.	KSM Ramah Lingkungan	Kamp. 6	Neighborhood	*
4.	KSM Nibung	Kamp. 1	Neighborhood	*
5.	TIS KEBAL	Boom panjang	Market	*

Every TPS3R has 4 custodians.  
They using Takakura method and using shredding machine  
They selling the compost to community, school and the companies

\*count still in progress

## Waste reduction in Tarakan 3 years later

Government commitment is to establish 1 TPS3R in 1 village,  
By 3 years later, Tarakan will have 10 TPS3R  
It will reduce about 1 ton organic waste / day

Taling will establish in 104 schools  
Waste reduction by students is about 1,2 tons anorganic waste / day

## Seminar KitaQ composting system (2011)



### 1. Waste Management with 3R system



### 2. Classified Trash Bin

to make separating rubbish easier. There are 250 units of it scattered throughout the city





### 3. Community waste sorting program

DKPP provide S3R counseling and classified plastic bag to community



### 4. Environment Saving (TALING)

Inspired by the eco-savers from Marikina in the Philippines  
Launched at February, 21 th 2012



The Execution of MoU



Launched marked by granting passbook to students

TALING Team consisting of Planning Agency, Cleaning Agency, Environmental Agency, Education Agency, and Assistance of development  
There are 7 pilot project schools that running this program  
Addition of 20 schools by August 2012



## Challenges

- Community participation
- Field Team
- Improvement and development of existing systems
- Healthy environment is affordable

## Lessons for other cities.

There are some activities that are emulated by other cities such as "Green n Clean" contest

Some city invited custodian of TPS3R to provide training

**END OF  
PRESENTATION**

ありがとうございます

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E-Mail : arinda.enviro05@gmail.com



**A Follow –up Seminar of KitaQ  
System Composting in Asia  
17<sup>th</sup> – 20<sup>th</sup> July 2012  
Solid Waste Management at Sibu City**

Presented by :Inya Anak Anchai  
Assistant Environmental Health Officer U29,  
Sibu Municipal Council, Malaysia.



**Sibu – Gateway and Regional Centre of Central  
Sarawak, Malaysian Borneo**



**SMC Background**

Founded on 1 November 1981  
after it was upgraded to the  
status of a Municipal Council of a  
District Council.

A Local Authority which have  
approximately 600 employees

Administration Area - 129.5  
square kilometers

Total Population -240,402



**Vision**

Towards a  
Progressive &  
Community-  
focused Local  
Authority



**Mission**

To deliver quality  
services through  
community engagement  
To achieve development  
and sustainable urban  
environment



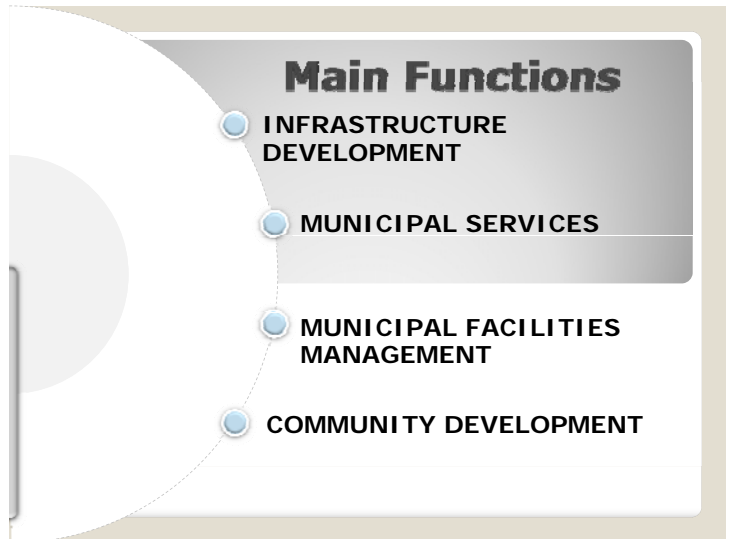
**Main Functions**

INFRASTRUCTURE  
DEVELOPMENT

MUNICIPAL SERVICES

MUNICIPAL FACILITIES  
MANAGEMENT

COMMUNITY DEVELOPMENT





[illegible]

**SOLID WASTE  
MANAGEMENT IN SIBU  
CITY, MALAYSIA.**

## Outline of Presentation

- 1 Waste Management Practices
- 2 (Short-term action)Engaging the Communities
  - Recycling
  - Composting/Takakura Composting
  - Enzyme Making
  - Say No To Plastic Bags
  - Say No to Plastic Mineral Water Bottles

## Waste Management Practices

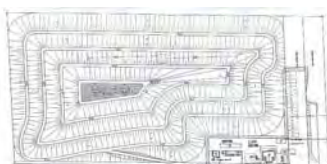
- Area: 129.5sq km with Population: 240,402
- Waste Generation: 130 tone per day
- Waste generation per capita: 0.65kg
- SWM Cost: 5.2 million per year
- Sanitary Landfill of 13 acres costing RM10.5 million operating since 2001
- Extension of 2 more cells in 2012
- New sewage treatment plant completed in 2010 and began operations in 2011.

## Modus Operandi of Collection

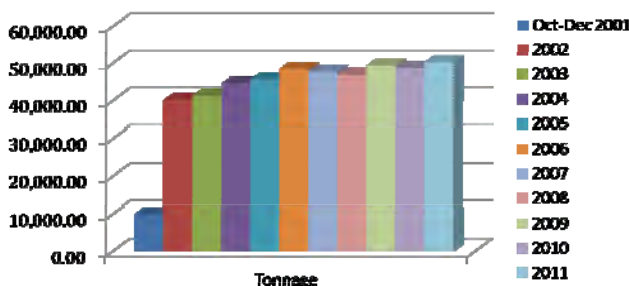
- Privatized collection
- Coverage: 100% of the municipality
- 4 collection zones
- Frequency:
  - Residential: 3 times weekly
  - Commercial: once daily
  - CBD and markets: twice daily
  - Annual spring cleaning before Chinese New Year

# Overview of Kemuyang Sanitary Landfill





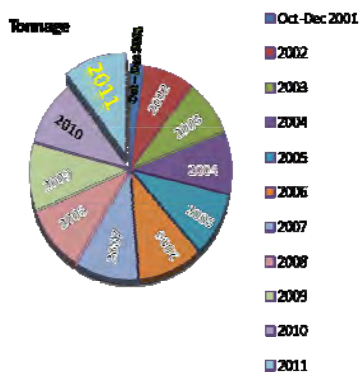
Monthly waste disposed at Kemuyang Sanitary Landfill, Sibul from 2001 up to date



Years	Oct-Dec 2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Tonnage	9,759.49	39,876.52	41,055.83	44,372.14	45,503.81	48,225.73	47,532.01	46,714.64	49,165.51	48,344.93	50,032.22

Total tonnage up to date = 470,582.83

Monthly waste disposed at Kemuyang Sanitary Landfill, Sibul from 2001 up to date



Year	Tonnage
Oct-Dec 2001	9,757.49
2002	39,876.52
2003	41,055.83
2004	44,372.14
2005	45,503.81
2006	48,225.73
2007	47,532.01
2008	46,714.64
2009	49,165.51
2010	48,344.93
2011	50,032.22

Total tonnage up to date = 470,582.83

Increase in solid waste disposal is expected as a result of **septic sludge activities** carried out from 2011 until now.

## Waste Composition by Weight ( 2011)

Item	Material	Percent (%)
1	Organic matters	49.5
2	Plastic	14.50
3	Paper	10.51
4	Paper Carton	8.80
5	Textile Waste	5.20
6	Glass	3.80
7	Ferrous Material	3.40
8	Rubber	2.80
9	PVC	1.20
10	Polystyrene	0.10
11	Aluminum	0.10

## Waste Reduction Initiatives by SMC

- Fostering cohesive relationships and engage the local communities through
  - Local Agenda 21 (Recycling, composting, enzyme, cleaning campaigns)
  - Segregation of C & D waste into another site
  - 'Say No to Plastic Campaign' (Every Monday)
  - Say No to Plastic Mineral Water Bottles
  - Waste separation at source



## Waste Management Activities To Reduce Waste

### 1. Composting Centre



### 2. Promoting:

#### a. Community composting



### 2. Promoting:

#### b. Waste segregation at Source (pilot)

Month	Total Collection at Pulau Li Hua (in Kilos)	Total Collection at Taman Seduan (in Kilos)	Total collection at Police HQ	Total Collection at Bukit Lima Area	Total
June 2011	587	77	-	-	664
July 2011	1,301	353	-	-	1,654
August 2011	735	360	-	-	1,095
September 2011	880	2,084	-	-	2,964
October 2011	380	136	224	-	740
November 2011	700	405	39	432	1,576
December 2011	604	1,783	5	992	3,384
January 2012	1,161	188	45	1,482	2,876
February 2012	589	496	139	442	1,666



### 2. Promoting: (recycling, composting & garbage enzyme) c. Community Awareness



### 3. Recycling Centres (9)



### 4. Collection of recyclables at sanitary landfill

- Council is having a memorandum of understanding with a contractor to retrieve and collect recyclable materials from Kemunyang Sanitary Landfill effective January 2012





## Collection of used cooking oil

Collaboration with Sekitar Bumi Hijau Sdn. Bhd.

Grand total for 2012 : 17611.63 litres

## Long - term goals

Laws and enactments of waste segregation

## Community Recycling

- Started in 1990's
- Working closely with Sibu Kidney Foundation – all proceeds from sales of recyclable items goes to charity
- Activities
  - Talks to schools and NGOs
  - Giving free recycling bins and receptacles
  - Free collection from bins placed with NGOs premises
  - Management of Communal recycling centres

## Community Composting

- Started in 2008
- Pilot projects in 3 residential neighborhoods and 3 secondary schools
- Activities
  - Briefing, demonstration, free compost bins, follow up inspection, competition
  - Communal composting centre (Market hawkers and schools)
  - JICA is helping to organize a regional workshop on Takakura Method of composting in Dec 2009

## Community Garbage Enzyme Making

- household garbage enzymes has suddenly became very popular among the community
- SMC and the NGOs have been going round schools, religious bodies and the communities to give talks and giving demos
- Objective: reducing garbage while producing environmental friendly enzymes for household use and cleansing drains, septic tanks, lakes,



## 'Say No to Plastic Bags'

- Getting all major supermarkets, fastfood chain, bookshops to participate.
- No plastic bags are to be given on every Mon
- RM0.20 shall be charged should the customers insisted having plastic bags
- Participating outlets given an 'Environmental Partner' status
- Encourage NGOs to give away eco-friendly bags



## Say No to Plastic Mineral Water Bottle

- Launched in Jan 2010
- Started with Sibu Municipal Council
- To be extended to Government Departments
- Installed water dispenser
- Stop distributing plastic mineral water bottles during meetings
- Use glasses or paper cups



## Waste Separation at source (Pilot)

- Started in June 2011
- Once a month ( every 15<sup>th</sup> of the month), the resident have to segregate the recyclable item outside the entrance of their house.
- Pilot projects in 3 residential neighborhoods and 1 government quarters .
- Activities
  - Briefing, demonstration, collection services



## Achievements of proposed program

### Waste separation at source

- This program has helped reduce the waste in a sanitary landfill of **12,077 kg**.
- A total of **RM3500.97** sale of recyclable items collected in 2011 for the 4 neighborhoods involved and donated to charity.

## Impacts of the project

### Environmental Impacts

- Increase the level of cleanliness
- Beautify the city
- Reduce the pollution
- Extend landfill life-span

## Impacts of the project

### Social Impacts

As financial resources ( proceed of the sale of recyclable items)

Increase awareness and involvement of local communities.

Help reduce the risk of disease due to unhygienic environment.

Charitable purposes.



### Challenges in solid waste management of Sibu City, Malaysia

1. Public attitude  
(Indiscriminate dumping)
2. Malpractice of disposal
3. Littering at public places
4. Discharge into drain
5. Disposal of used tyres
6. Laws in segregation

### Recommendations

- to enact waste segregation law
- To increase locality for the waste separation for recycling
- to strengthen management of existing programs







## Basic Info Population

Malay : 30.2%  
Chinese : 56.2%  
India : 11.9%  
Others : 1.7%



## Background

- 32,000 household ( 120,000 population)
- MSW generation : **120 tons / day**
- **100 tons/day** (household)
- **20 tons/day** (business entities)
- **0.68kg/cap/day.**



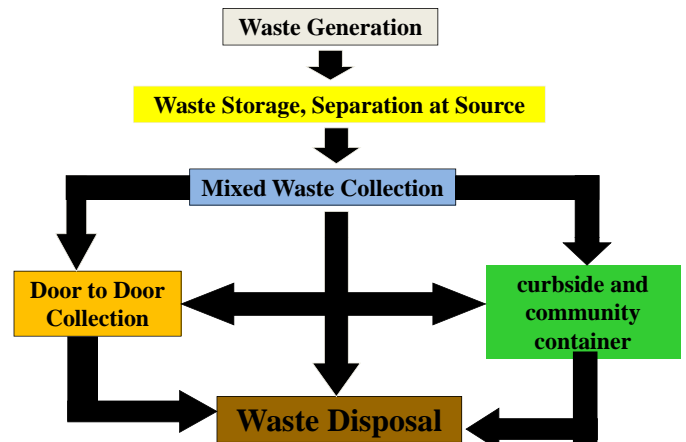
## Waste composition

Metal : 2.4 %  
Glass : 3.5 %  
Plastic 8.1%  
Others : 14.8 %  
Paper 31.2 %  
Food waste : 40%

Most of the waste  
can be  
**RECYCLE!!**

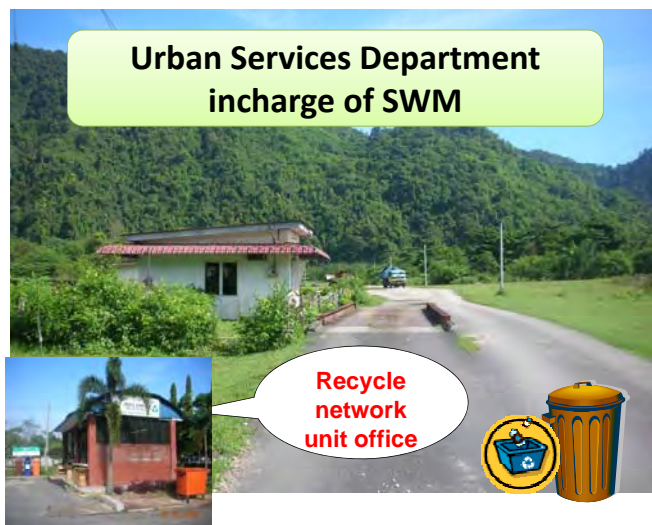


## SWM in Kampar





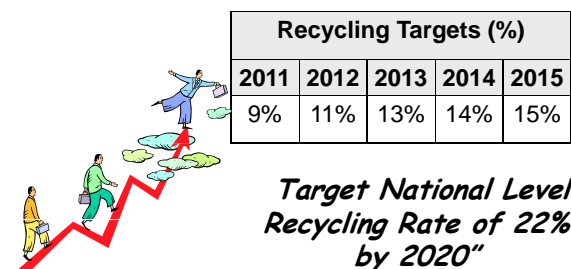
## Urban Services Department incharge of SWM



## SOLID WASTE MANAGEMENT IN KAMPAR

- **LOCAL ACTION PLAN (2005 - 2020 ) for Waste Management** was formulated with assistance from JICA

**"Jom Pakat Kitar Semula"**



## Summary of Action Plan

- Overall project plan for each targets.



## Progress Report based on Action Plans presented at Networking Seminar in 2011

PLAN	STATUS
1. Establish compost centre in the market	DONE
2. Replicate household composting to 2 new communities	DONE
3. Implement training of trainers programme (university and school students)	DONE & ON GOING
4. Networking and dissemination of information in 13 local authorities	ON GOING

1. Establish compost centre at **market**  
→ landfill site & next to school as training centre



## Progress Report

2. Replication of composting in 2 new communities
  - **Sg Siput (S) : 60 houses ( New )**
  - **Gopeng Staff Quarters : 60 houses ( New )**
  - **Jeram New Village : 70 houses (on going)**
  - **Batu Putih New Village: 70 houses (on going)**





Replication of THM compost in Sg Siput south



Replication of THM compost Gopeng Quarters



Jeram New Village



REPLICATION THM



REPLICATION THM IN RESIDENTIAL AREA







3. Implement training of trainers programme (university and school students)



Trainers program ( university / college )

Trainers program ( 15 school )



Trainers program ( 15 school )



Promotion media





#### 4. Network + dissemination of information to 13 local authorities



## Impact of project

- Waste reduction ( approx 10% in project area)
- Reduce SWM cost (**transport + final disposal**)
- Final product of Compost Centre send to Parks and Recreational department : **reduce cost of soil conditioner** ( annual budget : RM 20,000)
- **Increase Awareness** among community → increase recycling rate
- Community area : **Cleaner + cheerful**

## Specific challenges face

Mindset + Attitude of community

Project Sustainability + technical problem

Federation of SWM



## Conclusion

- Solid Waste Management and Public Cleansing Act 2007 (Act 672), and Solid Waste Management and Public Cleansing Corporation Act 2007 (Act 673) will be enforce
- Putrajaya residents required to clean + source reduction ( Oct 2012)

**Mandatory sorting of SW at source**



## Recommendation

- THM composting Activities **will be further replicate** in other communities area and continue as an effort to compliment the Malaysian Government to segregate waste at source and as an approach to minimize waste
- JICA via IGES continue giving technical support to MDKpr
- Inviting other local authority in Perak, Malaysia which implementing THM initiatives in future seminar

**Terima Kasih**







Cebu City  
Government



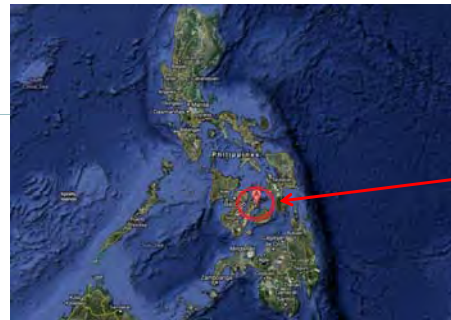
## Cebu City's Community-based Composting and Solid Waste Management

HON. NIDA C. CABRERA  
Cebu City Councillor



CEBU CITY GOVERNMENT

## Location and Profile



CEBU CITY GOVERNMENT



Population : 866,171 (NSO 2010)  
Daytime population : estimated at 1.5 million  
Total Land Area : 315.0 km<sup>2</sup>  
50 Urban Barangays  
30 Rural Barangays



CEBU CITY GOVERNMENT



- Second-largest center of business in the country.
- Among four premier cities in the country covered in a business risk assessment study (October 2011) by World Wide Fund for Nature Philippines (WWF), Cebu remains on top for Foreign Trade.
  - ❖ From \$396 Million in 1990, Cebu City's foreign trade exports exceeded \$1.527 Billion in 2008 – **3.85 times** in 20 years.
  - ❖ For imports, the city delivered growth from \$214 Million in 1990 to \$1.260 Billion in 2010 – **5.88 times** in 20 years.



CEBU CITY GOVERNMENT



- Lowest population growth rate of the four cities in the WWF study, at 1.41% over the 20-year period.
- Cebu leads other cities in Tourism
  - ❖ Over five years, the city's hotel room count has mushroomed from 2,864 rooms in 2005 to 4,126 rooms in 2010
  - ❖ Tourism Arrivals, 60% of which are domestic, increased by 58% over five years, from 1.12 Million in 2005 to 1.76 Million in 2010.



CEBU CITY GOVERNMENT



- barely 15% of the city's total land area sits on flat terrain
- uplands are also highly **vulnerable** to landslides from rainfall
- climate patterns indicate high inter-annual variability, with extreme weather events
- Cebu City will likely find itself caught in a "climate sandwich" as saltwater intrusion advances further, sea levels rise and more intense typhoons lash the coastline with storm surge.



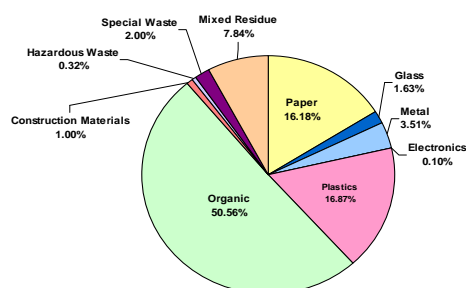


- The increasing urbanization of Cebu City coupled with the need to manage climate change impacts required a **systematic and comprehensive ecological solid waste management system** to ensure the protection of public health and environment.

