A Follow-up Seminar of KitaQ System Composting in Asia

Overview

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

Participants (15 cities from 5 countries)

<table>
<thead>
<tr>
<th>Country</th>
<th>Member Cities</th>
<th>New Cities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indonesia</td>
<td>Balikpapan, Palembang, Tarakan, Makassar* (Central Jakarta)</td>
<td>Mataram*, Chianjir*</td>
</tr>
<tr>
<td>Philippines</td>
<td>Cebu (Bago, Puerto Princesa, Talsay (Negros), San Fernando (La Union))</td>
<td>Mandaue, Sagay*</td>
</tr>
<tr>
<td>Malaysia</td>
<td>Sibu (JICA Grassroots Project), Kampar* (Kuching North)</td>
<td>Hang Tuah Jaya (JICA Grassroots Project)</td>
</tr>
<tr>
<td>Thailand</td>
<td>Bangkok (BMA), Nonthaburi, Sri Lacha, Sankanpaen</td>
<td></td>
</tr>
<tr>
<td>Sri Lanka</td>
<td></td>
<td>Badulla*, Kuliyapitiya*</td>
</tr>
<tr>
<td>Peru</td>
<td>Lima (JICA Solid Waste Management Project)</td>
<td></td>
</tr>
</tbody>
</table>

* Counterparts of Japan Overseas Cooperation Volunteers (JOCV)

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

Activities & Expected Outputs

Main Activities of the Workshop

- Progress reporting by the member cities
- Target setting by the new member cities
- Site visits
  - JPec Co. (Takakura Method) & Yoshihara Organic Farm
  - Merry Co. (Mechanical Composting) & vegetable farm
  - Waste sorting facility (bottles, cans, papers, plastics)

Expected Outputs

- Interactive discussion
  - Learning from each other’s experiences
  - Learning from the solid waste management policies and practices in Kitakyushu City
  - Learning composting business models, success factors, necessary regulations and incentives, ways to involve stakeholders
- Developing an Action Plan
- Monitoring & Evaluation

Strategy to Reduce 10-20% Waste in 3 years

Project Management in Each Step

<table>
<thead>
<tr>
<th>&lt;Inputs&gt;</th>
<th>&lt;Processing&gt;</th>
<th>&lt;Outputs&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food industries</td>
<td>Composting Centre</td>
<td>Compost Basket</td>
</tr>
<tr>
<td>Vegetable markets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restaurants</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retail stores</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Households</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waste Bank</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recyclables</td>
<td>Paper, metal, glass, cloth, PET bottle, plastics e-waste</td>
<td></td>
</tr>
</tbody>
</table>

<Inputs> | <Processing> | <Outputs>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Landfill</td>
<td>Composting Centre</td>
<td>Running cost</td>
</tr>
<tr>
<td>Vegetable markets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green waste</td>
<td>Collection &amp; transportation</td>
<td></td>
</tr>
<tr>
<td>(leaves, tree branches)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Households</td>
<td>Waste Bank</td>
<td></td>
</tr>
<tr>
<td>Recyclables</td>
<td>Monitoring by community leaders</td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td>Selling plants and vegetables</td>
<td></td>
</tr>
</tbody>
</table>

Surabaya’s Model

The whole system is managed by the city government

- Capital investment by the city (15 sites)
- Replacing the use of chemical fertiliser (Cost saving for the city)
Ref) Food waste management cost in Malaysia

