

United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP),  
Institute for Global Environmental Strategies (IGES),  
The City Government of Kitakyushu, Japan, and  
The Bangkok Metropolitan Authority (BMA)

Kitakyushu Initiative for a Clean Environment  
Workshop-Training on Organic Waste Composting: Resource Recovery for a Sustainable Solid  
Waste Management  
10-12 March 2009, Bangkok, Thailand

## **Summary of the Workshop (Notes by the Secretariat)**

### **Overview and the background:**

1. The “Workshop-Training on Organic Waste Composting: Resource Recovery for a Sustainable Solid Waste Management” was organised by Institute for Global Environmental Strategies (IGES), United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), City Government of Kitakyushu, Japan and Bangkok Metropolitan Administration (BMA), Thailand on 10-12 March 2009 at Century Park Hotel and Din Daeng Composting Centre in Bangkok as an activity of Kitakyushu Initiative for a Clean Environment, a UNESCAP programme, for which IGES serves as a secretariat.
2. The workshop aimed to assist local governments in improving their solid waste management practices, particularly reducing the total amount of waste generation by adopting composting practices of organic waste, which usually shares more than a half of total amount of municipal solid waste. For that purpose, a number of good waste management practices were presented including widespread composting practices in Surabaya, Indonesia, similar activities in BMA and other cases in five Thai cities and two other cities in Malaysia and Nepal.
3. The workshop comprised of a seminar on the first day and a hands-on composting training on the following two days. The seminar was organised for decision makers and directors of waste management division of each city to discuss possible supporting policies to promote good waste management practices, while the composting training was held for waste management practitioners who actually operates composting centres and can be trainers of composting practices in each city. In this way, organisers designed the workshop to promote actual application of good practices in each city after the workshop.
4. There were representatives from 22 Thai cities and municipalities including Chiang Mai, Chiang Rai, Chonburi, Hatyai, Karon, Khoka, Lampang, Nakhonratchasima, Nonthaburi, Pathumthani, Pattanne, Phitsanulok, Phuket, Rayong, Samrongthai, Sankampaheng, Sriratcha, Sri Saket, Thakham, Thep Krasattree, Udonthani and BMA and six districts in BMA. There were also nine cities from six other countries which include Kathmandu and Lalitpur,

Nepal, Hanoi and Ho Chi Minh, Viet Nam, Siem Reap and Pursat, Cambodia, Sibul, Malaysia, Surabaya, Indonesia and Kitakyushu, Japan. In addition to them, there were participants from other divisions of BMA, central government, NGOs, private companies, universities, research institutes and JICA Thailand and Nepal. As a result, the total numbers of participants for the seminar on the first day and the training on the following two days were 88 and 66, respectively. The unexpected large number of participating Thai cities largely owes to kind supports and effective promotion by BMA and Energy and Environment Development Foundation (EED), a special organisation which plays an advisory role for many Thai cities in energy development and environmental management including waste management.

5. Prior to the workshop, another similar workshop was held by BMA for district officers and community leaders in Bangkok in November 2008, which had more than 130 participants from 36 districts as well as several other municipalities, NGOs and private companies. Din Daeng Composting Centre, where composting trainings were held this time, was established at that time through technical supports rendered by Kitakyushu City and IGES as a showcase of a market waste composting centre. Subsequently, BMA has also held a series of seminars for district officers to promote composting practices at each household by distributing samples of household compost baskets and composting manuals to district officers together with some budgets for replication. As such, previous workshop was held to expand those practices within BMA, while this one aimed to expand that to other cities beyond BMA and also to learn from other practices in other cities.

#### **Waste management seminar on the first day:**

##### **Session 1:**

##### **The Deputy Governor of Bangkok expressed his support for the project.**

6. The workshop was opened by the Deputy Governor of Bangkok wherein the importance of sorting the waste, especially the organic waste, at source and promotion of composting practices were stressed as an effective means to reduce the amount of waste as well as methane production at landfills. Following that, IGES introduced the background and objectives of the workshop and the course of the programme and UNESCAP introduced the major challenges in the Asia-Pacific region, prominently poverty and environmental degradation caused by rapid urbanisation and the concept of “Green Growth” approach that seeks to harmonise the economic growth and environmental conservation in a sustainable manner. Another co-organiser, Kitakyushu City concluded the session by introducing its history of the industrial pollution and how it has overcome that to be one of the environmental model cities in Japan today. Kitakyushu City also explained its city-to-city environmental cooperation partnerships with several Asian cities including Bangkok and expressed its intention to look for other potential partner cities in Thailand.

