

A Networking Seminar on KitaQ System Composting in Asia



SEMINAR REPORT

29 June – 01 July 2011

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 Networking Seminar on KitaQ System Composting in Asia held in Kitakyushu, Japan during 29 June – 01 July 2011. It was edited by D.G.J.Premakumara and H. Kazuyoshi in IGES with the assistance of H. Jian, A. Mutsumi and S. Risako. The authors would like to thank all the participants for their contribution. A special thank also goes to Dr. Yoshida and Mr. Yao, JICA for their valuable expertise given in organising the workshop sessions as well as Ms. Tamura and Mr. Kodama, JICA Kyushu, Mr. Mitoma, Kitakyushu City, Mr. Nagaishi and Ms. Morimoto, KITA, Mr. Maeda and Ms. Murakami, IGES and Mr. Takakura and Ms. Yaoya, J-POWER group/JPec for their valuable support and technical inputs in organising this seminar.

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Published by

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Printed in Japan

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29 June-01 July 2011

*Japan International Cooperation Agency,
Kyushu International Center,
Kitakyushu, Japan*



DAY 1: 28 June

A Courtesy Visit to Kitakyushu City Office



DAY 2: 29 June

Welcoming Remarks



Presentations from Each Participating City



DAY 3: 30 June

Discussions on Capacity Development in Solid Waste Management



Site Visit to Ano Community Center



DAY 4: 1 July

Site Visit to Bin/Can Center



Presentations on Action Plans of Respective Cities



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1. Summary

Solid Waste Management (SWM) is considered to be one of the most serious environmental issues confronting urban areas in Asia. The growth of urban populations and economies has resulted in a corresponding growth of solid waste that local governments are finding difficult to manage. Existing dumpsites are reaching capacity and finding new candidate sites for dumpsites is becoming increasingly difficult. The solution lies in reducing the amount of waste that reaches dumpsites. Composting of organic waste is considered not only to be an effective measure for municipal solid waste reduction, but for raising environmental awareness and community building as well, especially in developing countries, where organic waste accounts for more than half of the total amount of waste. The Japan International Cooperation Agency (JICA) is also taking steps to apply composting through its various environmental programmes aiming to promote the 3Rs (reduce, reuse and recycle) around the world.

The KitaQ System Composting evolved from the experiences of Surabaya's Solid Waste Management Model. It was first piloted in Kampong Rungkot Lor, an urban community adjacent to Surabaya's largest industrial site, where a local non-governmental organisation (NGO), Puskakota, with technical assistance provided by the Kitakyushu International Techno-Cooperative Association (KITA), encouraged the community to separate waste at source. The organic waste is then collected separately and treated at a nearby composting centre adopting the Takakura Method of composting, a simple composting method introduced by Koji Takakura of J-POWER group/JPec, utilising locally available fermentation microorganisms or native microorganisms (NM), rather than effective microorganisms (EM). The material recovery facility (MRF) was established to collect inorganic materials and linked them with existing informal recycling businesses.

The organic material easily putrefies and emits foul odours unless it is treated properly. The Takakura Method of composting dissolved many of the organic components of raw garbage in a short period of time (particularly in the tropics) by cultivating fermentation microorganisms from locally available materials such as fruit skin, fermented foods, rice bran, chaff and leaf mould, and mixing the cultivated microorganisms with organic waste to achieve natural fermentation. Further, the method is simple and economically viable as it requires only readily available materials and emits no foul odours and leachate.

The pilot project brought about various benefits in addition to the production of compost, such as extra economic opportunities for community members, improved sanitary conditions and a greener and cleaner environment. Based on this success, Surabaya City started to support the decentralised, community-based composting programmes at the city-wide level, building partnerships with other stakeholders, such as the women's network (PKK), local NGOs, academic institutions, waste pickers, private ventures and the media, in heavy contrast to centralised, larger-scale and highly technical composting methods. This supportive policy environment has helped to reduce the amount of waste being transported to final disposal sites by as much as 30% within six years, enhanced recycling by removing organic matter from the waste stream and improved the city's overall waste collection system. Surabaya's achievement exemplifies how a city can reduce a large amount of waste in a short period of time with a limited budget by integrating composting into municipal solid waste management, emphasising decentralised, community-managed methods with appropriate technology,

enabling participation of various stakeholders, and providing supportive policy and capacity building.

Utilising the Kitakyushu Initiative for a Clean Environment (KI), a programme of the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), which was adopted at the 4th Ministerial Conference on Environment and Development in Asia and the Pacific (MCED4) held in Kitakyushu, Japan in 2000, Kitakyushu City, KITA, and the Institute for Global Environmental Strategies (IGES) has worked together to share Surabaya's successful waste management model with other cities in Asia. It was further used in JICA technical cooperation projects for solid waste management and training programmes for overseas participants and Japan Overseas Cooperation Volunteers (JOCVs). This was followed by reports of other successful applications by local governments mobilising support from various sources. For this reason, the Takakura Method of composting has become a popular technology for organic waste recycling, and the applicable model of municipal composting in cities has become known as the KitaQ System Composting.