## Policy Framework

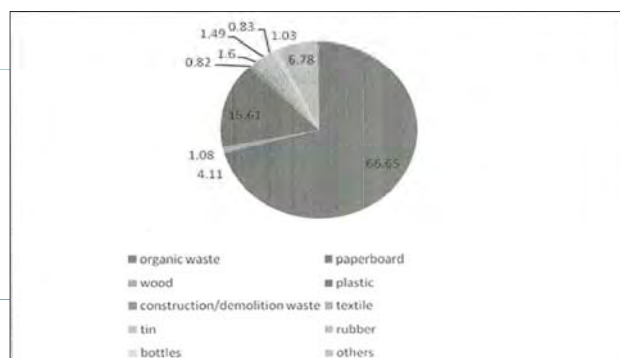
- Preservation & protection of the sources of life** – the trees, soil and water – and to focus on **sustainable development** in the fulfillment of human needs while maintaining the quality of the natural environment for the current generation and for the generations yet to come. – *City Ordinance No. 2243 or the Sustainable Development Ordinance of the City of Cebu*
- Solid Waste Segregation at Source** (*City Ordinance No. 2031*) that shall:
  - Resource conservation & recovery through re-use, recycling and recovery of wastes;
  - Solid waste volume reduction through source reduction and waste minimization measures such as **composting**, recycling, re-use and others;
  - Proper segregation, collection, transport, storage, treatment and disposal of solid wastes;
  - Effective enforcement by establishing a cooperation among non-governmental organizations, the private sector, the academe and other local government units.

## Waste Characterization



Cebu City Planning and Development Office (CPDO)  
Waste Analysis and Characterization Study (WACS) 2006

## Waste Characterization



Department of Public Services (DPS)  
Waste Analysis and Characterization Study (WACS) 2010

## Waste Composition by Sector (Source: CPDO, 2006)

Waste Types	Commercial	Residential	Commercial/Residential
Paper	17.41 %	13.43 %	19.18 %
Glass	0.80 %	1.60 %	1.76 %
Metal	3.89 %	2.82 %	4.04 %
Electronics	0.07 %	0.07 %	0.11 %
Plastics	18.86 %	18.22 %	16.40 %
Organic	50.38 %	54.65 %	45.19 %
Construction material	0.00 %	0.77 %	1.04 %
Hazardous	0.04 %	0.26 %	0.51 %
Special	1.15 %	1.90 %	2.62 %
Mixed residue	7.40 %	6.28 %	9.16 %

## How bad is our solid waste problem?



The Inayawan Sanitary Landfill

With a population of **866,171** (NSO, 2010) , almost **470,000** kilograms (or 470 tons) of wastes are generated in Cebu City a day.





CEBU CITY GOVERNMENT

## ADMINISTRATION OF SOLID WASTE MANAGEMENT

The Department of Public Services particularly the Solid Waste Management Division is in-charge of the collection and disposal of Municipal Solid Waste to the designated waste facility. Around 90% of Cebu City and roughly 95% of its constituents is covered under the service by the aforementioned department with the assistance of **Solid Waste Management Board** for technical and policy recommendations. The scope of implementation is based on the city's 5-year SWM Plan.



CEBU CITY GOVERNMENT

## Other Institutions Involved in SWM

Office/Dept./Org.	Function/Activities
Office of City Councilor Nida Cabrera	Legislating environmental-related laws/ordinances, including the conduct of researches (examples: household hazardous wastes; level of mercury contamination in the landfill); <i>Chairing the following committees: (1) Committee on Environment, and (2) Committee on Public Services; overseeing implementation of SWM programs at the city and barangay levels; monitoring proper collection of garbage; strengthening SWM at the barangay/community level through establishment of MRFs &amp; low-cost composting facilities [example: secured Php 55M grant from the Department of the Interior &amp; Local Government (DILG) for MRFs in the barangays.]</i>



CEBU CITY GOVERNMENT

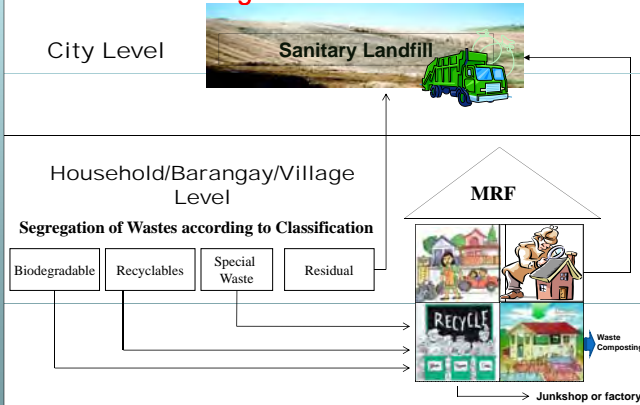
## Other Institutions Involved in SWM

Office/Dept./Org.	Function/Responsibilities
City Environmental Sanitation Enforcement Team (CESET)	Enforcement of local laws/ordinances on solid waste management such as City Ordinances 1361 and 2031, barangay Information & Education Campaign (IEC) and advocacy, apprehends indiscriminate garbage throwers and SWM ordinance violators.
Barangays	Garbage collection, transportation and disposal at landfill, barangay IEC and advocacy, implementation of SWM programs at the barangay level, coordinating with the city regarding implementation of SWM programs
NGOs/POs/Private sector	Provides trainings, IEC and advocacy on SWM, partnering with the city in the implementation of SWM programs, providing technical assistance to the city, community organizing, conducting regular cleanup activities



CEBU CITY GOVERNMENT

## Flow Chart: Management of Waste



CEBU CITY GOVERNMENT

## WASTE DISCHARGE

Cebu City is practicing the segregation at source in compliance to City Ordinance 2031 and Republic Act 9003.



## WASTE COLLECTION



As to the waste collection, the segregated waste from the households will be collected at the designated collection point in every barangay and then transported to the Transfer Station. After the final sorting and recovery of recyclables, the residual waste will then be transported to the designated and authorized waste disposal facility.

Schedule of Collection:

Biodegradable: Sunday, Monday, Wednesday & Friday

Non-Biodegradable: Tuesday, Thursday & Saturday

Residual: Everyday (on a separate container)



CEBU CITY GOVERNMENT

## SWEEPING AND CLEANING

The Department of Public Services hired street cleaners and assigned them to the designated areas to aid in the Clean and Green program in the City. The street cleaners can collect up to 60 tons of street waste per day and will rise up to 110 tons during the Sinulog Festival.

## COLLECTION AND TRANSPORTATION EQUIPMENT

There are 5 units of metal bins used at the transfer station for the hauling of wastes, 500 garbage plastic bins/receptacles and some units of tricycles.



**TRISIKAD Distribution**  
For BIODEGRADABLE WASTES  
COLLECTION







CEBU CITY GOVERNMENT

### WASTE TRANSPORT

The Department of Public Services is the office responsible for the Transport of waste from the designated collection point to the Transfer Station. While some Barangays who do have a functional garbage truck are in-charge of transporting wastes who is not included in the DPS collection point.



### INTERMEDIATE TREATMENT

30 Barangays from the North District and 20 Barangays from the South District have a material recovery facility. The Barangay composting program is achieved with the aid of Barangay Environment Officers and Bioman. Recently, the United Nations Environment Program and Development Academy of the Philippines pursued the Waste to Energy project through RDF Technology.



CEBU CITY GOVERNMENT



### RECYCLING



Door-to-door collection of recyclables in partnership with the registered waste scrap buyers in every barangay. While some barangays utilized waste materials for livelihood programs and projects.

### FINAL DISPOSAL SITE

After the cessation order from the Mayor of Cebu City, the existing Inawayan Sanitary Landfill serves as the Material Recovery Facility and Transfer Station. The final disposal site is a privately-owned landfill, Asian Energy Systems located at Polog, Municipality of Consolacion, Cebu.



CEBU CITY GOVERNMENT

### MEDICAL & HAZARDOUS WASTE

The Philippines Abatement Systems Specialists, Inc. (PASSI) is the private company that manages the toxic, hazardous and pathological wastes in the City.



CEBU CITY GOVERNMENT

### SWM SOCIAL ORGANIZATIONS

The Association of Barangay Councils (ABC), Public Markets, Cooperatives with Green initiatives, Cebu Chamber of Commerce and Industry and Business Sectors.

### TRAINING, EDUCATION, RESEARCH

The City Academe Network that comprises all of the Universities, Colleges and Schools in Cebu City are in-charge of the Information Dissemination Campaign. Research works are done by partners Alternatives to Development (A2D) and Department of Science and Technology.

### INFORMAL SECTOR

There are around 300 wastepickers in the Inawayan MRF who does the recovery of recyclables.



CEBU CITY GOVERNMENT

### CHALLENGES

- Over-capacitated Landfill
- Equipment Availability
- SWM is not prioritized by some Barangays
- Limited community involvement



CEBU CITY GOVERNMENT

### Strategies in Supporting Barangay MRFs & Composting

(1) **Strict Enforcement of Environmental Laws, especially the "No Segregation, No Collection" policy:** apprehension of violators – first 3 months of strict enforcement (April-July 2011) yielded 5,125 violators.

#### Schedule of Collection:

Biodegradable: Sunday, Monday, Wednesday & Friday

Non-Biodegradable: Tuesday, Thursday & Saturday

Residual: Everyday (on a separate container)

Office of the Mayor  
Cebu Environmental Sanitation Enforcement Team (CESET)  
CITATION TICKET No. 123456

• To: \_\_\_\_\_ Date: \_\_\_\_\_  
• Address: \_\_\_\_\_  
• Time: \_\_\_\_\_



## Strategies in Supporting Barangay MRFs & Composting

**(2) Creation of Barangay Environmental Officers (BEOs):** to enforce environmental laws at the barangay level, monitor proper garbage collection, assist in the establishment of materials recovery facility in the barangay and supervise modes of composting.

Five BEOs per barangay with the specific functions:

- 1 - Environment Coordinator Coordinate and orchestrate activities
- 1 - responsible for the Composting and
- 1 - responsible for the segregation recyclable materials.
- 2 - responsible for the accumulation biodegradable materials for composting (BIOMAN).

## Strategies in Supporting Barangay MRFs & Composting



Barangay Environmental Officers apprehending violators

## Strategies in Supporting Barangay MRFs & Composting

**(3) Training for BEOs, Capacity Building for Barangay Officials and Staff to Strengthen Barangay SWM Committees**



## Strategies in Supporting Barangay MRFs & Composting

**(4) Extensive Information and Education Campaign (IEC) for awareness on SWM laws & penalties for violations thereof**



## Strategies in Supporting Barangay MRFs & Composting

**(5) Financial Assistance to barangays for MRF establishment**



SWM Orientation For Barangay Officials and MOA Signing for Financial Assistance

## KALUNASAN Composting Facility





## KALUNASAN Composting Facility



CEBU CITY GOVERNMENT

### Strategies in Supporting Barangay MRFs & Composting

#### (6) Bioreactor and Shredder Machines Distribution to Barangays to Strengthen



CEBU CITY GOVERNMENT

### Strategies in Supporting Barangay MRFs & Composting

#### (7) Award System for Best Barangay

- Undertaken at the city level, with an annual award (monetary & certificates) bestowed upon barangays with best environmental practices.
- Several barangays also starting to replicate award at the "sitio" level.
- The business sector, through the Cebu Chamber of Commerce and Industry, Inc. (CCCCI), emulated practice by holding environmental awards among subdivisions.



CEBU CITY GOVERNMENT

### Strategies in Supporting Barangay MRFs & Composting

#### (8) Public-Private Partnerships

- Partnership with Cebu Chamber of Commerce and Industry, Shangri-La Mactan Resort, SM City Cebu and Ayala Center Cebu (malls), Local Markets (EchoStore in Serendra) and Non-Government Organizations (NGOs). International Markets through Sister Cities for marketing of products from waste. JICA involvement in the establishment of the Sanitary Landfill.



CEBU CITY GOVERNMENT

### Strategies in Supporting Barangay MRFs & Composting

#### (9) International Partnership

- Partnership with International Markets through Sister Cities for marketing of products from waste. Kitakyushu City, UNEP and JICA involvement in the establishment of the Sanitary Landfill.

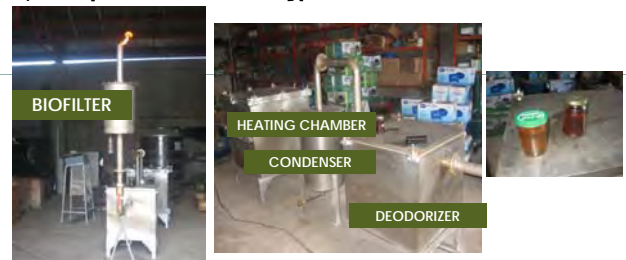


CEBU CITY GOVERNMENT

### Examples of International Partnership

WASTE-TO-ENERGY PILOT PROJECT (to address big volume of waste plastics generated, refer to "waste composition" slide)

#### a. Waste plastic to fuel technology





## Examples of International Partnership

WASTE-TO-ENERGY PILOT PROJECT (to address big volume of waste plastics generated, refer to "waste composition" slide)

### B. pelletizer



Shredded Coconut Husks

Shredded Mango Peels & Seeds

Shredded Plastic



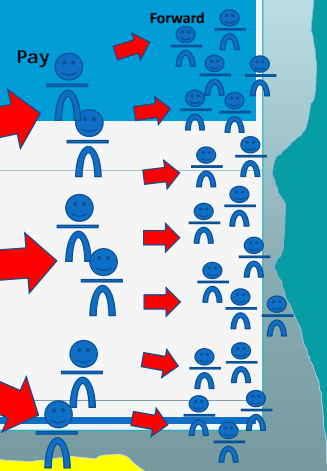
RDF

## TAKAKURA COMPOST PAY FORWARD SCHEME



Takakura Compost Center

Beneficiaries



## KitaQ System of Composting



### List of Barangays with MRF/Composting Facilities

North	Vermi	KitaQ-Facility	KitaQ-Basket
Adlaon	*		
Agsungot	*		
Apas	*		
Bacayan	*		
Banilad			*
Binaliw	*		
Budlaan	*		
Busay			*
Cambinocot	*		
Capitol Site	*	*	
Ermita	*		*
Guba	*	*	



### List of Barangays with MRF/Composting Facilities

North	Vermi	KitaQ-Facility	KitaQ-Basket
Hipodromo	*		
Kamagayan	*		
Kamputhaw	*		
Lahug	*		*
Lorega	*		
Luz	*	*	*
Mabini	*		
Mabolo			*
Malubog	*		
Pahina Central	*		*
Parian	*		

### List of Barangays with MRF/Composting Facilities

North	Vermi	KitaQ-Facility	KitaQ-Basket
Paril	*		
Pit-os	*		*
Pulang Bato	*		
San Jose	*		
San Roque			*
Sirao	*		
Sta. Cruz	*		
Sto. Nino	*		
T. Padilla	*		*
Talamban	*	*	*
Taptap	*		
Tinago	*		*

### List of Barangays with MRF/Composting Facilities

South	Vermi	KitaQ-Facility	KitaQ-Basket
Babag	*		
Basak Pardo	*		
Bonbon	*		
Buhisan	*		
Bulacao	*		
Buot Taup	*		
Cogon Pardo	*		
Guadalupe	*		
Inayawan	*		
Kalunasan	*	*	
Labangon	*		
Mambaling	*	*	

### List of Barangays with MRF/Composting Facilities

South	Vermi	KitaQ-Facility	KitaQ-Basket
Pamutan	*		
Poblacion Pardo	*		
Pasil	*	*	
Pung-ol Sibugay	*		
Quiot	*		*
Sapangdaku	*		
Suba	*		
Pasil	*		
Sudlon I	*		
Tabunan	*		
Tisa	*		

### List of Barangays with MRF/Composting Facilities

#### Summary

#### a) # of barangays with MRFs:

58 Barangays (35 North, 23 South)

72.5%

b) Vermi: 54 barangays

c) KitaQ-Facility: 7 barangays

d) KitaQ-Baskets: 13 barangays



### Waste Reduction due to City efforts

Reduction by 30% of total waste since assumption of office in year 2010;

Equivalent to 141,000 kilograms of waste reduction (or 141 tons) from a total of 470,000 kilograms (or 470 tons) of wastes generated daily in Cebu City.





## Other Economic and Social Benefits

## Recovery and Processing

- **Awareness** - people have become aware of the issues affecting environment and waste management as well as the benefits to their own families, community and their social relationships. Almost all segregate at source. Many are involved in recycling and composting, and savings through waste at different levels and groups. With the barangay clean, the people feel and act with dignity.



More women are doing Livelihood using waste.

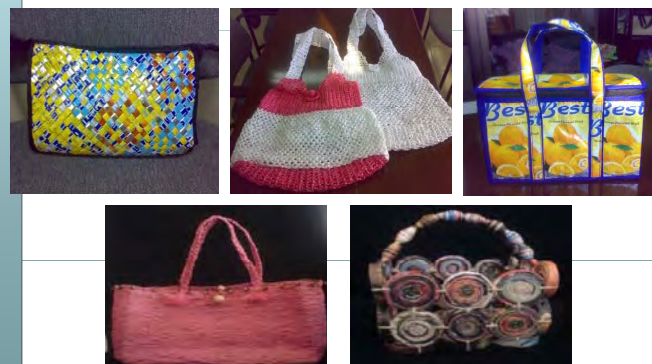
More people are involved in composting, using individual composting bin and condo type of composting.

## Kwarta Sa Basura Program

**Income generations and savings mobilization** through weekly waste buying through the establishment of 16 Bayanihan Centers and linking with the Barangay Luz Multipurpose cooperative for the savings (cash or waste), junk shops and tapping local and foreign contacts for recycled products.



## Product from wastes



## Mechanisms and Structure Set-up for Collection and *Transport of Waste*

- Regularizing garbage collections and Strict Law Enforcement



### Garbage Collections

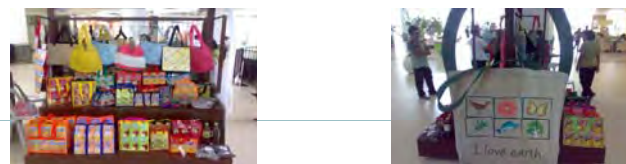
- **Timed collections of Garbage.**
- **Schedules for the collection of Biodegradable waste:** Monday, Wednesday, Friday and Sunday
- **Schedules for the collection of Non-Biodegradable Waste:** Tuesday, Thursday and Saturday.

**Strict enforcement of City Ordinance 1361 & 2031 and the Implementation of R.A. 9003.**

**Violations led to the following:**

- Fine from P500.00 to P1,000.00
- Render Community Service from 1 day to 1 week
- No Segregation No Collection

Linking and Setting up of Social Infrastructure for collaboration with and among Stakeholders for **Marketing and Sale**



- Business establishment like Ayala Center Cebu provided Market for Brgy. Luz recyclable products.



Tugkaran – the fruit of Brgy. Luz and Ayala Center Cebu Strong Partnership.





- Local and International networks were tapped to market recycled products.



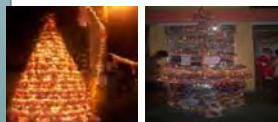
- NGO conducted livelihood training for the constituents.



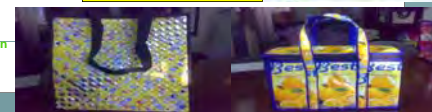
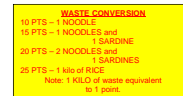
Improvements of Products from waste  
CIT-IE Department

- **Incentives to stake holders** such as : Annual search for the cleanest sitio; Recognition of individuals and Bayanihan centers who has the highest no. of kilo's of waste recycled per year and ; Annual search for marketable products from waste.

- \* **Clean & Green Contest for the Cleanest Sitio.**
- \* **Products from Waste Contest.**
- \* **Contest for the Highest Number of Kilos Segregated per Cluster.**
- \* **Contest for Sustainable & Manageable Composting Centers.**



**CHRISTMAS DECOR CONTEST**  
The activity is participated by all Bayanihan members. The contest promotes the use of recyclable materials in making Christmas Decor.



## The Barangay Luz ECO-Waste Center



The Main Entrance

## Butterfly Sanctuary



## The Herbal Plants



**Galing Pook**

Outstanding Local Governance Programs (for 2009)

### The Galing Pook

The Galing Pook awards is a government program that recognizes innovation and excellence in local governance.

**Vision**  
To be a leading national institution that promotes innovation, sustainability, and excellence in local governance.

**Mission**  
To provide assistance to local governments through capacity building, sharing of information and support of others to improve their performance in the local level.

The award program is intended to provide a platform for local government units to showcase their achievements and to provide a platform for them to learn from each other.

**The Partners**

ff  
The Department of the Philippines  
LANDRANK





**Barangay Luz, Cebu City**

### Participatory Environment Management

**T**heir mission is to make a difference. Their responsibility is to the entire open marketplace of humanity, not in California. They are managed to service local firms like the Ayala conglomerate to join and support their environmental governance program.

Harvard's researchers' conclusions began profiling their numbers, including savings, and comparing suburban pros.

events, materials and things that this type will be interested in, but led to the development of a program that can make money out of waste.