##### **Session 2:**

##### **Surabaya’s waste management model and its replication in Bangkok presented.**

7. During the first session, Surabaya City presented a successful waste management model which BMA has been replicating partially. The presentation highlighted that the turning point was a closure of the only final disposal site in the city by the opposition of the

residents in 2001 while the waste filled the streets and drains during the transition period until the new one was developed. Since then, the city government started a number of waste management activities by actively involving communities, NGOs and private companies, which include:

- a) Organising a community environmental cadre system, which has more than 20,000 members citywide, in cooperation with PKK (women's group) and NGOs to implement waste segregation at source;
  - b) Distributing more than 10,000 household compost baskets and 600 compost barrels for free through environmental cadres;
  - c) Establishing 12 composting centres which process a large amount of organic waste from markets and street sweepings; and
  - d) Organising a Green & Clean Campaign with private partners to encourage waste management at community levels.
8. Mr. Koji Takakura, a composting expert who developed the composting method in Surabaya as a key engineer, supplemented the presentation by introducing the key features of the method compared to other conventional methods including its rapid processing period for 1-2 weeks, operability in a small space, low-cost operation due to limited mechanical inputs and usage of only local materials, no foul smell and seepage, applicability at a household level and also at a large composting centre, and the applicability in Thailand. Following that, BMA presented how it has replicated Surabaya's composting practices in Bangkok. With technical assistance by Mr. Takakura, BMA has developed a model composting centre in Din Daeng District and has distributed household compost baskets and composting manuals to more than 30 districts in BMA. Pollution Control Department (PCD), Ministry of Natural Resources and Environment (MoNRE), supported the practices by BMA in line with the national policy which promotes 3Rs (reduce, reuse and recycle) concept and participation of the public and private sectors in waste management. PCD also stressed the importance of waste reduction and separation at source for waste diversion through composting, energy recovery and material recovery before final disposal.

**A set of local policies for 10% waste reduction proposed.**

9. IGES recaptured the inputs and key achievements in Surabaya as well as its economic, environmental and social impacts as follows:
- Surabaya City has reduced the average daily amount of waste disposed at the final disposal site from more than 1,500 tonnes in 2005 and before to 1,300 tonnes in 2007 and 1,150 tonnes in 2008.
  - The amount of organic waste composted in the city is 80 tonnes a day at most compared to more than 200 tonnes of waste reduction a day. It implies that promotion of composting at source automatically encourages reducing, reusing and recycling of other types of waste such as paper, plastic, glass and metal, which amount is larger than that of organic waste composted.
  - Surabaya City has achieved the significant waste reduction by allocating only 1-2% of its waste management budget for community empowerment activities, which include

operations of 12 composting centres, distribution of thousands of household compost baskets, supporting activities of environmental cadres and NGOs and organising Green & Clean Campaign.

- The unit solid waste management cost in Surabaya is about USD23 per tonne by dividing the annual solid waste management cost and construction cost of the final disposal site by the total amount of waste generated.
- The operations of composting centres are financially sustainable by accounting the waste reducing effect. For example, 12 composting centres in Surabaya process about 40 tonnes of organic waste a day, or 1,200 tonnes a month, which correspond to savings of USD27,600 a month of waste management cost of the city, compared to the monthly operational expenditures of USD3,600. In addition, there are 300 tonnes a month of compost production which replace the procurement of chemical fertilisers by the city.
- Distribution of thousands of household compost baskets for free by the city also makes business sense by accounting the waste reducing effect. For example, the distribution of 1,000 baskets cost USD20,000 for the city including the material and delivering costs, but the waste reducing effect is one tonne a day, or 30 tonnes a month and 360 tonnes a year, assuming each household processes one kilogram of kitchen waste a day, which correspond to more than USD8,000 of savings of waste management cost in a year. In other words, the payback period of the initial distribution cost is 2.5 years and the effect lasts continuously.
- The incentives for people to practice composting at each household are not only the income by selling the compost but also using that for plants and gardens and keeping the household environment clean and disease free.

10. Following that, IGES concluded the session by proposing a set of supporting policies for waste reduction for local governments as well as for BMA based on Surabaya's achievement as follows:

- a) Set up market-waste composting centres and use the compost products at city parks by replacing the procurement of chemical fertilisers;
- b) Support community groups and NGOs to set up community composting centres and encourage segregated waste collection from households;
- c) Distribute household compost baskets for free through involving community groups and NGOs and organising community environmental leaders for the distribution and monitoring;
- d) Organise a community-based waste management campaign in cooperation with private companies and mass media to encourage communities in cleaning and greening the neighbourhood;
- e) Start a compost purchasing scheme from residents and community composting centres using the waste management cost saved from the waste reduction and promote its use at city parks and farm yards by distributing for free at first; and
- f) Cooperate with Kitakyushu City and IGES to design the project and provide technical assistance depending on the needs.