<table>
<thead>
<tr>
<th>Food waste separation</th>
<th>Collection &amp; transportation</th>
<th>Treatment</th>
<th>Marketing the products</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>• Anaerobic digestion</td>
<td>• Electricity, biogas</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Waste-to-energy</td>
<td>• Heat</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Carbonisation</td>
<td>• Carbon, fuel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Composting</td>
<td>• Compost</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Collection &amp; transportation</th>
<th>Running cost</th>
<th>Capital cost (10-year period)</th>
<th>Income from electricity generation</th>
</tr>
</thead>
<tbody>
<tr>
<td>24-30 USD/t</td>
<td>24-30 USD/t</td>
<td>24-30 USD/t</td>
<td>18-27 USD/t</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Landfill disposal option</th>
<th>Collection &amp; transportation</th>
<th>Landfill ( tipping fee )</th>
<th>Capital costs (aftercare cost)</th>
<th>Income from electricity generation</th>
</tr>
</thead>
<tbody>
<tr>
<td>24-30 USD/t</td>
<td></td>
<td>15 USD/t</td>
<td>15-30 USD/t</td>
<td></td>
</tr>
</tbody>
</table>

| 45-75 USD/t             | Need additional cost to promote waste treatment! | Cheap landfill option is the bottleneck! |

Gianyar’s Model (Indonesia)
Project Management by an NGO (private company)

<Inputs>
- Municipal waste
- On-site waste sorting by local staff

<Purchasing>

<Processing>
- Composting Centre
- Running cost
- Capital cost
- Selling compost
- Farmers
- Income

<Outputs>
- Selling CERs
- Buyers of CERs
- Income

Recyclables
- Paper, metal, glass, cloth, PET bottle, plastics e-waste

Strategy to Reduce 10-20% Waste in 3 years
How do you promote composting and waste reduction?

<Inputs>
- Impose tipping fees; Raise final disposal fees

<Processing>
- Food industries
- Vegetable markets
- Restaurants
- Retail stores
- Separate organic waste collection
- Composting Centre
- Supply of compost
- Quality assurance
- Compost Basket
- Free distribution?
- Organise community groups and NGOs for monitoring and trouble shooting

<Outputs>
- Replace the use of chemical fertiliser
- City parks
- Greenery
- Farmers
- Gardens

The project cost should be funded by the saving of solid waste management cost

Waste Reduction and Recycling in Yokohama City – 1

<Inputs>
- Yokohama City collects garbage and recyclables, separating according to the categories.

<Processing>
- Burnable Garbage
- Unburnable Garbage
- Compostable materials
- Recyclable materials
- Others

<Outputs>
- Model recycling projects in 57 elementary schools
- Public Awareness campaign (11,000 seminars covering 80% population, 470 campaigns at railway stations, 2,200 campaigns at waste collection stations)

Waste Revolution in Nagoya City – 1

<Inputs>
- Introduce a new waste separation and collection system

<Processing>
- More than 2,300 public meetings and seminars were held throughout the city for introducing the new waste management system to its citizen

<Outputs>
- Community-based organizations played a key role in organizing waste sorting centers
- Promoted eco-coupon campaign with shops

Source: Yokohama City

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

Established a strong partnership among key stakeholders

Achieved 42% waste reduction in 2009

Source: Yokohama 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.

Established a social system for promoting environmentally friendly lifestyles.

An area selected for new landfill site turned into internationally recognized wetland in Japan.

Photo: Aichi, Nagoya

Solid Waste Management in Kitakyushu City - 1

3,000 community awareness meetings to introduce the new waste management system.

Source: Kitakyushu City

Solid Waste Management in Kitakyushu City - 2

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

Enforcement of pricing bags (1998)

Saved waste management cost by 10%.

Raising the bag price (2006)

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

Data on Dec. 2009

1RM=25JPY

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

Ref. Waste reduction measures for household waste in Japan

Promoting composting at each household.

Compost basket of PPSPPA

EM bokashi bucket of North Kuching

Photo taken by Mekaru

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.