For decades, the people of Barroigay Sat struggled hard to acquire title to the land where they were relocated. In 1995, the Barroigay Sat Confederation of Community Organizations persuaded then Governor Lito Orosa to sell the land they occupied through the Community Mortgage Program. In the following years, the

recycling. Among the major problems they wanted to solve was solid waste disposal. While the city is mainly responsible for collecting garbage from major city streets, the boroughs are expected to collect waste from the inner streets and areas. The initial effort of the urban poor women's groups to recruit

sustainable community development program which entailed the participation of various stakeholders. The program aimed to develop public awareness about environment issues, waste management and related laws. It encouraged the residents to be responsible for their waste and to keep the environment clean and healthy.

To ensure the people's participation and involvement, a mass-media to focus, awareness-raising campaign on environment issues, waste management and related laws was conducted. Environmental and waste management concerns were also integrated into the Strategy Development Plan. Strategy realization (SR) was subsequently planned to implement national and the laws on waste management in the country. These include SR 11-225 which established the Bayanleng Savings program in 14 cities. The Bayanleng Savings scheme is a financing program being replicated by the DDO. The innovation in Bayanleng is that, instead of only recycled waste was accepted or disposed for municipal fees applications.

There were also mechanisms put in place to ensure participation. These include regular schedules for the collection of degradable and non-degradable waste and the establishment of an Eco-Center that serves as the materials recovery facility of the borough. The Eco-Center is also a demonstration area for composting as well as a wetland garden. There were also incentives such as the annual search for the cleanest city, formal recognition of individuals and neighborhood centers that have the most kilos of recycled waste per year and the annual search for marketable products from waste.

Values of the waste management indicators were found to be skewed to the right, suggesting that the "do segregation, do smelted" policy was partly sufficient, and the gaps were needed to make it consistent and comprehensive.

The various community action organizations (voluntary, profit and non-profit, often with government assistance) are actually involved in community organizing, identifying, organizing, recruiting, and mobilizing their own youth and groups. The treatment groups, which included the youth clubs, failed to monitor the response.

The Institute will also strive to give the engineering community with the Gulf Business Post, World Science and Technology a description of our work, and a LEAD document will appear in the September following describing the computing skills program (20 points). It will be furnished with government agencies like the Office of Information, Department of Environment and Natural Resources, and NOAA for information, also meeting or will be disseminated. It also received 10000

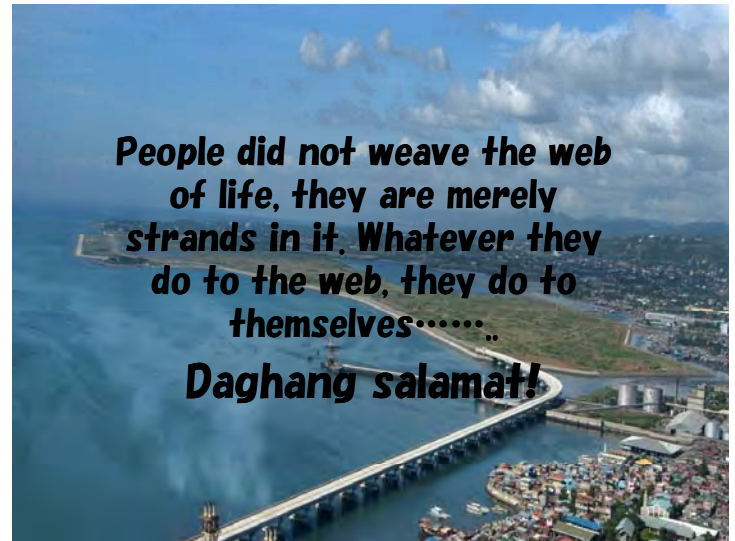
For their extensive network and expertise building on gender rights, housing, utilities, environment and governance, Local and International networks (e.g. Shreejita Foundation, Ayala Center, Flanders Region and Cofem Netherlands) were also utilized to find markets for recycled products.

Borongy has been turned into a model borongy for participatory environment management in the city as well as the country. It has gained several awards and has been invited to share and train other borongys, communities, local governments as well as schools and subdivisions within and outside the city wanting to replicate the program. The main ingredient in the

**Young Persons' Role in  
the Millennium**



Endring Post 2000 11



**People did not weave the web  
of life, they are merely  
strands in it. Whatever they  
do to the web, they do to  
themselves.....**

**Daghang salamat!**





## INTRODUCTION

**NAME** : MUHAMMAD JAYA MUSU  
**CITY** : MAKASSAR INDONESIA  
**COMPANY** : YAYASAN PEDULI NEGERI NGO  
<http://ypn-mks.blogspot.com/>  
**ADRESS** : JALAN KAKATUA II NO 15  
**TELPON** : +6285341585384  
**EMAIL** : jay\_tsunami@yahoo.com

## ABOUT MAKASSAR CITY

- Name of city : **MAKASSAR**
- Name the capital city : **MAKASSAR**
- Province : **SOUTH SULAWESI**
- Income / capita Year 2011 : **USD 27.420.000/jiwa**
- The total area of administration : **175.77 (km2)**  
 Beaches: **36.1 miles**
- The number of people in the administration of:  
**1,339,374 (soul).**

Makassar city consist of **14 districts**, with an average volume of about **600 tons** of garbage per day.



## SOLID WASTE MANAGEMENT SCENARIO

waste originating in the household on the container sorted waste sorting, organic waste in the blue container and an organic waste in a yellow container. households that already have the tools of organic waste is usually put into the basket for the magic Takakura composting process independently.

Then the waste is transported by officers to take to the waste treatment site. waste is managed in an organic waste bank while organic waste is managed in aerobic composter and magic Takakura baskets.



## COMPOSTING WITH MAGIC TAKAKURA BASKET





## PROCESSING OF ORGANIC WASTE BY AEROBIC COMPOSTER



## An organic waste management with garbage banks



## implementation of the 3R (reduce, reuse, recycle)

3r activities conducted at home with the policies of the government. institutions that provide the policy process is 3r Makassar city sanitation department. as a field executive for the monitoring of the country concerned is a foundation institution ngo.

foundation institute foundation to socialize the country concerned about the environment and also a method of composting in each target area



## socialization and environmental education with the 3Rs and composting methods



## ACTIVITIES TO REDUCE WASTE AND REUSING WASTE





## ACTIVITIES OF AN ORGANIC WASTE RECYCLING



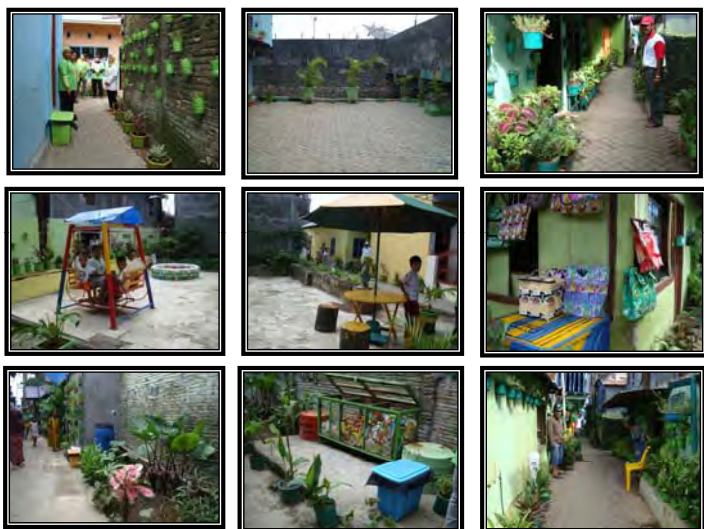
## conditions of the target area before given the socialization and education process 3R



## conditions of the target area after a process of socialization and education 3R







## SHARE LESSONS

### IDENTIFICATION OF SUCCESS FACTORS

starting from a familial approach to society, then form a group to learn and work. provide guidance on a regular basis, and cascade. cooperation with the government for giving awards to people who have made the change and innovation in the region.

### IDENTIFICATION OF BARRIERS AND CHALLENGES

Land area and number of target population in the region. adjustment time monitoring of the target area. Completeness of socialization and education materials and training aids that can be used.

## PROXIMITY TO COMMUNITY GROUPS IN THE TARGET REGION



## CONCLUSIONS AND RECOMMENDATIONS

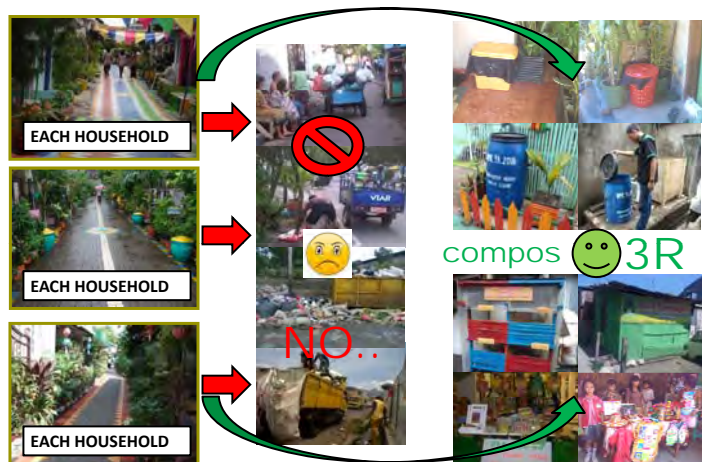
### 1. Conclusion

- 3r process can be carried out by each household and the target
- Composting can be done since in the household
- With the 3r and composting waste volume can be reduced

### 2. Recommendation

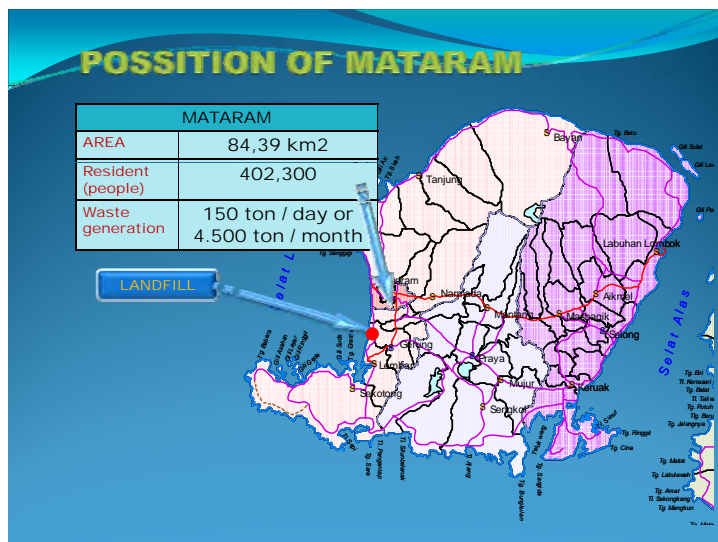
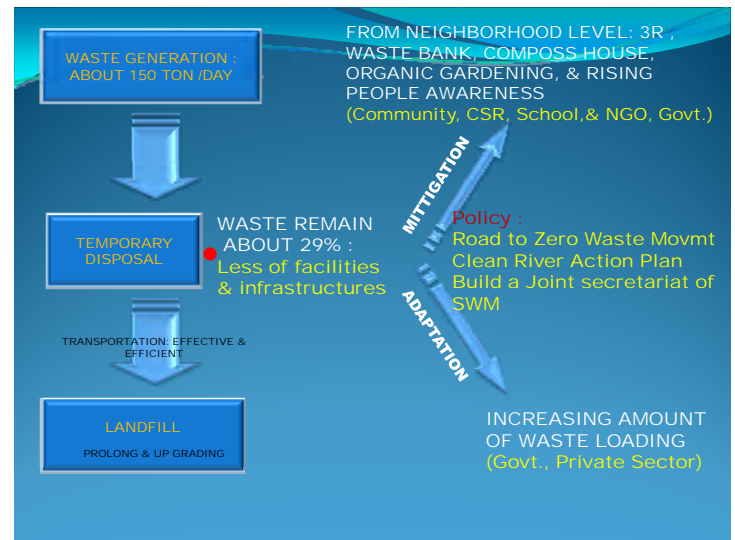
- very household has the tools and composting 3r
- Each region of the target bank has a waste management system
- 3r and the composting process is emphasized by the strict rules

## DREAM CITY OF MAKASSAR





INTERGATED SOLID WASTE  
MANAGEMENT IN MATARAM CITY







COMPOSTING IN NTB ENVIRONMENTAL AGENCY OFFICE, COLLABORATION WITH JICA JUNIOR EXPERTS (AIRI SAN, NISHI SAN AND SATOKO SAN)

## COMPOSTING IN GREEN SCHOOL PROGRAM BY NTB ENVIRONMENTAL AGENCY AND JICA JUNIOR EXPERT



## HANDAYANI

One of CBOs THAT FOSTERED BY SCBFWM Project, in Mataram City. kind of activities : build a hanging vegetable garden and making compost with conventional methods

Note: Strengthening Community Based Forest Watershed Management (SCBFWM), a project led by Ministry of Forestry under funding of UNDP and grant from GTZ

SCBFWM build a Master plan of Jangkok Watershed Management, Jangkok is the name of river that crossing Mataram City



Hanging vegetable garden



Jangkok river 2008



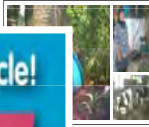
Jangkok river 2012

## CLEAN RIVER ACTION PLAN FOCUS ON JANGKOK RIVER BY NTB ENVIRONMENTAL AGENCY - 2012



## LOCALLY ACTION, GLOBALLY THINKING

Reduce, Reuse, Recycle!



ik Sapi, Bogor



Lubang Recapan Biopori



PLTS Bantar Gebang



Produk Daur Ulang



Don't let our earth like this!!!!



JOIN FOR ACTIONS



Terima Kasih



LET'S  
RESHAPING  
OUR EARTH  
BETTER



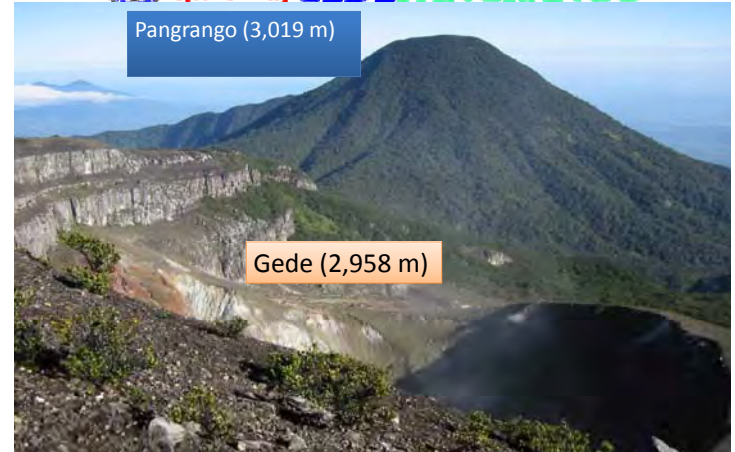


Name of City : CIANJUR-BOGOR

Submitting Institution : Mount Gede Pangrango National Park (MGNPN),  
MINISTRY OF FORESTRY

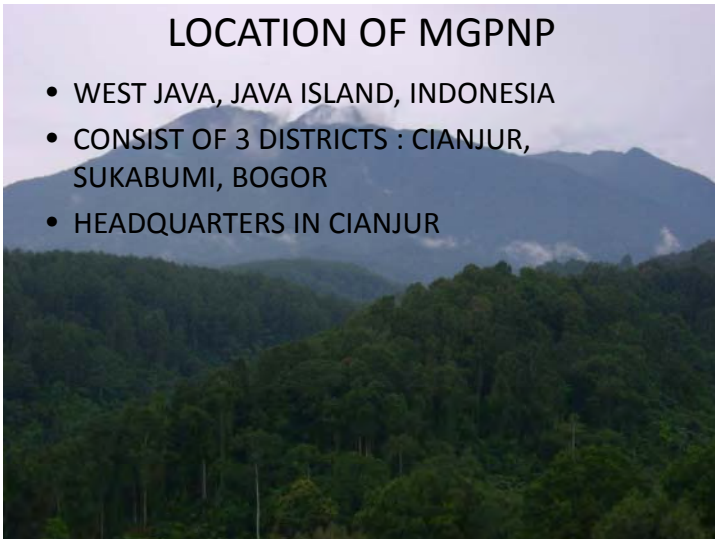
Contact Person : Tangguh Triprajawan (Mr)

Address : Cibodas Street PO BOX 3 SDL,  
Phone/fax : 0263 512776

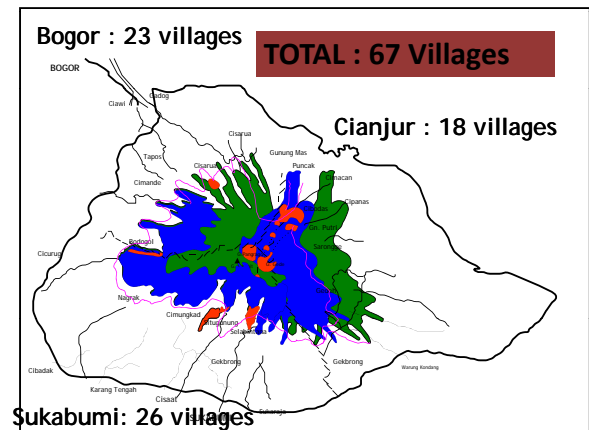


## LOCATION OF MGNPN

- WEST JAVA, JAVA ISLAND, INDONESIA
- CONSIST OF 3 DISTRICTS : CIANJUR, SUKABUMI, BOGOR
- HEADQUARTERS IN CIANJUR



## Rural Buffer



## COLABORATION IN WASTE MANAGEMENT IN RURAL BUFFER ZONE OF MGNPN



### PILOT PROJECT

- SUB VILLAGE : CISALOPA, VILLAGE : PASIR BUNCIR, DISTRICT : BOGOR
- MGNPN (Mr. TANGGUH), JICA JUNIOR EXPERT (Mr. KENICHI YOSHIDA), GREENA (Ms. NINA)

## OBJECTIVES

- RAISE ENVIRONMENTAL AWARENESS OF CHILDREN AND LOCAL COMMUNITIES
- REDUCING WASTE
- ADDITIONAL INCOME FROM SALES OF recycle products
- AVOID DEFORESTATION (COMMUNITY DEVELOPMENT)





## ACTIVITIES

- ENVIROMENTAL EDUCATION AT PRIMARY SCHOOL IN CISALOPA
- TAKAKURA COMPOSTING IN 10 HOUSE HOLD AS A PILOT PROJECT
- GREENA (NGO) EMPOWERING PEOPLE TO MANAGE WASTE MATERIALS (PLASTIC) THAT CAN BE SOLD AS recycle products





## CHALLENGES AND LESSONS

- District, province willingness to support, but how about village authority?
- How to scale out our actions in the other villages?
- COOPERATION AMONG JICA JE, MGPNP, GREENA NGO.
- Housewife's participation in composting and recycling activities.



Terima Kasih

Thank You







## PROMOTE FOR EFFICIENCY OF WASTE MANAGEMENT IN HANG TUAH JAYA MELAKA, MALAYSIA

MS. NOOR AZELIA BT AMER  
RESEARCH TECHNOLOGY, CONSTRUCTION AND INDUSTRIAL WASTE DIVISION  
SOLID WASTE MANAGEMENT AND PUBLIC CLEANSING CORPORATION  
MINISTRY OF HOUSING AND LOCAL GOVERNMENT

A Follow-Up Seminar On KITAQ System Composting In Asia  
JICA  
Kitakyushu, Japan  
17 – 21 July 2012



## ORGANISATION BACKGROUND



### SOLID WASTE MANAGEMENT AND PUBLIC CLEANSING CORPORATION ( PPSPPA )

- \* 2 Solid Waste Management Act has been enacted in Malaysia :
  - i ) Solid Waste and Public Cleansing Management Act 2007 (Act 672)
  - ii ) Solid Waste and Public Cleansing Management Corporation Act 2007 (Act 673)

\* Officially established on June 1, 2008

\* Corporation to enforce laws and regulate the concessionaires.