Proposals particularly for BMA to achieve its target of 15% waste reduction by 2012 as manifested by the Mayor in 2007 are as follows:

- a) Set up market-waste composting centres with a total processing capacity of 200 tonnes a day by establishing a centralised one at On Nut Waste Transfer Station using the existing underutilised facility and replicating the model in Din Daeng District in many other districts; and
- b) Distribute 10,000 household compost baskets a year for free.

### **Session 3 & 4:**

#### **Other composting practices in Thailand and other Asian cities presented.**

11. Five cities and municipalities in Thailand, namely Nonthaburi, Sankamphaeng, Sriracha, Nakhonratchasima and Phitsanulok, and two other cities from abroad, namely Sibul, Malaysia and Kathmandu, Nepal, shared their experiences in composting as well as waste management in general. The findings are that all of the cities encourage waste segregation at source by actively involving communities in waste management. Composting is regarded as an effective means to reduce the amount of waste and various kinds of methods are applied such as a mechanically sophisticated type with a forced aeration system (Nonthaburi), open windrow (Sankamphaeng, Phitsanulok and Sibul), liquid fertiliser (Sankamphaeng and Sriracha), anaerobic digestion (Nakhonratchasima), vermi and compost bins (Kathmandu). Waste banking is also a popular approach at schools and communities for which cities support the activities by coordinating the buyers and also being the buyer per se of the recyclables and compost products (Korat, Sriracha and Kathmandu). Further, some cities discouraged the use of plastic bags (Phitsanulok) and organised ward environment committees to plan and monitor the waste management practices at a household level (Kathmandu). As a result, some cities have recorded significant waste diversion and reduction (Nonthaburi, Phitsanulok and Sibul). It was confirmed that there are many ways to reduce the amount of waste generation and cities can learn from other cities' experiences and adopt those practices.

#### **Site visit:**

##### **A model composting centre introduced.**

12. After the seminar, the composting method developed in Surabaya and widely adopted in many other cities including Bangkok was introduced to the participants at Din Daeng Composting Centre, where approximately 500 kilograms of organic waste from markets is processed every day in about a week. Those who had registered and were interested in learning the concepts and operational techniques of the method were invited to join the trainings on the following two days.

##### **Two-day hands-on composting trainings:**

##### **Forty-four participants passed the composting certificate exam.**

13. The trainings comprised of a half day lecture in the morning followed by a half day hands-on training in the afternoon for two days. The lecturer was Mr. Takakura, who developed the method, and the objective was to train the trainers and replicate similar

practices in other cities. There were 66 participants including representatives from 18 Thai cities and municipalities, namely Bansuan, Chiang Mai, Chonburi, Lampang, Nonthaburi, Pathumtani, Pattanee, Phitsanulok, Phuket, Ravong, Samutprakan, Sattahip, Songkla, Sri Saket, Ta Kham and Udonmai, seven districts in BMA, namely Din Daeng, Don Mueng, Huai Khwang, Laksi, Min Buri and Nongjok, eight cities from abroad, namely Kathmandu and Lalitpur, Nepal, Hanoi and Ho Chih Minh, Viet Nam, Siem Reap and Pursat, Cambodia, Sibul, Malaysia, and Surabaya, Indonesia, university students, teachers, private companies and some other organisations. Among them, 44 participants took the certificate exam at the end of the training course and all of them passed that. Most of the participants acknowledged the effectiveness of the method and expressed the willingness to replicate that in their each city and organisation.

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The participants expressed their appreciation to the host city BMA for the successful organisation of the workshop and warm hospitality after the seminar on the first day and the two-day composting trainings.

#### **Follow-up and the outcomes of the workshop:**

14. After the workshop, representatives from Kitakyushu City and Mr. Takakura visited a composting centre in Sankamphaeng to provide technical assistance for improving the productivity which was coordinated by Regional Department of Natural Resources and a JICA Expert. The delegates also visited Chiang Mai on the way to Sankampaheng to discuss the acceptance of a trainee in Kitakyushu City as an activity of city-to-city environmental cooperation. Kitakyushu City maintains its cooperative relationships with Sriracha and BMA and continues supporting the improvement in waste management in those cities. There was also a discussion to extend technical supports for waste management, especially the operation of an incinerator, in Phuket by Kitakyushu City which requires more coordination. Meanwhile, IGES visited Nakhonratchasima after the workshop together with Energy and Environment Development Foundation (EED) to observe the waste management status of the city and identify the areas for further cooperation. Kitakyushu City and IGES also visited JICA Thailand Office to discuss appropriate modalities to facilitate replication of similar practices in other Thai cities in association with existing JICA schemes in Thailand. Meantime, it was reported that the replication of composting practices have started in Lalitpur, Nepal and Sibul, Malaysia. Now, a similar workshop is scheduled in Sibul and Kuala Lumpur for similar objectives in July 2009 with supports by JICA Malaysia. In this way, there are some approaches and actions made by Kitakyushu City, IGES and other participating cities as well as some actual outcomes following the workshop.