Photo: Kictham, 2011
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 (Chikushi Montanai 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)
- Started to collect kitchen waste separately

Creating a Recycling-based Society in Oki Town - 2
Achieved total waste to be incinerated by 44% within 6 years

- New market for local farmers
- Generated renewable energy, biomass
- Established a new social system and lifestyles

Summary Sheet of Follow-up Actions

<table>
<thead>
<tr>
<th>Name of the City</th>
<th>Balikpapan, Indonesia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal for waste reduction</td>
<td>10% waste reduction by 2015 (based on 2011)</td>
</tr>
</tbody>
</table>
| Long-term strategies   | - Establish regulation for marketing compost
                        | - Promoting garden and green spaces in land use planning
                        | - Collaboration with mining companies for using composting in land filling. |
| Short-term actions     | o Establish a pilot programme for targeting local community |
|                        | o Establish a pilot programme for Trash Bank and 3R Center |
|                        | o Organise 3R training targeting schools (teachers/students) in the city |
| Partnership with other stakeholders | o Hold meetings with private sector to join the city’s programme through CSR |
| Policy and institutional| o Compile relevant Mayor’s regulation (PERWALI) and standards for operation |
### Summary Sheet of Follow-up Actions

<table>
<thead>
<tr>
<th>Name of the City</th>
<th>Palembang, Indonesia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal for waste reduction</td>
<td>10% waste reduction by 2015 (based on 2011)</td>
</tr>
</tbody>
</table>
| Long-term strategies | ▪ Strengthen the staff capacity to support community-based composting and 3R promotion  
▪ Formalise on-going activities in the area of eco-community programme |
| Short-term actions |  
▪ Promote composting at household/community level  
  - Operation and monitor of pilot programme at 5 neighbourhoods and 6 schools.  
  - Organise and promote the eco-friendly village concept  
  - Strengthen existing partnership with NGOs, private sector and farms  
  - Provide capacity building for relevant staff |
| Establishment of material recovery facility | Promote Trash Bank through the eco-friendly village concept |
| Awareness raising and environmental education | Organise training targeting environment carders and school teachers |
| Partnership with other stakeholders | Strengthen the staff capacity to support community |
| Policy and institutional | Establish the material recovery facility in 10 barangays based composting programmes |
|          | Promote collection activities in the area of eco-community programme |

<table>
<thead>
<tr>
<th>Name of the City</th>
<th>Tarakan, Indonesia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal for waste reduction</td>
<td>20% - 50% waste reduction by 2015 (based on 2011)</td>
</tr>
</tbody>
</table>
| Long-term strategies | ▪ Promote waste separation at source  
▪ Promotion of composting for organic waste treatment |
| Short-term actions |  
▪ Promote composting at household/community level  
  - Establish 5 community-based composting programmes  
  - Establish Trash Bank in those pilot communities  
  - Implement "Tabungan Lingkungan Programme" (TALING) in 16 schools in Adiwiyata  
  - Build partnership with media and academic sector |
| Establishment of material recovery facility |  
▪ Implement "Tabungan Lingkungan Programme" (TALING) in 16 schools in Adiwiyata |
| Awareness raising and environmental education |  
▪ Implement "Tabungan Lingkungan Programme" (TALING) in 16 schools in Adiwiyata |
| Partnership with other stakeholders |  
▪ Build partnership with media and academic sector |
| Policy and institutional |  
▪ Establish the quality standards for composting  
▪ Create waste disposal policy |

<table>
<thead>
<tr>
<th>Name of the City</th>
<th>Sibu, Malaysia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal for waste reduction</td>
<td>10% - 15% waste reduction by 2015 (based on 2011)</td>
</tr>
<tr>
<td>Long-term strategies</td>
<td>▪ Share the experiences with neighbouring cities</td>
</tr>
<tr>
<td>Short-term actions</td>
<td></td>
</tr>
</tbody>
</table>
▪ Promote composting at household/community level  
  - Manage existing composting plant in collaboration with private company  
  - Establish a system for composting the market waste in the city  
  - Identify neighbourhoods for replication of composting programmes |
| Establishment of material recovery facility | Monitor recycling activities in the city through 66 recycling stations (bins) |
| Awareness raising and environmental education |  
▪ Education and demonstration programme at schools  
▪ Organise Love Earth Day in April every year. |
| Partnership with other stakeholders |  
▪ Partnership with neighbourhood associations |
| Policy and institutional | Document and share successful experiences with other cities |