\* Solid waste management system for a comprehensive, integrated, cost effective and sustainable

## COOPERATION WITH JICA



### TITLE OF THE PROJECT :-

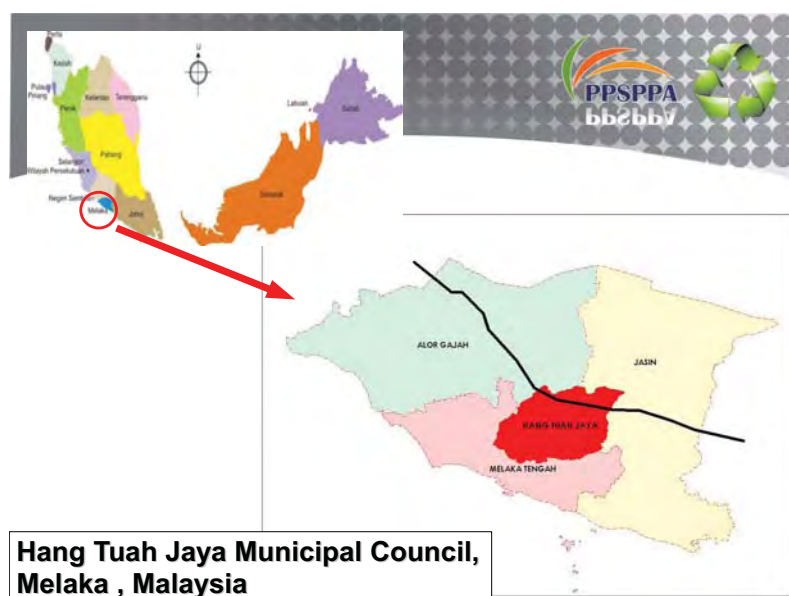
Promote efficient waste management system in Malaysia

### PROJECT PROPOSE :-

Hang Tuah Jaya has been identified to carry out a pilot project on integrated solid waste and public cleansing management

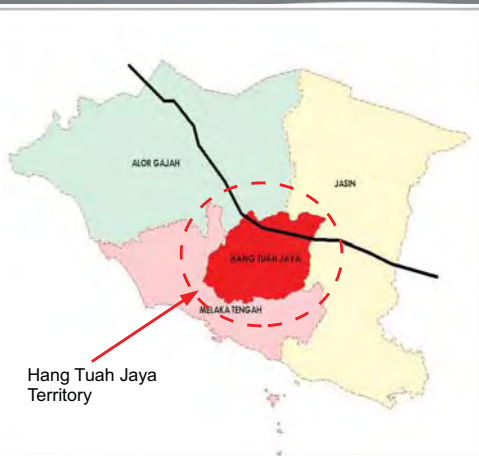
### EXPERTS FROM JAPAN WERE DISPATCHED TO HANG TUAH JAYA :

- Jul. 2011 – To grasp the actual state of Solid Waste Management In HTJ
- Sept. 2011 - To give technical guidance on organic waste composting for composting centers. Chemical analysis investigation of solid waste.
- Jan. 2012 - To introduce a community-based solid waste management system that focuses on organic waste composting technology
- Apr. 2012 - Follow-up visit to community composting



Hang Tuah Jaya Municipal Council,  
Melaka , Malaysia

## HANG TUAH JAYA MUNICIPAL COUNCIL (MPHTJ)



•Area : 144.6 km<sup>2</sup>  
(35,733.04 acres)

•Comprising part of three regions :  
i ) Central Melaka ( 14,247.76 acres )  
ii) Alor Gajah ( 8625.49 acres )  
iii) Jasin ( 12,859.79 acres )

•The population of the region is 114,732



## APPROXIMATE POPULATION IN HANG TUAH JAYA ( HTJ )



NO.	REGION	AREA ( Acres )	NUM. OF POPULATION	%
1	CENTRAL MELAKA ( 6 DISTRICT )	14,247.76	98,742	86.07
2	ALOR GAJAH ( 1 DISTRICT )	8,625.49	7,584	6.60
3	JASIN ( 1 DISTRICT )	12,859.79	8406	7.33
TOTAL		35,733.04	114,732	100



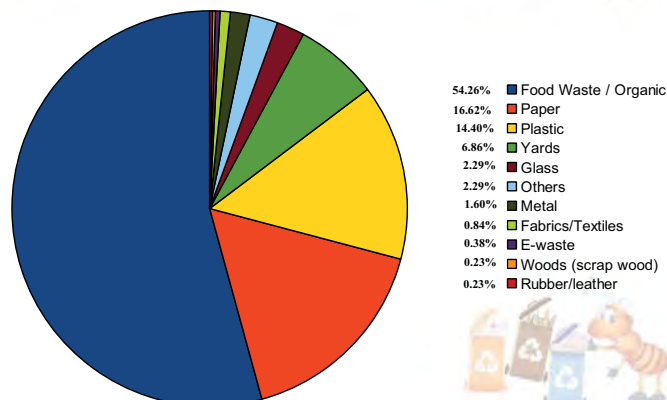


## SOLID WASTE GENERATION



BIL.	TYPE OF WASTE	WASTE GENERATION ( TONNE / YEAR )
1	Household waste	23,680
2	Recycles Items (plastics,cans and glass bottles from household)	9,472
3	Paper (from household)	0.473
4	Bulky waste (furniture, table, etc.)	2,368
5	Waste from market	7,104
6	Waste from canteen and restaurant	1,184
7	Waste from school	1,184
8	Waste from office	1,184
<b>Total</b>		<b>23,680.800</b>

## WASTE COMPOSITION



## VISION AND MISSION



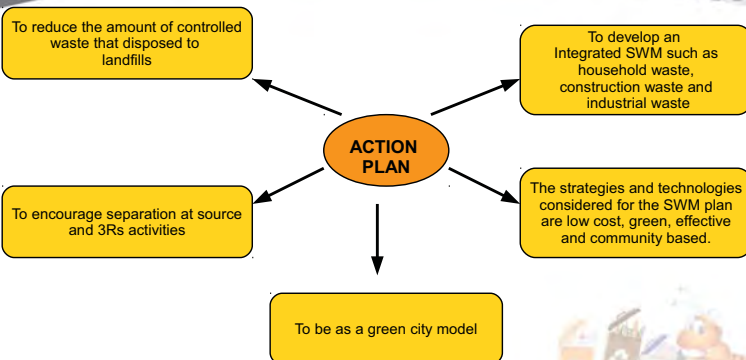
### Vision

To make Malaysia as a clean and prosperous country

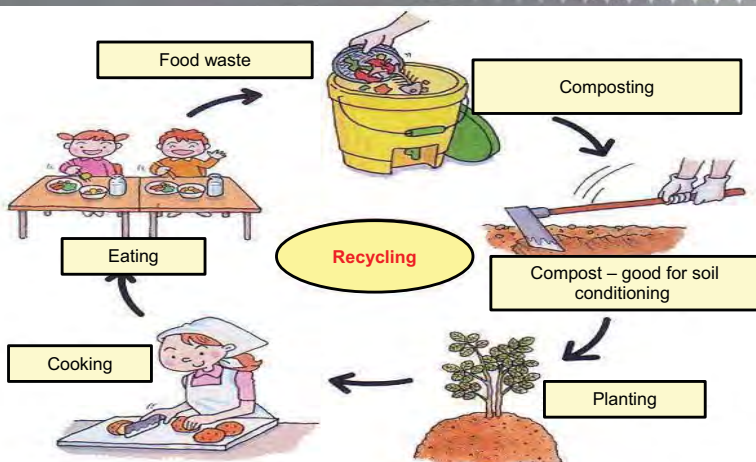
### Mission

Implement policies and strategies in the management of solid waste and cleaning of integrated and effective public through increased public awareness, use of new technology and enforcement laws to ensure a clean, healthy and sustainable

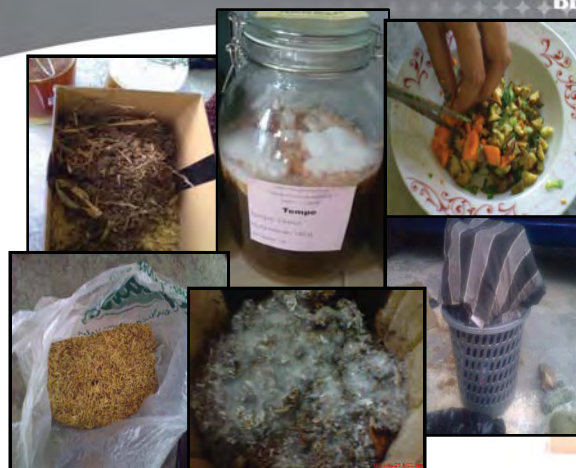
## SOLID WASTE MANAGEMENT PLAN



## LET'S COMPOST!



## TAKAKURA HOME METHOD



The Story Begin....



**STARTED IN OCTOBER 2009**



Internal training for PPSPPA technical staffs



Hands-On Training On Takakura Method Of Composting Organized by PPSPPA in Partnership with JICA  
7 – 8 Disember 2009

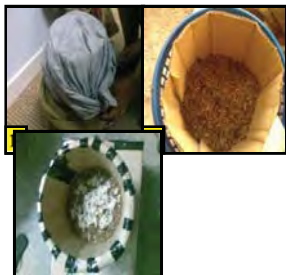


**COMMUNITY COMPOSTING AT HANG TUAH JAYA MELAKA**



**FOCUS!**

organic waste composting with participation of local communities

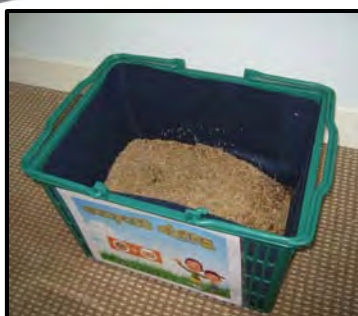


promote

Usage of household compost basket  
- more convenient  
- practical to use  
- cost effective



**COMPOST CHANG**



SEED COMPOST



INSTRUCTION / USER MANUAL

**THM - COMMUNITY COMPOSTING AT HANG TUAH JAYA MELAKA**



1 basket per household

BIL.	COMMUNITY	DATE STARTED	PROJECT DURATION	PARTICIPANTS	
				AS AT STARTED	CURRENT
1	Tmn Tasik Utama Ayer Keroh	24 Sept. 2011	9 month	24	12



**THM - COMMUNITY COMPOSTING AT HANG TUAH JAYA MELAKA**



1 basket per household

BIL.	COMMUNITY	DATE STARTED	PROJECT DURATION	PARTICIPANTS	
				AS AT STARTED	CURRENT
2	Kg. Paya Rumpit Jaya	5 Jan. 2012	5 month	30	30





## Kg. Paya Rumpit Jaya



## THM - COMMUNITY COMPOSTING AT HANG TUAH JAYA MELAKA

1 basket per household



BIL.	COMMUNITY	DATE STARTED	PROJECT DURATION	PARTICIPANTS	
				AS AT STARTED	CURRENT
3	Kpg. Batu Berendam	14 Mac 2012	3 month	9	3



## THM - COMMUNITY COMPOSTING AT HANG TUAH JAYA MELAKA

1 basket per household



BIL.	COMMUNITY	DATE STARTED	PROJECT DURATION	PARTICIPANTS	
				AS AT STARTED	CURRENT
4	Tmn Melaka Baru	15 April 2012	2 month	19	19



## INSTITUTIONAL COMPOSTING PROGRAMME



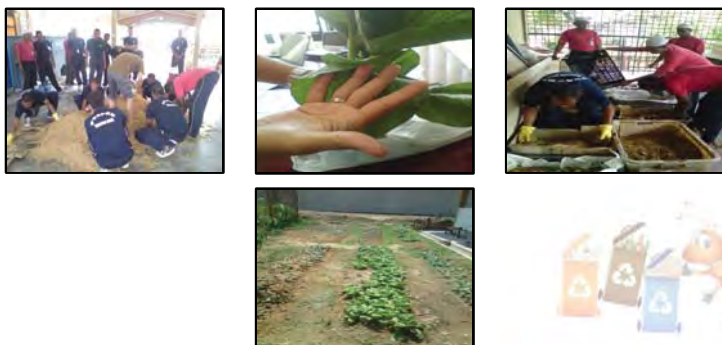
BIL.	INSTITUTIONS	DATE STARTED	PROJECT DURATION	PARTICIPANTS	
				AS AT STARTED	CURRENT
1	Sungai Udang Prison	14 January 2011	1 year 5 month	10	2



## INSTITUTIONAL COMPOSTING PROGRAMME



BIL.	INSTITUTIONS	DATE STARTED	PROJECT DURATION	PARTICIPANTS	
				AS AT STARTED	CURRENT
2	Narcotic Rehabilitation Centre ( PUSPEN )	10 Jun 2011	1 year	5	12



## INSTITUTIONAL COMPOSTING PROGRAMME



BIL.	INSTITUTIONS	DATE STARTED	PROJECT DURATION	PARTICIPANTS	
				AS AT STARTED	CURRENT
3	Old Folks Home Kenanga	7 February 2012	4 month	10	10





## INSTITUTIONAL COMPOSTING PROGRAMME



BIL.	INSTITUTIONS	DATE STARTED	PROJECT DURATION	PARTICIPANTS (TEACHERS AND SCIENCE CLUB)	
				AS AT STARTED	CURRENT
4	Batu Berendam Primary School	2 April 2012	2 month	10	10



## INSTITUTIONAL COMPOSTING PROGRAMME



BIL.	INSTITUTIONS	DATE STARTED	PROJECT DURATION	PARTICIPANTS (TEACHERS AND SCIENCE CLUB)	
				AS AT STARTED	CURRENT
5	Tamil Ladang Primary School Bukit Kajang	9 April 2012	2 month	10	10



## INSTITUTIONAL COMPOSTING PROGRAMME



BIL.	INSTITUTIONS	DATE STARTED	PROJECT DURATION	PARTICIPANTS (AGRICULTURAL STUDENTS)	
				AS AT STARTED	CURRENT
6	Iskandar Shah Secondary School	9 April 2012	2 month	10	10



Hasilkan baja kompos daripada sisa makanan, tumbuhan diperluas



Kaedah pengkomposan berhasil



## MONITORING



\* Compost Team Coach brought to monitor and assist in terms of technically if the *compost chang* who have experienced problems such as odor problems or wormy.

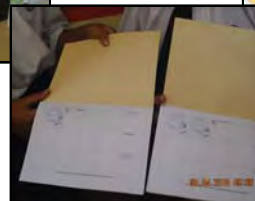
\* Creating user information contains the date of commencement exercise compost, the estimated amount of food waste that was composted as information foundation that will serve as references.



## OVERALL ACHIEVEMENT OF TOTAL RECYCLABLES COLLECTED BY THE RECYCLING BANK AT 8 SCHOOL HELD IN 2011



Bil.	State	Programs	Recyclables Collected (kg)	Selling Amount (RM)
1	Melaka	Recycling Bank at School	4,794.01	2,063.43





## TARGET FOR RECYCLE PROGRAMS IN 2012



NO	PROGRAM	TARGET
1	Recycling Bank at Kindergarten	10 Kindergartens
2	Recycling Bank at School	13 Schools
3	Waste Separation at Source for Household Area	1 Household Area / Community
4	Waste Separation at Source for Government Agencies	1 Government Agencies
5	Composting Activities	1 Demonstrating Program
6	Drive-Thru Recycle Activities at Mall	1 Mall
7	Recycle Talks	20 Talks
8	Exhibition	12 Exhibitions



# THANK YOU







**Badulla City**  
**Badulla Municipal Council**



**Upali Nishshanka Gunasekara.**

**Mayor of Badulla.**

**Municipal Council Badulla**

**055-2222275**

**ungmcb@gmail.com**



- **Badulla; the capital of the Uva Province is about 230 km away from Colombo towards the Eastern slopes of the Central hills of Sri Lanka.**
- **Badulla is encircled by the “Badulu Oya” which enriches Mahawali River**



PROVINCE	Uva
DISTRICT	Badulla
AREA	1036 Hectare
CITY BOUNDARY	10.0km <sup>2</sup>
INSTITUTION	Municipal Council, Badulla
FULL POPULATION IN THE MC BOUNDARY	45,096
No. of Estimated Family Units	9105
Rate of population	1.07
Main Schools	17
Private Educational institutes	22
Business	1930
Building Applications approved annually	258







Annual amount for the SWM	Rs.37247000.00
Approved laborers for the SWM	84
Laborers engaged in the project	80
Amount to move one ton of solid waste	Rs.2459.00



### Details regarding the SWM

The ways of collecting Solid Waste	Collecting garbage by visiting each and every building
Solid Waste collected per day	20-25 tons.
Amount of laborers in the project.	80
Method of the collection	Collecting garbage by tractors without classifying.



## Reduce

Introducing Compost Bins.



## Reuse





## Recycle



Presently we are only collecting Solid Waste in the Urban area.

For the Non Urban Area we have introduced home Composting.

We have prepared Solid Waste Management Policy But not yet implemented.



## Former Situation of the City.





Existing Solid Waste  
Programme  
Supported by "Pilisaru Project"  
&  
JICA









## Success Factors



Composting Programme completely changed the Former situation of the Badulla City.

Earning Money for the Council Fund.

Creating new employments for the city workers.

## Barriers and Challenges



Existing site is going to develop as playground .



Surrounding Area is covered by Schools, Playgrounds, and Houses.

Bad Odour .

## External Assistance



Technical Assistance.

More Training for the staff and workers.

# Thank You







# Solid Waste Management of UC Kuliyaipitiya

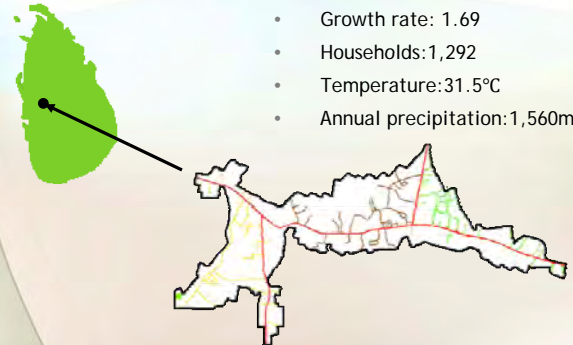
ශ්‍රී ලංකා ප්‍රජාතාන්ත්‍රික සමාජවාදී ජනරජය  
දකුණු පළාත  
කුලියාපිටිය නගර සභා

Urban Council Kuliyaipitiya, SRI LANKA



## Introduction of Kuliyaipitiya

- Area: 3.8 sq. km
- Population: 12,944 (living: 6,743)
- Growth rate: 1.69
- Households: 1,292
- Temperature: 31.5°C
- Annual precipitation: 1,560mm



## Overview of SWM

- Revenue: Rs.616,300, collected by UC Kuliyaipitiya for waste collection, which is based on the 3% of the annual in 2011.
- Expenditure of SWM: Rs.1,054,620 in 2011 (2009:Rs.9,529,750, 2010:Rs.37,619,300)
- Amount of total waste generation per day: 9-10t (2009:6-7t, 2010:7-8t)



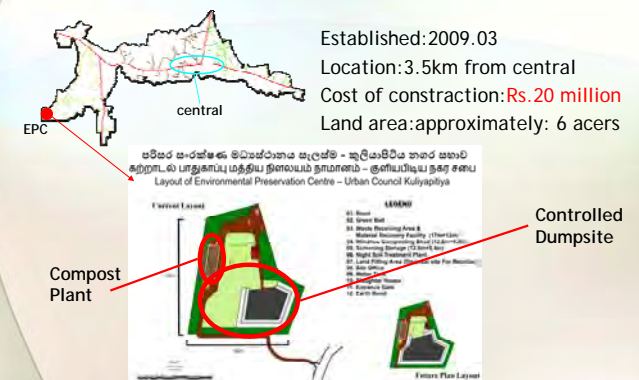
## Waste composition in Kuliyaipitiya



## Waste management in Kuliyaipitiya -method of collection



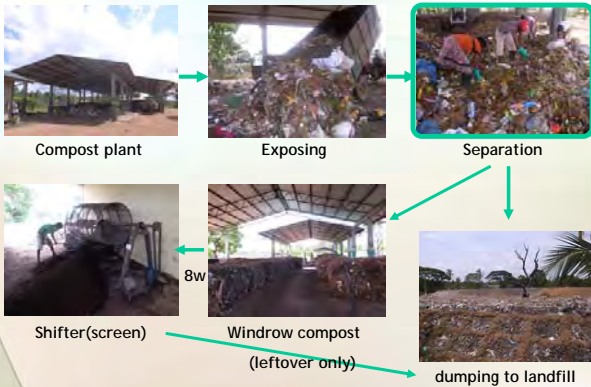
## Layout of Compost Plant & Dump Site (Environmental Preservation Center)



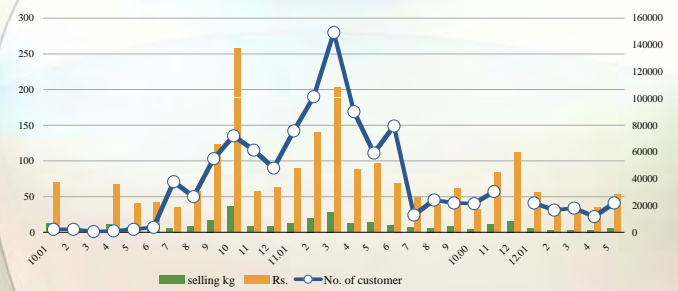




## Compost Plant



## Compost fertilizer



## Recent problems to be solved (Action Plan for two years)

- starting sorted collection all over the city
- improvement of recycle system → **environmental education at school & community**
- changing general behavior of citizens → **environmental education at school & community**
- reducing quantity of waste from household → **TAKAKURA method & improving recycle system**



බොහෝම ස්තූතියි

ありがとうございます。

Thank you very much.