Against this background, a regional seminar was organised in Kitakyushu City from 29 June to 1 July 2011, inviting related cities and organisations to share and discuss their successful experiences and challenges in promoting the KitaQ System Composting in municipal solid waste management in Asia, develop/promote relationships and identify areas for future cooperation. The seminar further assisted participants in:

- assessing good practices and challenges in waste management in respective cities,
- developing networks among related cities and organisations which are promoting composting of organic waste for further cooperation in the future, and
- assessing needs to develop capacity building materials for KitaQ System Composting.

The seminar was attended by 20 participants representing 10 cities from Asia, including cities from Indonesia (Balikpapan, Makassar, Palembang, Semarang, Surabaya, Tarakan), Philippines (Cebu), Malaysia (Sibu, Kampar), and Thailand (Nonthaburi), plus a number of additional speakers and observers from the host country, Japan. Invited participants included representatives from respective local governments. The seminar featured presentations, interactive discussions and site visits. The second and third days of the seminar were made up of workshops, both in small group discussions and in plenary sessions, which were designed to draw on the lessons learnt from the city presentations in the first day.

The participants identified the following promotional factors that create a favourable environment for the composting of municipal solid waste management (MSWM): increasing waste generation, inadequate collection and uncontrolled disposal of solid waste; high proportion of organic waste; recent efforts at global, national and local levels in promoting the 3Rs; strong political interest and support; public education, awareness and pressure; partnerships with relevant stakeholders; existing knowledge and pilot programmes on composting; and existing networks with international agencies.

Further, it was identified that the decentralised, community-based approach of the KitaQ System Composting is effective for cities in reducing waste generation due to its low financial costs, and thereby facilitates the establishment of a sound material-cycle society. The composting process can be initiated with very little capital and low operating costs, is flexible for implementation at the household, community and city-wide levels, integrates

existing informal sectors involved in the MSWM, and provides excellent opportunities to improve the city's overall MSWM system. As well, the Takakura Method, a composting technology in the KitaQ System Composting, is also simple, easy-to-follow, locally-relevant and has great potential to be transferred, adapted and replicated without too many outside resources.

By all accounts, the seminar and workshop were successful in achieving planned objectives. A key outcome of the seminar was a commitment of the participants to take initiatives in planning, design and implementation of community-based composting programmes at the city level, taking into account their specific situations in collaborating with other organisations, entities and local residents. They further identified the importance of the following actions to promote successful community-based composting programmes, such as strong political will and commitment; integrated SWM strategies developed with the involvement of all stakeholders; inter-departmental coordination and networking with other organisations; clear guidelines and education programmes for waste separation, collection, transportation and composting; integrating informal recycling systems; strong community leadership and public participation; establishing both community award systems and legal enforcement to motivate community participation; and enabling policies, laws and regulations.

The participants further agreed to work together regardless of borders and share their knowledge and experience so that they might help each others to promote composting in SWM in their cities. Participants also noted that this type of seminar was very useful as a forum for sharing knowledge and information, so that those with less understanding and experience could benefit from those with more experiences, and recommended that it be repeated regularly to advance this endeavour. Another key message that emerged from the seminar was the importance of establishing the KitaQ System Composting network involving key organising institutions (JICA Kyushu, Kitakyushu City, KITA and IGES) in order to raise awareness and educate all stakeholders about relevant issues and to increase capacity among the participants, begin new training programmes, document best practices and develop training manuals for knowledge transfer and technical cooperation in SWM from the perspective of capacity development.

2. Proceedings

The seminar consisted of plenary presentations and interactive discussions, site visits and was followed by workshops and break-out sessions. Presentations and conclusions are summarised below. All speaker presentations as well as supplementary materials, such as the seminar background paper and list of participants, are attached in the annexes.

Wednesday, 29 June

2.1. Opening Ceremony and Introduction to Seminar

2.1.1. Welcoming Remarks

- *Mr. Keiichi Muraoka, Director General, JICA Kyushu*
- *Mr. Hiroshi Imanaga, Director General, Environmental Bureau, Kitakyushu City*

The seminar officially started with welcoming remarks from Mr. Keiichi Muraoka, Director General of JICA Kyushu. He warmly welcomed the participants from different countries to the seminar. Mr. Muraoka then highlighted the environmental impacts of cities in Asia and briefly explained JICA's involvement in the field of environmental management, such as air pollution, water pollution, waste management and climate change measures. He further emphasised that composting is an effective method to reduce organic waste that needs to be dumped and can be easily replicated in many cities in Asia. For this reason, this seminar provided a good opportunity for participants to share good practices, discuss lessons learned and strengthen networking.