<table>
<thead>
<tr>
<th>Name of the City</th>
<th>Kampar, Malaysia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal for waste reduction</td>
<td>22% waste reduction by 2020 (based on 2011)</td>
</tr>
<tr>
<td>Long-term strategies</td>
<td>▪ Networking and dissemination of information with 13 other local authorities in the area.</td>
</tr>
<tr>
<td>Short-term actions</td>
<td></td>
</tr>
</tbody>
</table>
▪ Promote composting at household/community level  
  - Establish a compost center at the market  
  - Replicate household composting into 2 neighbouring areas  
  - Register existing recyclers in the city and monitor their activities |
| Establishment of material recovery facility |  
▪ Establish new Material Recovery Centre in 10 barangays  
▪ Implement “Tabungan Lingkungan Programme” (TALING) in 16 schools in Adiwiyata |
| Awareness raising and environmental education |  
▪ Implement ‘Tabungan Lingkungan Programme’ (TALING) in 16 schools in Adiwiyata |
| Partnership with other stakeholders |  
▪ Establish civil society council to oversee the activities  
▪ Strengthen partnership with local authorities |
| Policy and institutional |  
▪ Policy for integrated environmental planning and management |

<table>
<thead>
<tr>
<th>Name of the City</th>
<th>Cebu, Philippines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal for waste reduction</td>
<td>25% waste reduction by 2015 (based on 2011)</td>
</tr>
</tbody>
</table>
| Long-term strategies | ▪ Establish composting and material recovery facility for each barangay under the RA903  
▪ Separated waste collection and band of open dumping |
| Short-term actions |  
▪ Promote composting at household/community level  
  - Develop composting activities in 6 barangays  
  - Establish the material recovery facility in 10 barangays |
| Establishment of material recovery facility |  
▪ Organise training for barangay environmental officers  
▪ Publish KitaQ manual in local language  
▪ Promote composting and material recovery facility in partnership with private sector, NGOs and barangay officials |
| Awareness raising and environmental education |  
▪ Regulations for separated waste collection and band for open dumping  
▪ Policy for integrated environmental planning and management |
Waste Reduction through Composting: Application of Surabaya’s Model

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

A case of Surabaya, Indonesia

Population: 3 million
2nd largest in Indonesia

Environmental cooperation with Kitakyushu City since 2001

Background

Status in 2001

Current Status

New Bonowo Landfill: 800 scavengers; 315km from city centre;
Surrounded by fish ponds; demand for waste reduction is high

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

Waste Composition in Surabaya

Organic waste shares more
than half (as much as 70-
80%) of total amount of waste
generation

Prioritize reduction of
organic waste

Promote composting
A) at each household
B) at composting centres

Inputs by the city

15 composting centres
in Surabaya City

Inputs by the city

Total number of household compost baskets distributed
for free by Surabaya City

Number of composting centres
OUTPUT: WASTE REDUCTION

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

- 1,500t/day (2007)
- 1,300t/day (2008)
- 1,150t/day (2009)
- 1,000t/day (2009)

20% reduction in 4 years!
30% reduction in 5 years!!

Social and environmental benefits

Better household environment
Greener and cleaner streets
Environmental education tools

Output: waste reduction

100t/d reduction by household composting,
50t/d reduction at composting centres,
Composting capacity: 150t/day

Composting at 15 composting centres:
Cleansing Department: 14 composting centres, 50t/d (+100m3/d)
PUSDAKOTA (NGO): 1 composting centre, 14t/d

reduction by Reuse and Recycling.