Presented by  
Lakshman Adikari,  
Chairman of Kuliyaipitiya UC  
[kuliyauc@sltnet.lk](mailto:kuliyauc@sltnet.lk)  
[lakshman.adikari@gmail.com](mailto:lakshman.adikari@gmail.com)



## A Follow-up Seminar on KITAQ System Composting in Asia

# Solid Waste Management Project, Republic of Perú

Ministry of Environment  
Eng. Miriam Arista

Av. Javier Prado Oeste 1440, San Isidro, Lima-Perú

www.minam.gob.pe

## Introduction

"The status of management of solid waste is critical"

**Causes:** Population growth, inadequate consumption habits, migration and trade flows disordered unsustainable.

**Population:** 2,834,639

**Waste generation per capita average:** 0,602 kg per capita / day.

**Total solid municipal waste** 17201 tn/ day.

**Scope** ( from total generation)

50% Organic waste

26% Landfill

15% Reuse, this takes place during the collection and disposal, mostly informally.

**Cost service**

Ranging from S/. 0.34 and S / 12.33 per household / month.  
Average non-payment 67%.

www.minam.gob.pe

## Policy towards implementation 3Rs

- Law N° 27314, General Law on Solid Waste, Article 10  
Municipalities progressively implemented programs segregation at the source of solid waste.
- "National Environmental Action Plan-PLANAA 2011-2021" approved by SD 014-2011-MINAM, contains environmental priority goals for the next 10 years, which sets national targets of 60% recycling and 70% coverage of safe disposal of municipal solid waste by 2017 and by 2021 100% in both strategic actions.
- Additional Resources for municipalities that implement a program segregation at source and separate collection of solid waste, approved by Supreme Decree 004-2012-EF, Ministry of Economy and Finance.

www.minam.gob.pe

## Project

It covers 31 cities in 16 regions of Perú, which gives the program nationally representative

National Reach

Selected Cities



▲ JICA (23)

• Tumbes

• Piura

• Sullana

• Tarma

• Paita

• Sechura

• Puno

• Juliaca

• Azangaro

• Ilave

• Abancay

• Puerto Maldonado

• Huánuco

• Moyobamba

• Tarapoto

• Chinchipe

• Huacho

• Nuevo Chimbote

• Ferreñafe

• Tarma

• Chachapoyas

• Santiago

• Ayacucho

▲ BID (08)

• Bagua

• San Juan Bautista

• Oxapampa

• Pozuzo

• Huamanga

• Andahuaylas

• Yauyos

• Chancay

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## Project

Description

The Project considers the following components: storage and sweeping, collection and transportation, reuse, disposal, administrative and financial management and practices aimed at the population.

### Composting plants

Initially will treat waste from markets

Use Mini wheel loader, treat more than 7tn/day will use vibrating screens

Construction; year 2 or year 5

### Separation of recoverable materials plant

Sizing subject to receiving (20%, 40% and 60% of waste) according large, medium and small cities.

The operation of these plants is manual

Construction; year 0

Both, two-year pilot phase

### Success factors in promoting sustainable composting programs (SCP):

• Market for final product

• Product Quality

• Communication and information campaigns

Barriers and challenges in promoting SCP

• Lengthy processing

• Unpleasant odors

• Partial subsidy

• Mixed solid waste

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## Conclusions and Recommendations

- The project will ensure the proper management of solid waste, improving environmental quality and reducing the risks of health on population, promoting the sustainable development process in the country.
- The project involves the integrated management of solid waste that is applied to all stages of handling solid waste from its generation, based on environmental health criteria and technical and economic feasibility for source reduction, recycling and disposal of solid waste.
- Key factors in composting: Planning and financial management, selective collection and plan communication and information.

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# Introduction to the municipal waste administration

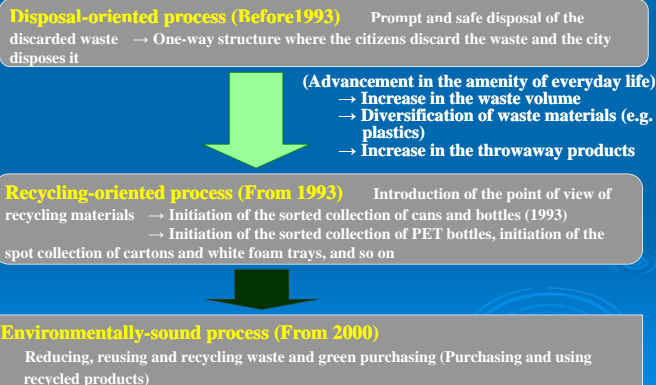
City of Kitakyushu Environment Bureau  
Resource Circulation Division,  
Resource Circulation Department

1. What is waste?
2. History of Japan's waste administration
3. Waste administration of Kitakyushu City

- (1) Kitakyushu City's view on the waste treatment
- (2) Waste treated by Kitakyushu City
- (3) Handling of waste other than the waste collected by the administration
- (4) Toward further reduction of the domestic-related waste
- (5) The latest situation and the challenges of Kitakyushu City

## (1) Kitakyushu City's view on the waste treatment

### > Transition of the view



## Basic view on the sorting and recycling of waste

1. Understandability for the citizens  
→ To refrain from classifying too precisely to sort
2. Establishment of the recycling technology, demand for the recycled products  
→ Materials would not be recycled without a recycling mechanism.
3. Efficiency including the cost performance  
To make maximum use of the private and citizens' collection routes  
→ The cost for collection would increase along with the increase in the kinds to be sorted.

## (2) Waste collected by Kitakyushu City

- > Household-related waste (twice a week) (50-yen charge/45 liter bag)  
→ Garbage, waste paper, plastic products, etc.
- > Bulky waste (once a month) (300-yen to 1000-yen charge)  
→ Furniture, bedclothes, etc.
- > Plastic containers and packaging (once a week) (12-yen charge/25 liter bag)
- > Cans, bottles and PET bottles (once a week) (12-yen charge/25 liter bag)
- > Cartons, food trays, small metallic articles, fluorescent tubes (from time to time)  
(Into the collection boxes placed in the supermarkets etc. in the city)
- > Brought-in waste (100-yen charge/10kg)  
→ Waste brought into the facilities of the city by enterprises or collection and transportation businesses (700-yen charge/100kg before October, 2004)

## Destination of Resources and Garbage





## ① Flow of the household-related waste treatment

From the collection and transportation to the incineration and final disposal

## Designated bags of household-related waste

- Take recyclable resources and garbage to designated stations by 8:30 AM on collection days in specified methods.
- Specified bags are sold at supermarkets and convenience stores.

Household Garbage	Cans and bottles	Plastic bottles	Plastic containers and packages
<ul style="list-style-type: none"> <li>● Kitchen garbage</li> <li>● Grass</li> <li>● Pottery</li> <li>● Clothes/ Cloth</li> </ul>	<ul style="list-style-type: none"> <li>● Cans and bottles</li> </ul>	<ul style="list-style-type: none"> <li>● Plastic bottles</li> </ul>	<ul style="list-style-type: none"> <li>● Plastic containers and packages</li> </ul>
<ul style="list-style-type: none"> <li>● Collection days: Twice a week (Mon and Thu or Tue and Fri)</li> <li>● Collection place: Household Garbage Station</li> </ul>	<ul style="list-style-type: none"> <li>● Collection days: Every Wednesday</li> <li>● Collection place: Recycling Station</li> </ul>	<ul style="list-style-type: none"> <li>● Collection days: Every Wednesday</li> <li>● Collection place: Recycling Station</li> </ul>	<ul style="list-style-type: none"> <li>● Collection days: Once a week (specified day in your area)</li> <li>● Collection place: Recycling Station</li> </ul>
<ul style="list-style-type: none"> <li>● Prices: Large (Tin, 45-liter bag): 500 yen</li> <li>Medium (Tin, 30-liter bag): 330 yen</li> <li>Small (Tin, 20-liter bag): 220 yen</li> <li>Extra small (Tin, 10-liter bag): 110 yen</li> </ul>	<ul style="list-style-type: none"> <li>● Prices: Five, 25-liter bag: 60 yen</li> </ul>	<ul style="list-style-type: none"> <li>● Prices: Five, 25-liter bag: 60 yen</li> </ul>	<ul style="list-style-type: none"> <li>● Prices: Large (Tin, 45-liter bag): 100 yen</li> <li>Small (Tin, 25-liter bag): 60 yen</li> </ul>

※ The Recycling Station is where cans, bottles, and plastic bottles are put out.

## Waste-collection point (Gomi station)



## A scene of collection of the household-related waste



Refuse truck



## Incineration Plants

Shinmoji Incineration Plant

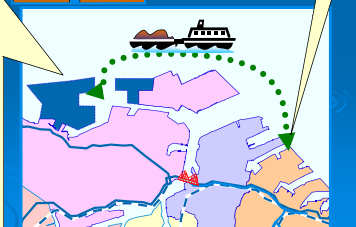
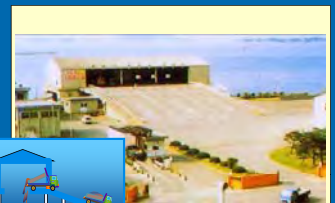


Total amount of waste Incinerated at three plants in the city: 2,130t/d

Utilizing excess heat for electric power generation: 192,000MWh / Y (FY 2008)

Revenue by Power Generation: ¥752million (FY 2008)

## Final disposal of waste





## ② Sorted Collection of Recyclable Materials 1

→ Waste collection in the paid designated bag – once a week

(Materials brought by the citizens in the designated bag to the recycling material station will be collected)

1. Cans and bottles
2. PET bottles
3. Plastic containers/packaging

## Designated bags of recyclable waste

- Take recyclable resources and garbage to designated stations by 8:30 AM on collection days in specified methods.
- Specified bags are sold at supermarkets and convenience stores.

Household Garbage	Cans and bottles	Plastic bottles	Plastic containers and packages
 <ul style="list-style-type: none"> <li>● Collection days: Twice a week (Mon. and Thu. or Tue. and Fri.)</li> <li>● Collection place: Household Garbage Station</li> <li>● Prices: <ul style="list-style-type: none"> <li>Large (for 45-liter bags): 500 yen</li> <li>Medium (for 30-liter bags): 330 yen</li> <li>Small (for 20-liter bags): 220 yen</li> <li>Extra small (for 10-liter bags): 110 yen</li> </ul> </li> </ul>	 <ul style="list-style-type: none"> <li>● Collection days: Every Wednesday</li> <li>● Collection place: Recycling Station</li> <li>● Prices: <ul style="list-style-type: none"> <li>Five, 25-liter bags: 60 yen</li> </ul> </li> </ul>	 <ul style="list-style-type: none"> <li>● Collection days: Every Wednesday</li> <li>● Collection place: Recycling Station</li> <li>● Prices: <ul style="list-style-type: none"> <li>Five, 25-liter bags: 60 yen</li> </ul> </li> </ul>	 <ul style="list-style-type: none"> <li>● Collection days: Once a week (specified day in your area)</li> <li>● Collection place: Recycling Station</li> <li>● Prices: <ul style="list-style-type: none"> <li>Large (for 45-liter bags): 100 yen</li> <li>Small (for 25-liter bags): 60 yen</li> </ul> </li> </ul>

※ The Recycling Station is where cans, bottles, and plastic bottles are put out.

## Plastic Containers/Packaging



This symbol is the marker. Those are the plastic containers and packaging that become waste when the contents in them are used up.

Cups and packages	Bottles	Bags and cellophane wraps
 <ul style="list-style-type: none"> <li>● Egg package</li> <li>● Tofu package</li> <li>● Noodle container</li> <li>● Bag of convenience store lunch</li> <li>● Others</li> </ul>	 <ul style="list-style-type: none"> <li>● Shampoo bottle</li> <li>● Detergent bottle</li> <li>● Sauce bottle</li> <li>● Food oil bottle</li> <li>● Others</li> </ul>	 <ul style="list-style-type: none"> <li>● Shopping bag</li> <li>● Bread bag</li> <li>● Confectionery bag</li> <li>● Bag for gardening supply</li> <li>● Others</li> </ul>
Tubes	Cushioning materials	Plastic caps
 <ul style="list-style-type: none"> <li>● Mayonnaise container</li> <li>● Toothpaste tube</li> <li>● Paste spice tube</li> </ul>	 <ul style="list-style-type: none"> <li>● Cushioning material for home appliances</li> </ul>	 <ul style="list-style-type: none"> <li>● Cap of PET bottle, etc.</li> </ul>

\* Those not the object of sorting as “plastic containers and packaging”  
 • Plastic goods other than containers or packaging  
 Examples: Plastic goods such as video tape, toy, washbowl, etc.

## Collection spots of the recyclable waste (Cans, bottles, PET bottles and plastic containers and packaging)



## A scene of separation of the recyclable waste



Cans and bottles recycling center



Plastics recycling center

## ③ Sorted Collection of Recyclable Materials 2

→ Things collected in special collection boxes placed at different locations such as certain supermarkets in the city.

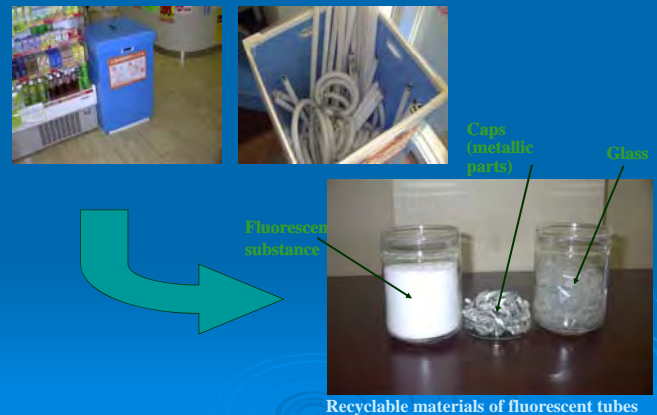
1. Cartons and trays
2. Fluorescent tubes
3. Metal objects (pots, kettles, etc)



### Collection box of food tray at supermarket



### Recycling of fluorescent tubes



Recyclable materials of fluorescent tubes

### A collection box of small metallic articles



### (3) Local Efforts for Recycling Domestic Garbage

- ① **Waste paper**  
(Subsidizing 7yen/kg for the collection by the local volunteer organizations (depending on collection methods). The organizations also collect waste cloth and reused bottles.)
- ② **Composting of food waste**  
(Composting domestic food waste and utilize manure at schools or parks to grow flowers, etc.)
- ③ **Pruned branches/mowed grass**  
(Partially collected by the neighborhood associations to be composted after being used in factories as spread under the livestock)
- ④ **Waste food oil**  
(Partially collected by the neighborhood associations and used as fuel for the waste collection vehicles after refinement.)

### ① Promotion of group activities of waste paper recovery

- Waste paper includes;  
Waste newspaper, magazines, cardboards, miscellaneous paper (paper boxes, etc.)
- Financial incentives for the group activities of resource recovery  
Recovery at the squares and the stations  
--- 7 yen/kg for the recovering group  
Recovery from house to house (under the eaves)  
--- 5 yen/kg for the recovering group
- Lending of a depository for the recovered waste paper

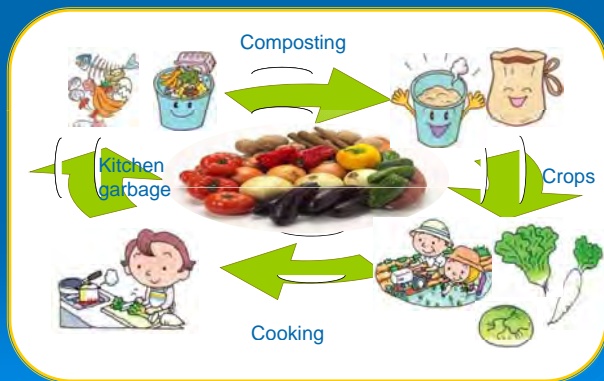


### Promotion of Waste Reduction & Recycle





## Seminar about how to utilize composting container for kitchen garbage



## Promotion of Waste Reduction & Recycle ~Composting project by School~



## ③ The pruned branch (green) recycling program

- Application to the city by each of the neighborhood associations or autonomous communities (with around 100 or more households)
- Cost for collection, transportation and disposal to be borne by the city
- Subject to collection are the branches pruned by the homes, grass and leaves of trees.
- Concerted efforts of the community
  - Public relations on the date and place of collection
  - Setting of the place of collection, making the rounds
  - Cleaning of the place of collection
  - Temporary keeping of the collection bags



## Pruned branch recycling process



## ④ The waste cooking oil recycling program

- **Collection boxes (17places)**  
Waste cooking oil always to be brought to the predetermined box (The city installs collection boxes and bear the cost for treatment.)



## City of Kitakyushu Fundamental Plan for Establishing a Sound Material-Cycle Society

### Purpose of formulating the fundamental plan

Towards the realization of a sustainable society, the plan describes the vision for pioneering solid waste administration that integrates approaches to achieving a "low-carbon" "natural symbiosis" society into the conventional approach to establishing a "sound material-cycle society."



### Plan period

10 years from FY2011 to FY2020

### Relevance to other plans

The plan constitutes the Municipal Solid Waste Management Plan whose formulation is stipulated by Waste Disposal and Public Cleansing Law, as well as a sectional plan of the City of Kitakyushu Basic Environment Plan

### Object of the plan

All waste including municipal solid waste and industrial waste



## Expected roles of stakeholders

### <Residents>

- Enhanced efforts to alter their lifestyle
- Participation and cooperation for environmental learning/conservation activities

### <NPOs>

- Taking positive actions such as "group collection" of recyclables
- Playing the role of interfacing different bodies to facilitate their partnership and collaboration
- Conducting environmental learning, social business, etc.

### <Businesses>

- Fulfillment of corporate social responsibilities
- Promotion of the further disclosure of information

### <Local government>

- Promoting actions by different bodies by acting as a coordinator
- Implementing schemes in accordance with regional characteristics
- Taking the initiative in making sustainable efforts

Cooperation  
&  
Partnership

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## Goals of the plan

### 《Municipal solid waste》

- ◆ Amount of domestic waste per person per day  
2009 : 506g ⇒ **2020 : 470g or less**
- ◆ Recycling rate  
2009 : 30.4% ⇒ **2020 : 35% or more**
- ◆ CO<sub>2</sub> emissions caused by municipal solid waste treatment  
2009 : 122,000 t-CO<sub>2</sub> ⇒ **2020 : 100,000 t-CO<sub>2</sub> or less**

### 《Industrial waste》

- ◆ Promoting the proper treatment of industrial waste and reducing the amount of final waste disposal in the city

### 《Domestic wastewater》

2009 : 99.2% ⇒ **2020 : 99.4% or more**

32

## Work flow of seminar on how to utilize composting container for kitchen garbage



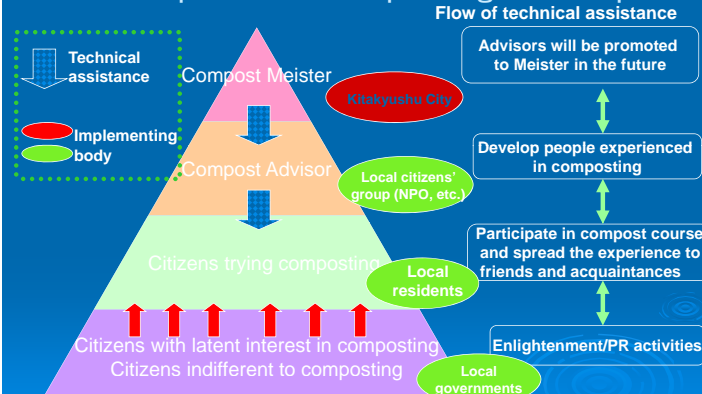
## Compost advisor training course

Number of advisors: 20

## Community Organic Waste Recycling Course

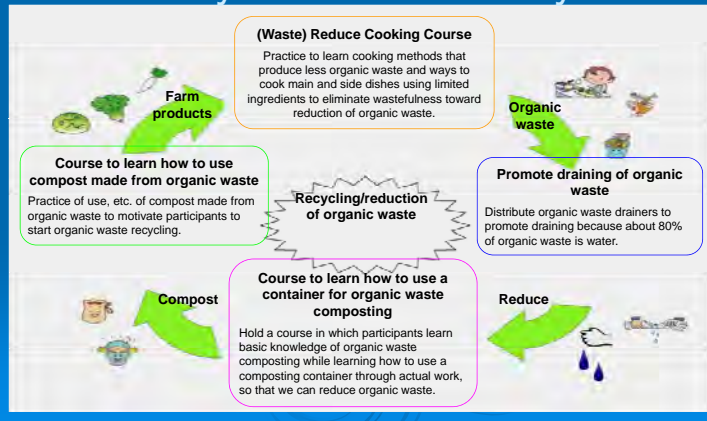
Number of participants  
FY2010: 108 in total  
(held at five locations)  
FY2011: 622 in total  
(held at 14 locations)

## Conceptual Diagram of Human Resource Development in Composting Technique





# Environmental Practice Toward Recycle-Based Society





## COMMUNITY SELF-BASED WASTE MANAGEMENT AND COMPOSTING IN SURABAYA

Gin gin Ginanjar



SURABAYA CITY GOVERNMENT



SURABAYA CITY

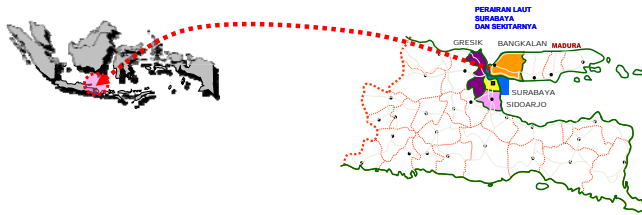
## OVERVIEW



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## ROLE AND POSITION OF SURABAYA



Surabaya city is located in East Java Island, Indonesia. Possessing the status as the 2nd biggest city in Indonesia, Surabaya has a strategic role as a gateway to East Indonesia and it has grown as a center for trade and industry services in Indonesia.

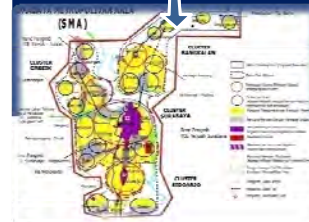
SURABAYA CITY GOVERNMENT



SURABAYA IN SCOPE OF  
EAST JAVA PROVINCE and RTRWP



SURABAYA IN SCOPE OF  
GERBANGKERTOSUSILA PLUS



SURABAYA IN SURABAYA  
METROPOLITAN AREA (SMA)

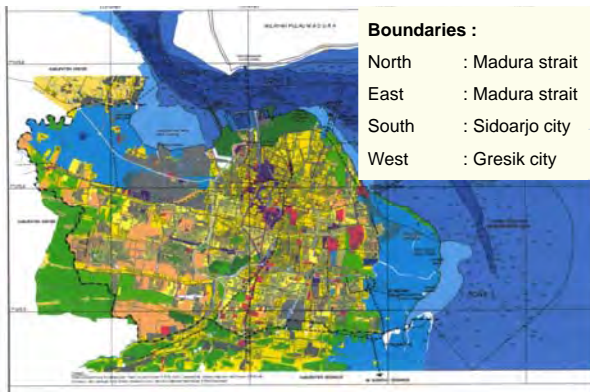
The vision of Surabaya Strategic Plan that is "**Surabaya Smart and Care**", which mainly focused on giving better future for its citizens.

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### Boundaries :

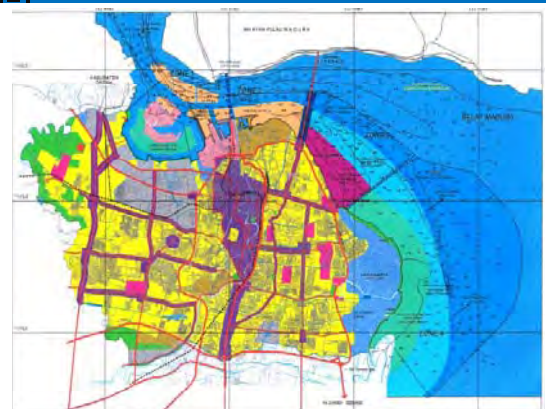
North : Madura strait  
East : Madura strait  
South : Sidoarjo city  
West : Gresik city



Surabaya area of land consisting of 330.48 km<sup>2</sup> and 190.39 km<sup>2</sup> marine area with a total area of approximately **520.87 km<sup>2</sup>**, divided into 31 districts and 163 Sub-District.



## SURABAYA CITY SPATIAL PLANNING DEVELOPMENT

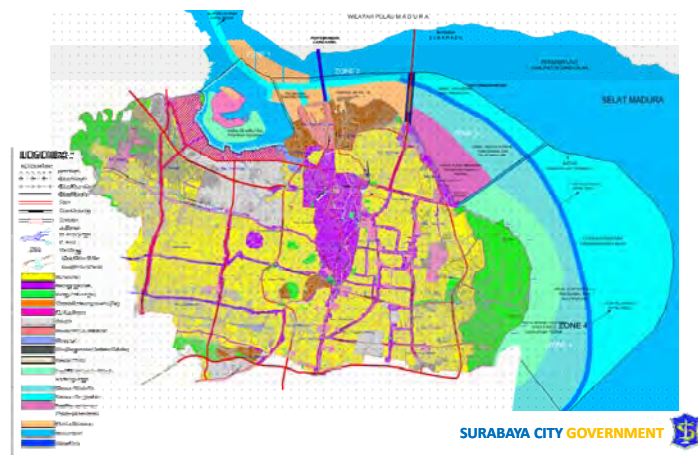


SURABAYA CITY GOVERNMENT

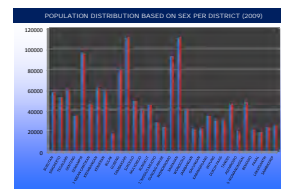
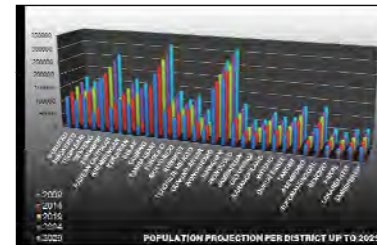
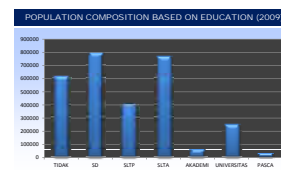




## SURABAYA CITY SPATIAL PATTERN PLAN 2009-2029



## POPULATION



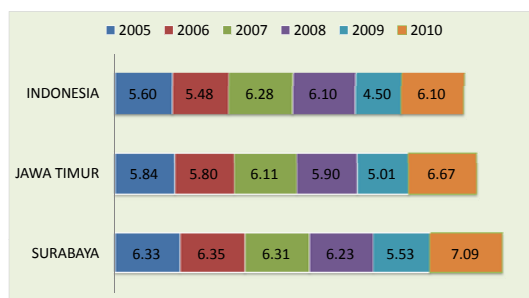
source: Review of RTRW Surabaya 2009 According to UU. 26 in 2007, processed

Total Population (End of 2010) : 3,055,005  
Population Growth Assumption : 1,89% ppl/year  
Urbanization : 2,66% (2008)  
**Population Projected in 2029**  
**3.974.275**

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## ECONOMIC GROWTH

### ECONOMIC GROWTH OF SURABAYA, EAST JAVA AND NATIONAL 2005-2009

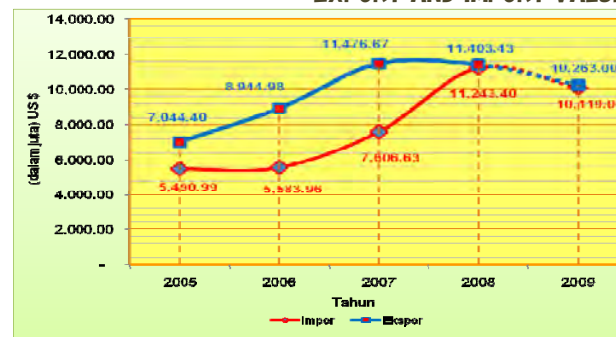


Source : BPS of Surabaya, East Java BPS, BPS, 2010, prepared

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## REGIONAL MACRO ECONOMIC FRAMEWORK

### EXPORT AND IMPORT VALUE

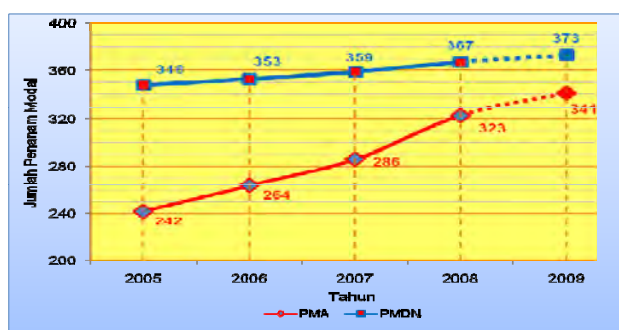


Source: Department of Trade, Industry, and Investment of Surabaya, 2008, prepared

**SURABAYA CITY GOVERNMENT**

## REGIONAL MACRO ECONOMIC FRAMEWORK

### INVESTMENT IN SURABAYA



Source: Department of Trade, Industry, and Investment of Surabaya, 2008, prepared

**SURABAYA CITY GOVERNMENT**

## SURABAYA CITY

# WASTE MANAGEMENT

**SURABAYA CITY GOVERNMENT**





## SURABAYA WASTE MANAGEMENT

- Structurally is Department of Cleanliness and Landscaping (DKP) responsibility
- Waste Characteristic



■ Organic ■ Anorganic

**ANORGANIC**  
 Plastic : 10,09 %  
 Metal : 1,41 %  
 Clothes : 2,68 %  
 Glass : 1,70 %  
 Woods : 2,39 %  
 Paper: 7,26 %  
 Roads : 0,46 %  
 Other: 1,48 %  
**Total : 27,59 %**

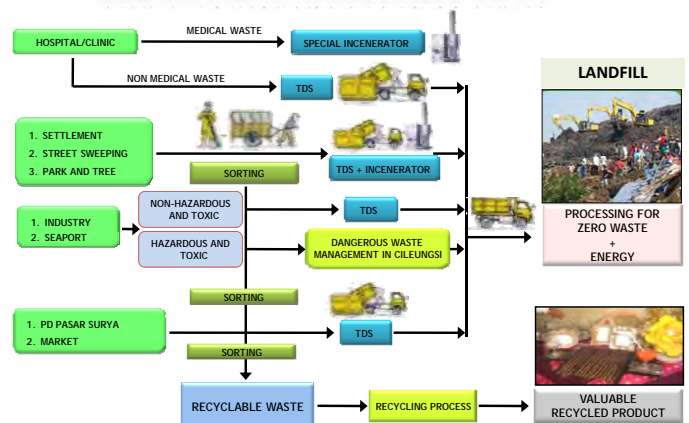
**ORGANIC**  
**Total : 72,41 %**



SURABAYA CITY GOVERNMENT

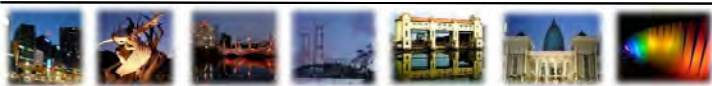


## WASTE COLLECTION AND TRANSPORTATION FLOW CHART



## FACILITIES AND INFRASTRUCTURE

No	Facilities and Infrastructure	Total (2011)
1	Landfill (TPA)	1
2	Sewage Treatment Plant (IPLT)	1
3	Temporary Disposal Site (TDS)	177
4	Composting Center	18
5	Waste Transporting Payloads	125



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## BENOWO LANDFILL

- Area = 34.7 Hectares
- System Controlled Landfill
- Equipped with WWTP processing (Chemical and Biological)
- Auction is being conducted for infrastructure investment



SURABAYA CITY GOVERNMENT



## BENOWO LANDFILL

### BENOWO LANDFILL Landuse (November 2008) :

1. Landfill	:	13,0786	Ha
2. Road and Drainage Facility	:	0,9945	Ha
3. Leachate Ponds	:	0,8015	Ha
4. WWTP	:	1,3714	Ha
5. Dumping Terminal	:	0,2686	Ha
6. Weigh Station	:	0,0069	Ha
7. Landfill levee	:	0,6982	Ha
8. Operational area (Warehouse, Workshop, Guardhouse and Clinic)	:	0,314	Ha
1. Not yet utilized	:	17,7432	Ha

### Waste Volume Dumped in Benowo Landfill until August 2010

Program	Objective	Indicators	Target	Realization
Management of City Cleanliness	Improving the quality of waste management and waste resources with enhancement of landfill capacity	Volume of waste piles at TDS	0.0 M3/day	115.38 M3/day
		Volume of waste dumped at Landfill	1,765.0 Ton/day	1,204.8 Ton/day

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## BENOWO LANDFILL

### Benowo Landfill Layout



NO	KETERANGAN	2005	2006	2007	2008
1	Landfill Facilities and Infrastructure Improvement Costs	8.391.870.553	8.828.644.107	13.877.590.710	12.033.111.552
2	Operational Management of Landfill Cost	1.299.911.653	4.993.624.084	5.229.546.335	9.871.879.307

Management Cost / ton = Total of average cost / year  
 Average waste volume / year  
 = Rp.16.131.544.575  
 540.200  
 = Rp. 29.862/ton

Source: Feasibility Study of Infrastructure Cooperation Benowo Landfill, 2008

### Land Needs Projection

TAHUN	WASTE VOLUME AFTER COMPACTION	TOTAL WASTE DUMPED / MONTH	AREA REQUIREMENT / YEARS (Ha)		
			Dump	Facility	Total
2008	399,71	11.991,43	24	7,2	31,20
2009	414,29	12.428,57	24	7,2	31,20
2010	428,86	12.865,71	24	7,2	31,20
2011	443,43	13.302,86	24	7,2	31,20
2012	458,00	13.740,00	24	7,2	31,20
2013	472,57	14.177,14	24	7,2	31,20
2014	487,14	14.614,29	24	7,2	31,20
2015	501,71	15.051,43	24	10,8	46,80
2016	516,29	15.488,57	36	10,8	46,80
2017	530,86	15.925,71	36	10,8	46,80
2018	545,43	16.362,86	36	10,8	46,80
2019	560,00	16.800,00	36	10,8	46,80
2020	574,57	17.237,14	36	10,8	46,80
2021	589,14	17.674,29	36	10,8	46,80
2022	603,71	18.111,43	36	10,8	46,80
2023	618,29	18.548,57	36	10,8	46,80
2024	632,86	18.985,71	36	10,8	46,80
2025	647,43	19.422,86	36	10,8	46,80

Source: Feasibility Study of Infrastructure Cooperation Benowo Landfill, 2008

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## SEWAGE TREATMENT PLANT (IPLT)



### IPLT

- Owned by Surabaya City Government
- IPLT Keputih is one of the Technical Service Unit (UPTD) in Department of Cleanliness and Landscaping which has responsible of managing fecal sludge into compost as an effort to improve the quality of the environment, especially water quality.



## SEWAGE TREATMENT PLANT (IPLT)



Build • 1989

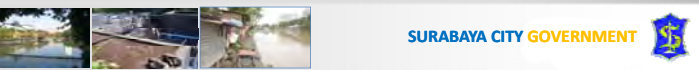
Operation • 1990

Management • Department of Cleanliness and Landscaping

Location • Keputih, Sukolilo District, East Surabaya

Capacity • 150 m<sup>3</sup>/day

Capacity Planning • 400 m<sup>3</sup>/day



## IMPEDIMENTS FACED PREVIOUSLY

- Lack of finances, accordingly can only afford open dumping system (piling up waste into final disposal site)
- Limited of civil society involvement
- Poor waste management (from collecting, transporting and managing the waste at final disposal site)
- Absence of adequate final disposal site due to the closure of KEPUTIH landfill

**Waste problem has been a main issue in Surabaya for years**

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## RESPONSES

Since **KEPUTIH LANDFILL** has been closed on October 2001, Final Disposal for Surabaya Waste Disposed to **BENOWO LANDFILL** with total area **34,7 Ha.**

However, the construction of **BENOWO LANDFILL** with capacity of 3000 m<sup>3</sup>/day has not been appropriate solution, given the amount of waste that time is 8000 m<sup>3</sup>/day

**WASTE VOLUME REDUCTION IS HARDLY NECESSARY**



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## CHANGES



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## RESPONSES

Facing these immense problems, the Government has undertaken several strategic efforts over the year to reduce the waste volume from its sources.

- **Building Community Self Based Waste Management**
- **Implementation of 3 R Program (Reuse, Reduce and Recycle)**

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## WASTE MANAGEMENT BY IMPLEMENTING 3R AND ACTIVELY INVOLVING COMMUNITY AND PRIVATE SECTOR

### TERM OF IMPLEMENTATION

Started in 2006 and Sustainable

### EXECUTIVE INSTITUTION

Department of Cleanliness and Landscaping

### DESCRIPTION

#### OBJECTIVE

- To extend the life of the Benowo landfill by applying waste management policy with 3R concept (Reduce, Reuse, Recycle) which involves the active role of public and private sectors as well as adding value to the garbage that had been only regarded as a residual / waste.

#### GOAL

1. Reduce the volume of waste dumped into Benowo landfill every day.
2. Encourage community to be able to perform independently on waste management in their household unit
3. Raise consciousness in community about economic value from the outcomes of organic and inorganic waste management, so it can provide additional income.
4. Create clean city environment and free from garbage

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## WASTE MANAGEMENT BY IMPLEMENTING 3R AND ACTIVELY INVOLVING COMMUNITY AND PRIVATE SECTOR

### INOVATION

1. Organizing events Surabaya Green and Clean (SGC) and Freedom From Garbage (MDS)
2. Waste Bank
3. Composting center

### INDICATOR OF SUCCESS

1. A decline in the volume of waste entering the landfill per day. This proves that the program for reduction waste from its source has successfully reduced the production of waste the city of Surabaya.
2. Increased number of program participants Surabaya Green and Clean (SGC) and Free From Garbage(MDS).
3. Increasing the number of regions that forming waste bank, so that inorganic waste dumped in landfill declined.
4. Increasing the number of households perform a independent activity for organic waste composting by setting up composting house, using Takakura baskets, and composting container.
5. Increasing the amount of compost from organic waste processing results used for greening activities.

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## COMMUNITY SELF-BASED WASTE MANAGEMENT

### BASIC CONCEPT

#### 1. Reducing waste from its source

- Decrease throwing waste careless.
- Reducing environment waste and reducing waste dumped into Final Disposal Site

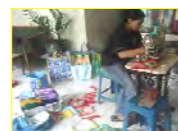
#### 1. Waste sorting; between organic and inorganic waste

#### 2. Waste Treatment:

- Organic → Compost
- Inorganic → Sell/ Process into material for recycled products
- Community compost house development

### TARGET

Entire city populaion



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## COMMUNITY SELF-BASED WASTE MANAGEMENT

### WASTE MANAGEMENT ACTOR

The actor actively endorsed the program, mainly not only supported by the city government but also with the involvement and synergetic efforts of various stakeholders, including from community, NGO, private sector, mass media, etc.

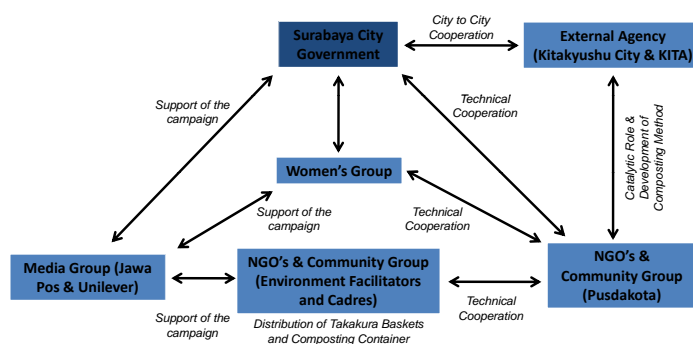
NETWORKING AND PARTNERSHIPS WILL PROVIDE OPPORTUNITY FOR EXCHANGE EXPERIENCE AND LEARNING BEST PRACTICES IN OTHER PLACES

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## COMMUNITY SELF-BASED WASTE MANAGEMENT

### RELATIONSHIP OF STAKEHOLDERS



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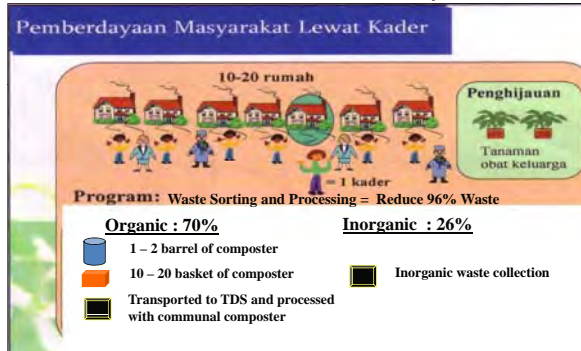




## COMMUNITY SELF-BASED WASTE MANAGEMENT

### ACTIVITIES INCLUDING:

1. Socialization
2. Environmental Cadre Assembly



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## COMMUNITY SELF-BASED WASTE MANAGEMENT

Changes in Surabaya is also due to persistence of Facilitators and Environmental Cadres. They invites and encourage residents to move to the environment. The result is a compact residents, encouraging achievements.