Open Green Area Development in Surabaya

<table>
<thead>
<tr>
<th>Name of Park</th>
<th>Type</th>
<th>1995</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tjampuhan</td>
<td>Public Park</td>
<td>0.48</td>
<td>0.50</td>
</tr>
<tr>
<td>Teluk Rubiah</td>
<td>Beach</td>
<td>0.9</td>
<td>1.0</td>
</tr>
<tr>
<td>Pusako</td>
<td>Public Park</td>
<td>0.34</td>
<td>0.34</td>
</tr>
<tr>
<td>Bajul Mati</td>
<td>Public Park</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>Tjapitulun</td>
<td>Beach</td>
<td>0.1</td>
<td>0.1</td>
</tr>
</tbody>
</table>

Source: Surabaya City Health Department Data 2010

Cited from Surabaya City’s presentation
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),

**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

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

Efficient Composting Method
- High productivity (within 2 weeks)
- Using only local materials
- No offensive smell, no leachate
- Fast, cheap and good quality!
A Follow-up Seminar of KitaQ System Composting In Asia 18 July 2012, JICA Kyushu

**COMPOSTING METHODS**

- Conventional open-waste system (fermentation under anaerobic and low-temperature conditions)
- Organic waste is used as seed compost
- Fermentation in a heap for 2 to 6 months by controlling the temperature
- Collection of fermentation microorganisms
- Active microorganisms in compost enriches the soil

**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

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**Surabaya’s successful solid waste management model**

**Financial Analysis of Composting Practices**

- Is composting financially sustainable?

**Costs of composting promotion**

Expenditure of Cleansing Department Surabaya, 2006-2008

- Promotion of composting and waste segregation (only 1-2% of the total solid waste management expenditures)
- Land procurement for a new landfill site
- Management of final disposal site
- Procurement and maintenance of waste management equipment and facilities
- Annual solid waste management costs: USD10 million per year
- Administrative expenses
- Waste collection and transportation
- Park management

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**Is operation of a composting centre financially sustainable?**

- PUSDAKOTA (NGO)’s composting centre: 1.4T/day collection → 40T/month collection → 10T/month of compost production
- Sales of compost: 10T/month @ USD100/t → Income USD1,000/month
- Expenditure: USD650/month (incl. labor and utility costs)
- Profit: USD350/month = USD4,200/year
- Can purchase a new shredder!! (If all the compost is sold...)

- Plus, cost saved from waste reduction (40T/month)
  - Hidden profit: 40T/month x USD23/t = USD900/month = USD31,000/year
  - City government may think about giving a subsidy for building a composting centre.
How much did the city save by reducing waste?

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 = USD60,000/month

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

Profit: USD40,000/month

Cost recovery in 2.5 years!

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: 100m² → Compost production: 6t/m
(Income: USD600/month)
• 3t/day (90t/m) of waste input: 200m² → 18t/m (USD1,800/m)
• 5t/day (150t/m) of waste input: 300m² → 30t/m (USD3,000/m)

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 = USD414,000/year

Cost recovery in 1 year!!

Recommended for other cities to achieve 10-20% waste reduction in 3 years
**Aerial View of Kemunyan Sanitary Landfill, Sibu**

*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

- **INDONESIA**
  - Surabaya
- **PHILIPPINES**
  - Bago
  - Talisay
  - Cebu
  - Puerto Princesa
  - Cavit
- **THAILAND**
  - Bangkok
  - Sri Lanka
  - Sankamphaeng

- **NEPAL**
  - Lalitpur

- **MALAYSIA**
  - Sibu
  - Kuala Lumpur
A Follow-up Seminar of KitaQ System Composting in Asia
18 July 2012, JICA Kyushu

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 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 Talisay, Philippines

Composting Workshop in December, 2008 in Talisay

Day 1
Day 11

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

Workshop in Bangkok in May 2009

IGES | http://www.iges.or.jp
Kitakyushu Asian Center for Low Carbon Society | http://www.asiangreencamp.net/
Replication in 5 cities in Indonesia

Central Jakarta City
Makassar City
Palembang City
Tarakan City
Balikpapan City

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

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.