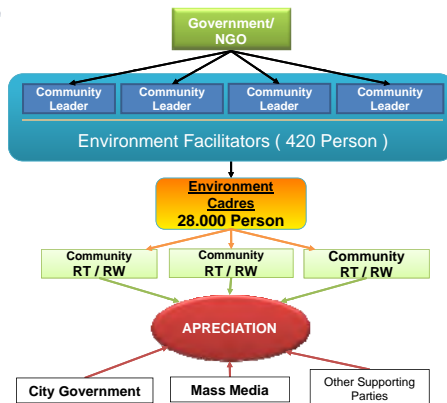


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## COMMUNITY SELF-BASED WASTE MANAGEMENT

### RECRUITMENT



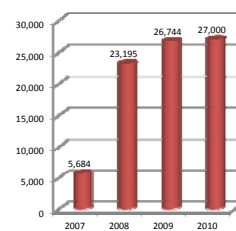
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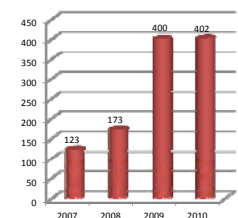
## COMMUNITY SELF-BASED WASTE MANAGEMENT

### CADRE GROWTH IN SURABAYA CITY

#### CADRE



#### FACILITATOR



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## COMMUNITY SELF-BASED WASTE MANAGEMENT

3. Helping the community
  - CLD in cooperation with NGO helps the community (Bangun Pertiwi, Sahabat Lingkungan, Puskakota, BLTKI, dll)
4. Distribution of Cleaning Tools
  - Distribution of composter
  - Takakura basket
  - Cart
  - Building compost house
5. Cleanliness Justice Operation



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## COMMUNITY SELF-BASED WASTE MANAGEMENT

### AREAS THAT HAS REDUCE THEIR WASTE

NO	AREAS	HOUSEHOLD NUMBER	WASTE VOLUME (M3/MONTH)	
			BEFORE	AFTER
1	Rungkut Lor RW IV	1.165	65	16
2	Mojo RW XII	1.156	262	139
3	Kebunsari RW II	638	63,16	21,76
4	Wonokromo RW V	523	46,32	0
5	Komplek Kenjeran RW I	260	90	0
6	Pakis RW III	1.056	202,8	147,33
7	Karah RW V	500	58	13,34
8	Margodadi RW VII	691	178	60,25
9	Jambangan RW II	510	68	26
10	Kedung Baruk RW V	350	14,4	4,32
11	Tenggiling Mejoyo RW IV	791	420	90
12	Ketintang RW III	720	618	210,4
13	Margorukun RW X	617	186,04	65,05

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## COMMUNITY SELF-BASED WASTE MANAGEMENT

### Location and Achievement

No	Location	Activities	Waste volume before process	Reduced waste volume	Result
1.	Mulyorejo, Gubeng, Sukolilo, Tambaksari, Tenggilis Mejoyo, Genteng, Krembangan, Wonokromo.	organic and inorganic waste moving, organic waste processed into compost, inorganic waste to be sold	22 – 40 m <sup>3</sup> per RT Per month	60 % inorganic waste sold, 30 % turned to compost, the rest 10 % dumped in TDS	Average income ± Rp. 1.500.000,00 / month
2.	Karah, Jambangan	□ Waste sorting □ Cleaning activities □ Tree planting □ Cleaning socialization □ Waste processing using household scale aerob composter bin	40,6 m <sup>3</sup> / day	□ 26,44 reduced by Depo Karah □ 1,3 m <sup>3</sup> / day reduced by cadre □ 0,88 m <sup>3</sup> / day scattered around □ 12 m <sup>3</sup> dumped in Benowo □ Dumped tin FDS 7 m <sup>3</sup> / hari	□ Compost 2 ton / month □ inorganic waste revenue Rp. 8.000.000,00 / month
3.	Jambangan, Jambangan	Waste processing using communal composter	250 kg  2,75 ton / day		Processed compost 25 kg / month, Gained compost 600 kg / month

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## COMMUNITY SELF-BASED WASTE MANAGEMENT

### Location and Achievement

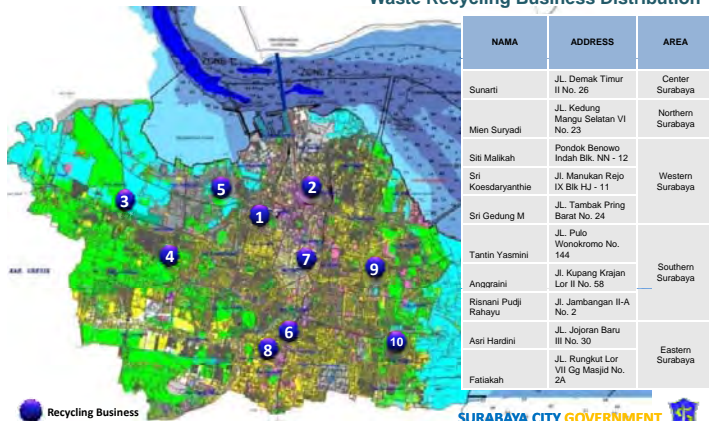
No	Location	Activities	Waste volume before treatment	Reduced waste volume	Result
4.	Kali Rungkut	□ organic and inorganic waste sorting, □ Waste processing training, □ Organizing waste management □ Waste management in household and community	1,1 ton/month	80 % waste reduced	□ Average waste dumped in Benowo reduced by 80% □ Less scattered waste
5.	Komplek Kenjeran	□ Organizing waste management □ Waste processing training, □ Household scale waste processing	1,2 ton/month	40 % waste reduced	100 people has sorted their waste
6.	Tenggilis Mejoyo ( RT. 01, RT. 02, RT. 5, RT. 06 )	□ 50% household has processed their waste using Takaura Basket □ Inorganic waste collected by scavenger and the rest is dumped in communal composter	250 kg  2,75 ton / day	50 % waste reduced	250-300 kg compost per 45 day with revenue of Rp. 250.000,-

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## COMMUNITY SELF-BASED WASTE MANAGEMENT

### Waste Recycling Business Distribution



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## COMMUNITY SELF-BASED WASTE MANAGEMENT

Many emerging villages seed in the field of recycling business. There were 10 ukm registered "recycling business" are scattered throughout the city of Surabaya.



Some are renting a booth in the modern markets:



Pasar Atom

CITO

DTC

Tunjungan Plaza

ITC Mega Grosir

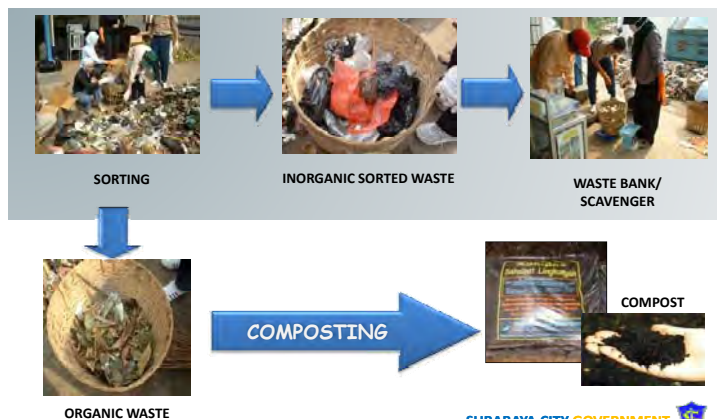
Jembatan Merah Plaza

Royal Plaza

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## COMPOSTING PROGRAM



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## COMPOSTING PROGRAM



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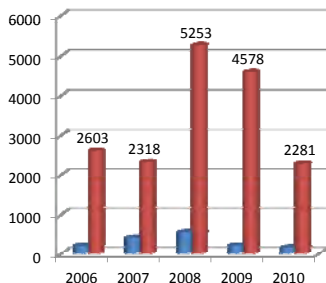




## COMPOSTING PROGRAM

### DISTRIBUTION OF TAKAKURA BASKET AND COMPOSTING CONTAINER (2009) :

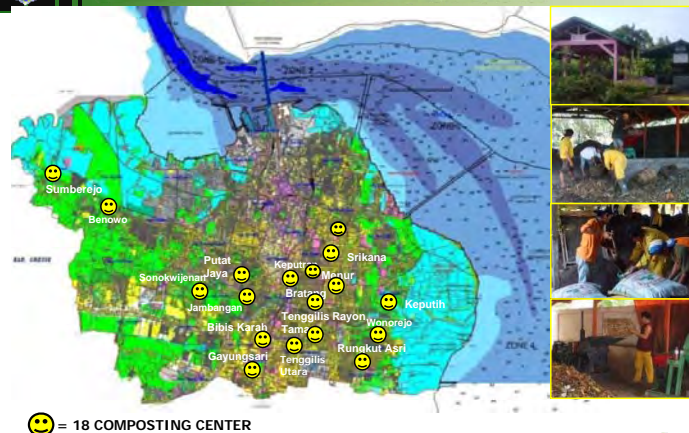
- Takakura Basket reached 13.669 unit
- Composter bin reached 795 unit



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## GOVERNMENT COMPOSTING CENTER



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## GOVERNMENT COMPOSTING CENTER

- |                                       |                             |
|---------------------------------------|-----------------------------|
| 1. Composting Center Sumberrejo       | : Pakal District            |
| 2. Composting Center Gayungan sari    | : Gayungan District         |
| 3. Composting Center Bratang          | : Gubeng District           |
| 4. Composting Center Srikana          | : Gubeng District           |
| 5. Composting Center Jambangan        | : Jambangan District        |
| 6. Composting Center Bibis Karah      | : Jambangan District        |
| 7. Composting Center Rungkut Asri     | : Rungkut District          |
| 8. Composting Center Wonorejo         | : Rungkut District          |
| 9. Composting Center Putat Jaya       | : Sawahan District          |
| 10. Composting Center Menur           | : Sukolilo District         |
| 11. Composting Center Sonokwijenan    | : Sukomanunggal District    |
| 12. Composting Center Keputran        | : Tegalsari District        |
| 13. Composting Center Tenggilis       | : Tenggilis Mejoyo District |
| 14. Composting Center Tenggilis Utara | : Tenggilis Mejoyo District |
| 15. Composting Center Benowo          | : Pakal District            |
| 16. Composting Center LIPONSOS        | : Sukolilo District         |
| 17. Composting Center UPN Veteran     | : Gunung Anyar District     |
| 18. Composting Center PUSDAKOTA       | : Rungkut District          |



SURABAYA CITY GOVERNMENT



## COMMUNAL COMPOSTING CENTER



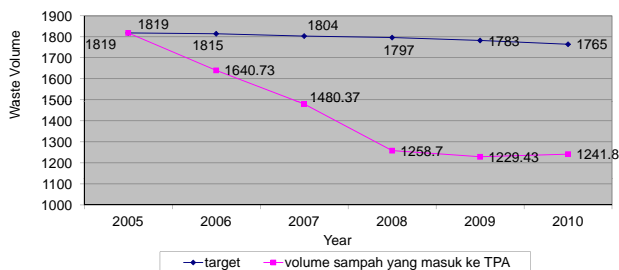
- |  |   |
|--|---|
| 1. RW X Sub-District Gundih<br>- Average yield $\pm 2-3$ M3/Day.<br>- Area 3 m x 12 m.                         | 6. Srikana, Jl Srikana<br>Sub-District Airlangga<br>-Average yield $\pm 3$ M3/Day.<br>-Area 9 m x 12 m        |
| 2. Kedung Baruk V<br>Sub-District Kedung Baruk<br>-Average yield $\pm 1-1,5$ M3/2 Day.<br>-Area 5,5 m x 18 m.  | 7. Surabayan IV RT 04 RW II<br>Sub-District Kedungdoro<br>-Average yield $\pm 3$ M3/Week<br>-Area 3 m x 3 m.  |
| 3. Panjang Jiwo V,<br>Sub-District Panjang Jiwo<br>-Average yield $\pm 0,5 - 1$ M3/2 Day.<br>-Area 3 m x 20 m. | 8. Tenggilis Mejoyo Utara<br>Sub-District Tenggilis<br>-Average yield $\pm 3$ M3/Day.<br>-Area 15 m x 15 m.21 |
| 4. Putat Jaya<br>Sub-District Putat jaya<br>-Average yield $\pm 10$ M3/Day.<br>-Area 15 m x 40 m.              |   |
| 5. Sono Kwejinan<br>Sub-District Sono Kwejinan<br>-Average yield $\pm 12$ M3/Day.<br>-Area 25 m x 45 m         |   |

SURABAYA CITY GOVERNMENT



## RESULT OF 3R IMPLEMENTATION IN WASTE MANAGEMENT PROGRAM

### Waste Volume Dumped in Benowo Landfill 2005 -2012



A decline in Waste Volume Dumped in Landfill per day, proves that the **Program of Reduction Waste From its Sources** has successfully reduced the production of waste the city of Surabaya

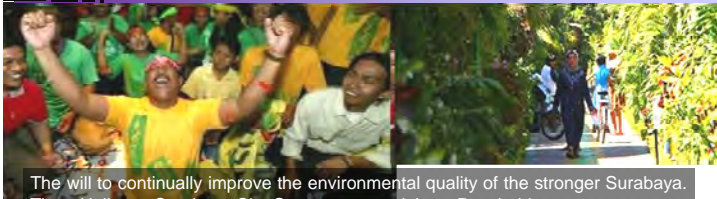


SURABAYA CITY GOVERNMENT





## SURABAYA GREEN AND CLEAN



The will to continually improve the environmental quality of the stronger Surabaya. Thus, Unilever, Surabaya City Government and Jawa Post held

### SURABAYA GREEN AND CLEAN

Surabaya Green and Clean Program merupakan *is a socialization strtrgic, education and apreciation to the community in order to improving quality of environment.*

The program was launched in **2005**, Surabaya Green and Clean it was initiated with dissemination of hygiene and cleanliness competition for all RT in Surabaya

SURABAYA CITY GOVERNMENT



## SURABAYA GREEN AND CLEAN

### Appreciation to the Community



**Surabaya Green and Clean (SGC) 2005**  
it was initiated with dissemination of hygiene and cleanliness competition for all RT in Surabaya

**SGC 2006** it was initiated emerging of environmental cadres. **Waste sorting is start became a strong parameter** in a progress analysis for each region.



SURABAYA CITY GOVERNMENT



## SURABAYA GREEN AND CLEAN

### Appreciation to the Community



**SGC 2007**, cleanliness and waste management became **priority program in community**. All elements of the city continue to work together to implement environmental program.

**SGC 2008** it was instead of emerging various inovation in waste management. **Environmental program, waste treatment sistem and other citizen creativity in environment, cultural and social.**



SURABAYA CITY GOVERNMENT



## SURABAYA GREEN AND CLEAN

### Appreciation to the Community

**SGC 2009**, the theme taken was **"Surabaya berbunga"**. Is a **union between Community self – Based and Greening Program.**



**SGC 2010** does not just want to make Surabaya Clean but the target would also like to make Surabaya more Flowers and Colorfull.



SURABAYA CITY GOVERNMENT



## SURABAYA GREEN AND CLEAN

### Appreciation to the Community

**SGC 2011**, the theme taken was **"Surabaya Berbunga Berlangit Biru "** is a union of **Community self-Based Program, Greening, and Inovation of Waste Management.**

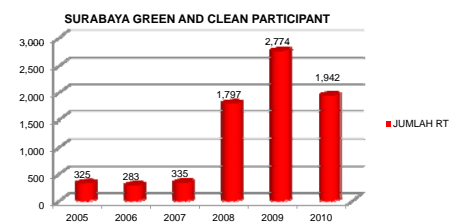


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## SURABAYA GREEN AND CLEAN

- Community based waste management has been conducted in 31 Dist. And 163 Sub-Dist.
- Award from government is given to community such as **Green and Clean (2005 – 2011)**, and **Free from Waste (2006)**



SURABAYA CITY GOVERNMENT







## WASTE BANK

### Process of Saving



Customer deposit waste that already sorted



Sorted waste is weighed by Bank teller and will convert to currency by its value



Proceeds from sales are included in savings book



Customers can find updates and retrieve their savings at any time.

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## WASTE BANK

### Number of Customer and Omzet of Waste Bank

Bank Name	Costumer	Omzet
1. Bank Sampah Bina Mandiri	± 600	± 30.000.000,00 / Month
2. Bank Sampah Rukun Karya	± 168	± 2.000.000,00 / Month
3. Kelurahan Jeruk, Kecamatan Lakarsantri	± 151	± 1.018.000,00 / 2 Month
4. Kelurahan Gading, Kecamatan Tambaksari	± 120	± 1.812.500,00 / 2 Month
5. Kelurahan Bulak Banteng, Kecamatan Kenjeran	± 45	± 1.049.000,00 / 2 Month

### There are 50 Active Waste Bank

RW II Kel. Dukuh Setro



SURABAYA CITY GOVERNMENT



RW X Kel. Gundih



## ENVIRONMENT EDUCATION



### ADIWIYATA SCHOOL 2011

#### Elementary School Nominee:

1. SDN Tandes Lor I
2. SDN Sambikerep I
3. SDN Made II
4. SDN Pagesangan
5. SD Darul Ulum
6. SDN Kebonsari I
7. SDN Sambikerep V
8. SDN Made I
9. SDN Lidah Kulon I
10. SDN Kaliasin

#### Junior High School Nominee:

1. SMPN 4
2. SMPN 38
3. SMPN 1
4. SMPN 37
5. SMPN 14
6. SMPN 28
7. SMPN 2

#### High School Nominee:

1. SMK Mater Amabilis
2. SMAN 5

SURABAYA CITY GOVERNMENT



## ENVIRONMENT EDUCATION

### ENVIRONMENTALLY CULTURED (ADIWIYATA) SCHOOL IN SURABAYA 2011

#### ✓ National Adiwiyata School:

1. SDK Santa Theresia

#### ✓ National Autonomous Adiwiyata School :

1. SDN Kandangan III

#### ✓ National Adiwiyata School :

1. SDN Petemon XIII
2. SDN Kandangan I
3. SD Santa Maria

SURABAYA CITY GOVERNMENT



### Adiwiyata School Santa Theresia



### Adiwiyata School SDN Kandangan III





## CONSELING ACTIVITY



Student Counseling

Businessman Counseling

Community Counseling

Apparatus Counseling

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## ENVIRONMENTAL CAMPAIGN

Carbon Footprint Conference



Ozone Campaign



Riverside Village



SURABAYA CITY GOVERNMENT



## SURABAYA ACHIEVEMENT IN ENVIRONMENT

1. ASEAN Environment Sustainable City Award 2011
2. Asian cities of the future 2009/2010
3. "Dubai International Award For Best Practices to Improves The Living Environment 2008" for Green and Cleas Initiative Indonesia
4. "The Green Apple Award 2007" for Environmental Best Practice
5. Energy globe 2005
6. Adipura 1988-1998 dan 2005-2011
7. Adiwiyata
8. Wahana Tata Nugraha
9. Green Building di Kota Surabaya: ASEAN Center for Energy Award (2002: Graha Pangeran, 2006: Graha Wonokoyo)

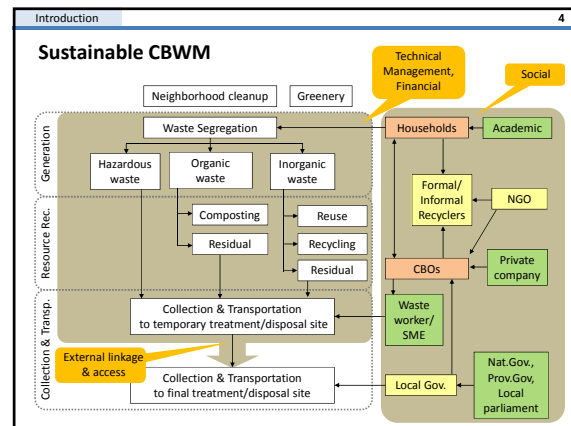


THANK YOU



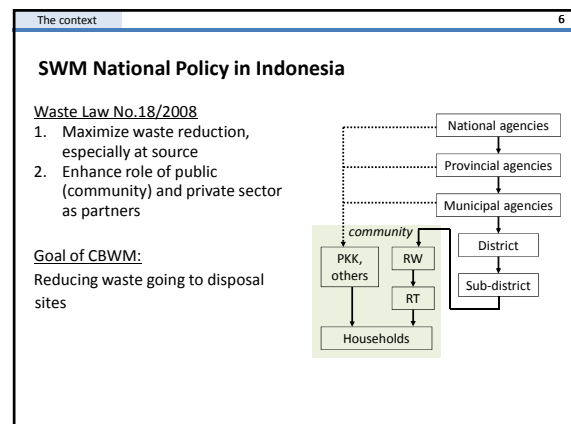
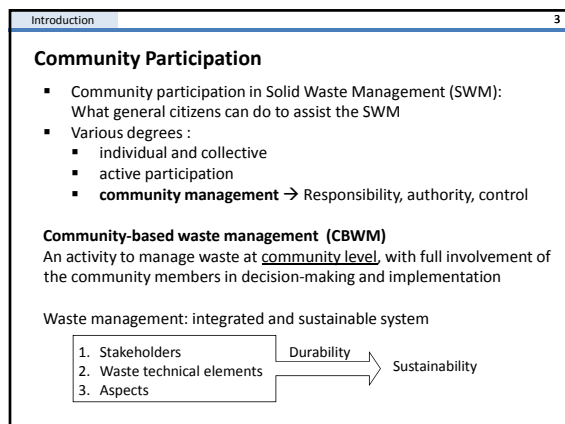
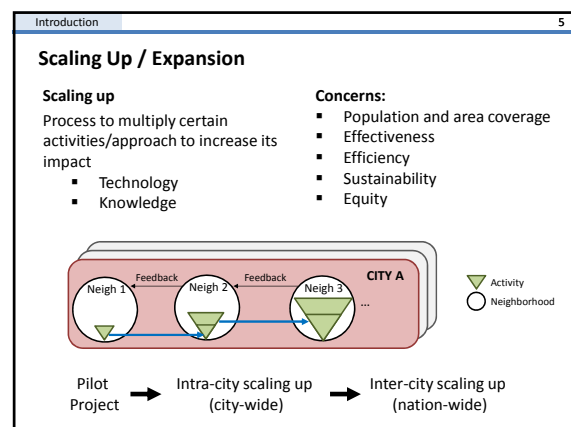
## Expanding the implementation of community-based solid waste management: Key Factors and Challenges in the Green and Clean Program in Indonesia

Akino M. Tahir  
Mitsuo Yoshida

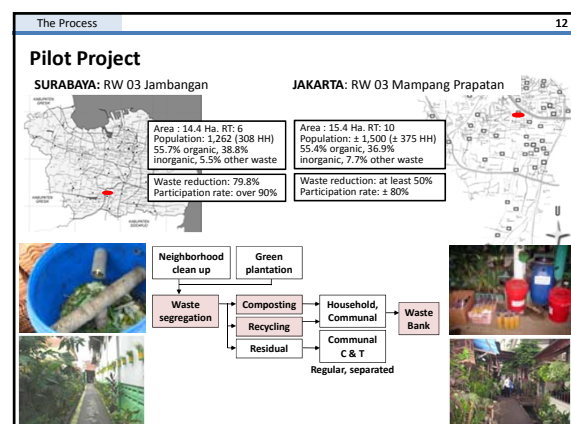
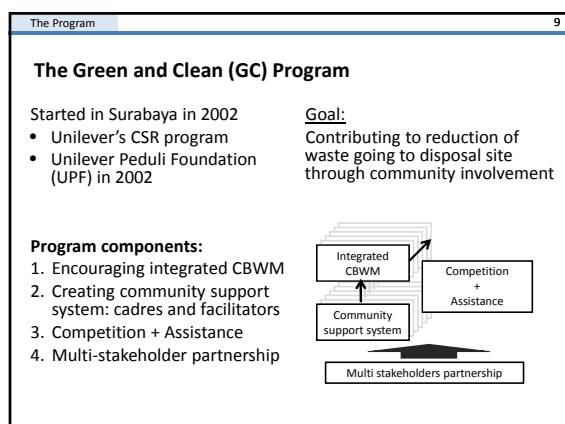
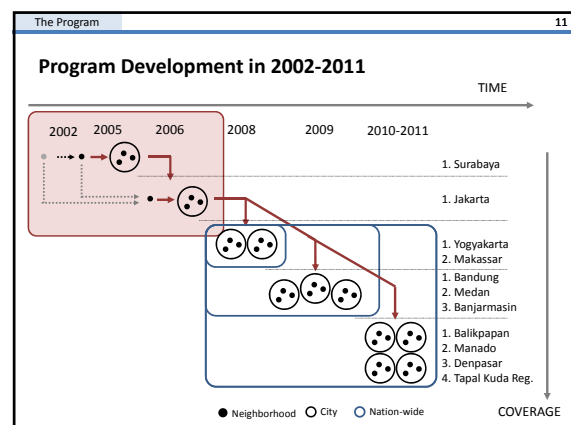
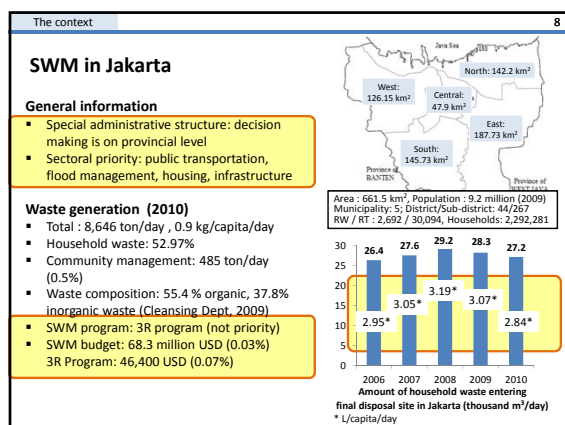
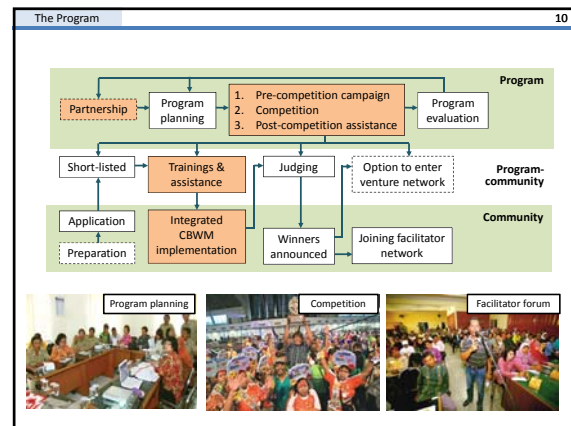
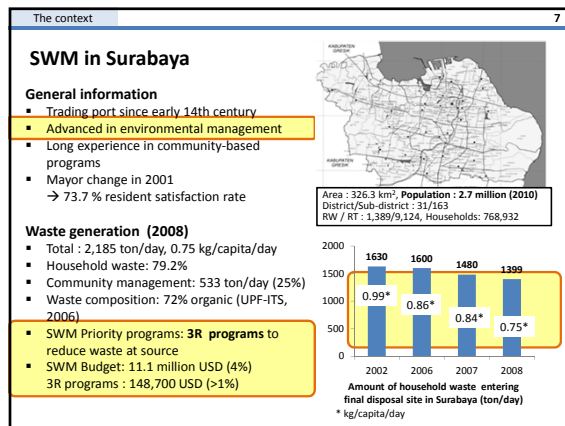


## Contents

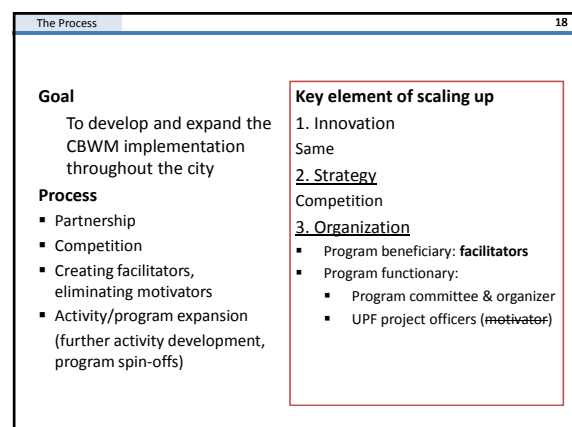
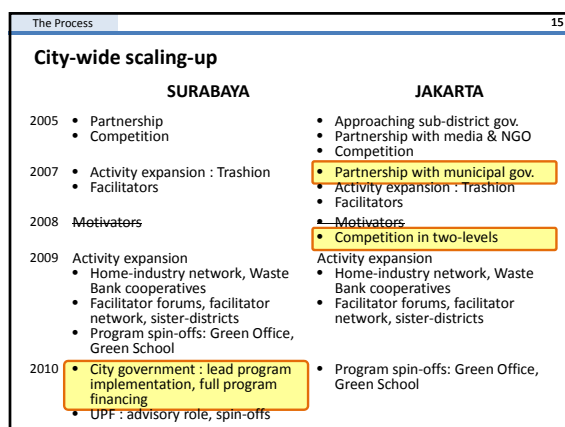
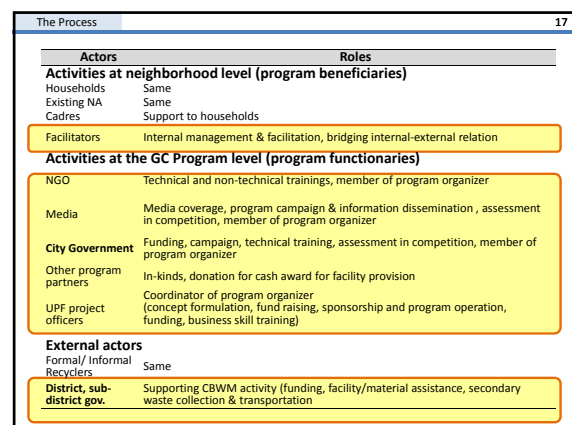
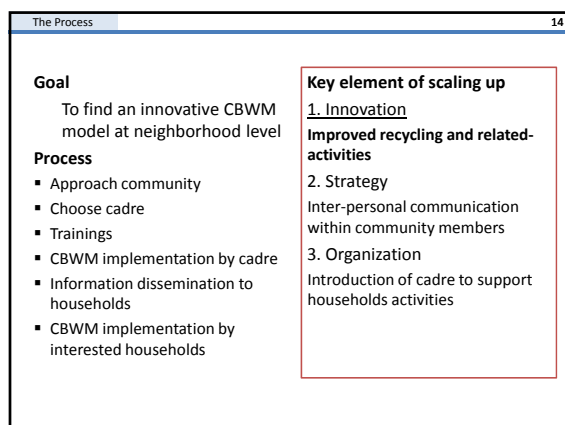
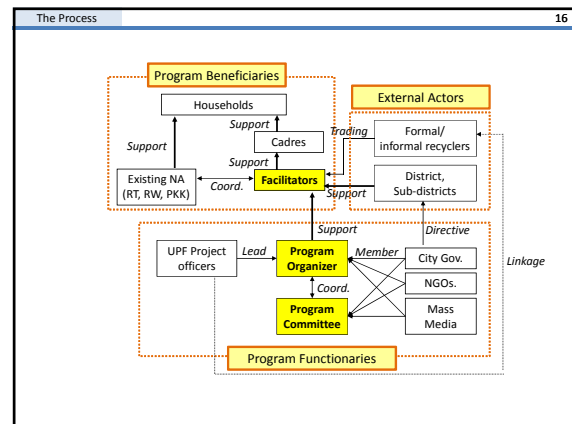
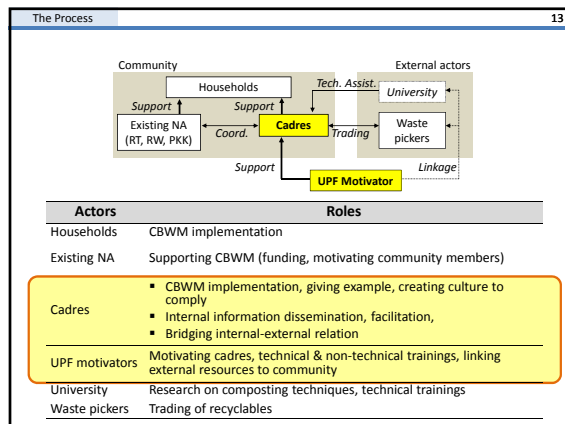
1. Introduction
2. Setting the context
3. The Green and Clean Program
4. Scaling up process & outcome
5. Relevant success factors
6. Closing remarks











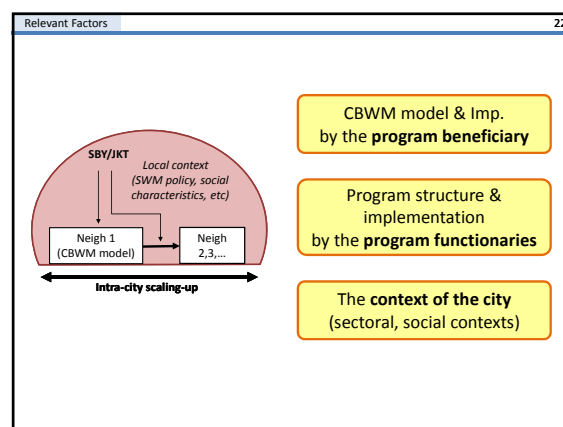


**The Process** 19

**Pilot Stage**  
Development of an innovative model is necessary before a consideration of scaling-up is put forwarded. The model should accommodate the technical elements of CBWM and a system to support community activities

**City-wide Stage (Intra-city scaling up)**  
Strategy for scaling-up is necessary, along with organizational adjustment within the program beneficiary and functionaries

(Addition)  
**Nation-wide stage (Intra-city scaling up)**  
Dissemination of success story in the available forums that connect cities



**The Outcome** 20

**Neighborhood level: CBWM impact**

SURABAYA	JAKARTA
Waste reduction: 79.8%	Waste reduction: at least 50%
Participation rate: over 90%	Participation rate: ± 80%

**Improvement :**

- Management structure
- Role sharing
- Financial scheme (improvement of recycling & others)
- Strengthening relation to informal sector

**Difficulties :**

- Limited linkage to other actors,
- Distant location → Communication and interaction

**Relevant Factors** 23

- Design :** of the CBWM model & the scaling-up program
  - Utilization of appropriate technology (composting, recycling scheme)
  - Adaptable and responsive model
  - Targeted strategies & participatory approach
- Institutional aspect:**
  - Establishment of support system at neighborhood level
  - Attention to the larger institutional needs : expansion of the organizational structure, capacity building, resource allocation
  - Linkage between actors (community-program partners-other actors)
- Information dissemination:**
  - Effective communication pathway within / between program beneficiary and functionaries
  - Information sharing + knowledge transfer
- Policy aspect:**
  - Supportive policy climate at local level: basic policy, regulation, budget
- Social participation aspect:**
  - Community capacity to demand and participate
  - Vibrant community sector and the experience of public sector in community-based programs

**The Outcome** 21

**City level**

SURABAYA	JAKARTA
<b>Area coverage</b> 163 sub-districts (100%) 30% of total 9,124 RT	<b>Area coverage</b> 164 sub-districts (61%) 18.3 % of total 2,692 RW 10% of total 30,094 RT
<b>Assistance coverage:</b> Facilitators : 420 Cadres : 28,744 Household : 37.4 % of total 768,932	<b>Assistance coverage:</b> Facilitators : 492 Cadres : 50,045 Household : 21.8 % of total 2.2 million

- Increased number of CBWM
- Government attention and involvement in CBWM

**National level**

- Coverage of 10 cities (out of 24 big cities in the country) + 1 region
- Unilever: increased CSR commitment, enhanced public image

**Closing Remarks** 24

CBWM scaling up: consecutive stages (pilot, intra-city, inter-city)

**Important lesson** in intra-city scaling up in the GC Program:

- An appropriate CBWM design → universal, but flexible
- A structured program design to support community activity
- Information dissemination, communication channels and forums
- Local context : policy, timing, social characteristics, etc
  - Outcome may be different → knowledge gap
- Universal principles

Requires **interaction and close cooperation** between all stakeholders  
Government (city, district, sub-district) + Private Sector  
+ NGO + Community + Others

For scaling up, role of government is necessary in:

- Performing stewardship
- Creating enabling environment
- Providing resource



## Basic Theory of Compost (Takakura Compost)

Jpec Co., Ltd.  
Wakamatsu Environment Research Institute

1

## Key Elements of Composting

- Fermentative microorganism
- Water content adjustment
- Aerobic fermentation (using oxygen)

2

## Various Microorganisms involved in composting

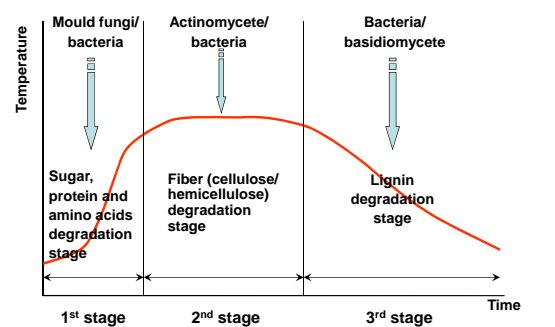
- One kind of microbe alone cannot complete composting.
- Priority type changes according to the stage of composting.
- Bacteria, mould fungi, actinomycetes and basidiomycetes are necessary.
- It is better to use as many types as possible within the same category of bacteria (fungi) to ensure diversity.



Don't expect that bacteria/fungi will proliferate on their own; rather, prepare them with purpose.

3

## Composting and transition of microorganisms (These processes proceed concurrently in a composting container)



Source: How to Make and Use Compost, FUJIWARA Shunroku, Rural Culture Association Japan

4

## 1st Stage of Composting (Fermentation)

◎ It is important to swiftly decompose easily decomposable organic matters using useful microorganisms.

Metabolic utilization of a wide variety of microorganisms is possible for easily decomposable organic matter.

For example, fungi and *E. coli* that cause food poisoning and allergies may proliferate through metabolic utilization depending on the condition.



Strategy

Add fermented foods such as yeast and lactic acid bacteria to massively propagate safe mould fungi and bacteria.

→which also preserve the compost from decay





## Second Stage of Composting (Fermentation)

☉ Most organic matters of vegetable origin are fibrous

cellulose, hemicellulose, lignin



Add actinomycetes (living in leaf soil) suitable for the breakdown of cellulose and hemicellulose.

You can make leaf soil yourself though it takes time.

7



Collect at as many places as possible.

## Third Stage of Composting (Fermentation)

☉ Lignin takes the longest time to break down in organic matters such as vegetable.



Add basidiomycetes (mushrooms) suitable for the breakdown of lignin.

9



Gather a wide variety of mushrooms

## Gather Fermentative Microorganisms in Local Area

- Microorganisms involved in fermentation of foods are effective.
- If fermented foods are not available, **half-broken-down leaves (leaf soil)** are effective.
  - Furthermore, you can gather bacteria and spores of mould fungi, actinomycetes and basidiomycetes at the same time.
- Microorganisms useful for composting are attached to the surfaces of fruits and vegetables.
  - Gather them using saltwater applying the method of *asazuke* (vegetables lightly preserved in salt). While salt suppresses the proliferation of germs that cause decay, gather your intended **lactic acid bacteria and yeast fungi**.

11



Fresh

Vegetable skin

Leafy vegetable

Fruit skin





## Effects Expected from Fermentative Microorganisms

Locally gathered microorganisms are not only effective for composting, but also:

- They **interact well** with the local soil.
- Microorganisms in fermented foods produce **hormonal-like substances** and **vitamins** that may facilitate plant growth.
- Certain kinds of actinomycetes produce **antibiotics**, which may create a disease-resistant soil environment.

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## Cultivation of Fermentative microorganism-1 (sugar water)

**Fermented foods + Sugar water**

**Ingredient A:**  
★ Brown sugar: about 50 grams  
★ Tap water: about 15 liters

**Ingredient B:**  
★ Fermented food: Yogurt, miso paste, natto, etc.

**Process:**  
1. Mix  
2. Mix  
3. Shake well after sealing the opening with a plastic bag.

Container (about 20 liters)

14

## Cultivation of Fermentative microorganism-2 (saltwater)

**Vegetable/fruits + Salt water**

**Ingredient A:**  
★ Salt: about 15 grams  
★ Tap water: about 4 liters

**Ingredient B:**  
★ Leafy vegetables, vegetable/fruit skins: Eggplant, cucumber, Chinese cabbage, lettuce, grape, papaya, pumpkin, etc.

**Process:**  
1. Mix  
2. Mix  
3. Shake well  
4. **NOTE:** Always use fruit skins to facilitate fermentation.

Container (about 20 liters)

15

## Cultivation of Fermentative Microorganism-3

**Fermentation in liquid**

If leaf soil is available  
↓  
Mix water and leaf soil  
↓  
Mix with base material

**Base material (provides nutrition and medium)**  
Rice bran : rice husk = 1:1~5  
Rice bran : rice husk : wood waste = 1:1:1  
Rice bran : fallen leaves = 1:1~5

16

## Optimal Water Level for Composting

Appropriate water content is **40~60%**.

- Too little water slows the activities of fermentative microorganisms.
- Too much water reduces the amount of oxygen.  
→ Creates an anaerobic condition leading to decay



To reduce the risk of failure, maintain the moisture level of the fermentation bed in the compost container lower at 40-50%.

To speed up breakdown at a compost center, maintain the moisture level higher at 50-60%.

17

## How to adjust water content

**POINT**

Mix fermentation liquid and water and adjust the water content of the mixture in the range of 40 to 60% (If you take a handful of the mixture and squeeze it, it forms a ball but you do not actually have water running out between your fingers)

**Failure (too much water)** **Failure (too little water)** **Success**

18





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