Following this, Mr. Hiroshi Imanaga, Director General of the Environmental Bureau, Kitakyushu City, welcomed the participants. He explained that since 1980, Kitakyushu City has been engaged in international environmental cooperation in Asia. 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, KITA, and the City of Kitakyushu. One of its very successful initiatives was the promotion of composting in Surabaya City. As a result, Surabaya City has been successful in reducing its waste generation by 30% with the adoption of composting and raising public awareness. Mr. Imanaga also stressed that this composting method can be applied in other cities in Asia.

2.1.2. Introduction to Seminar and JICA Training Activities in KIC (Kyushu International Center)

- *Mr. Akihiko Kodama, Training Programme Division, JICA Kyushu*

Mr. Akihiko Kodama, Training Programme Division, JICA Kyushu, gave a brief introduction to the seminar. He explained the activities of JICA Kyushu and gave some examples of public participation and training programmes. Public participation programmes include the Japan Overseas Cooperation Volunteers (JOCV) programme and JICA partnership programmes; training programmes focus on environmental management, energy and resources, such as waste management techniques and environmental education. As of 2010, JICA Kyushu has conducted 146 training programmes, inviting 823 participants from 97 countries. Among them, 333 participants attended 39 training programmes on environmental

management and energy and resources.

Mr. Kodama further explained JICA's strategy on solid waste management (SWM) and emphasised the importance of building a sound material-cycle society, developing the capacities of governmental organisations, improving collection, transportation and disposal and promoting activities to address climate change issues. After that, he explained the purpose of the seminar and mentioned that the main objective was to share good practices and challenges and enhance partnership among participant cities. He further stated that presentations by participant cities, related organisations and experts would be highlighted at the workshop, site visits and observations would be carried out at an organic farming compost site and community activities in the Ano community centre and recycling facilities, and that a workshop session would be held to facilitate discussions among participants.

2.2. Lessons Learned: Solid Waste Management and Composting in Asian Cities

During the session of lessons learned, a representative from each city made a presentation about SWM and composting in their respective cities. The participants were provided guidelines prior to the seminar to help in the development of their presentations and were requested to consider the following topics, such as a basic introduction to the city; overview of solid waste management, trends and strategies; composting in municipal solid waste management; success factors, barriers and challenges in promoting composting in SWM; required international assistance and a conclusion to the presentation.

2.2.1. Balikpapan, Indonesia

- *Mr. Arie Soetjiadi, Expert Staff, Conservation of Natural Resources, Environmental Agency, Balikpapan City*

Balikpapan City is located in East Kalimantan and has a total population of 614,681 (2010). The total land area of the city is 503.33 sq. km and 85% of the city is covered with hilly areas. The total waste generation in the city is 160 tons per day and more than 60% is organic waste. Mr. Arie explained that Balikpapan City has developed a SWM strategy to reduce the waste to be disposed by 10% in the next three years, and tried to improve the legal system and raise public awareness toward environment conservation, including solid waste management. Some of the key points from his presentation are as follows:

- Currently, the city has only treated about 70% of the total waste generated. The remainder is not collected.
- Though the city has spent 35% of the SWM budget for operational waste disposal services, only 1% is allocated to composting.
- The municipality has developed the vision of a “clean, beautiful, and comfortable city” under the Community-Based Solid Waste Management (Pengelolaan Sampah Berbasis Masyarakat – PESAMAS) project, which drives all environment activities in the city.
- Both through formal and non-formal education, the municipality is involved in raising public awareness on environmental issues in general and SWM, specifically.
- Currently, Balikpapan City has eight composting programmes at the household, neighbourhood and city levels that have been initiated by different stakeholders, such as NGOs, the private sector, city government and the provincial government.

- The market mechanism for composting is not yet fully functioning. Thus, composting activities are still limited. The final composting product from the compost centres operated by the city office is used for public parks and greenery. As well, there are problems in marketing the compost produced by NGOs and communities.
- The successful factors for the progress of SWM and composting are incentives via Adipura awards and enforcement of environmental regulations.
- The key barriers are a lack of awareness and poor service coverage due to the city's hilly topography and poor spatial planning.
- The municipality requires assistance in improving urban planning, developing an approach to strategy planning to alert the people about the importance of proper waste management, policy advocacy, capacity building for relevant stakeholders, and extending possibilities to market compost products.
- The city has tried to solve these issues by improving urban planning and policymaking abilities.

2.2.2. Makassar, Indonesia

➤ *Mr. Andi Murtan, Chief of Urban Cleaning Management Division, Makassar City*

Makassar City had a total population of 1,339,374 in 2010. According to Mr. Andi, the city has faced tremendous challenges in SWM and key points from his presentation are as follows:

- Due to a lack of appropriate facilities and infrastructure, the collection of waste has been inadequate. The city collects only 80% of waste generation in the city.
- There has been an increase in waste generation in line with population growth and urban functions. Further, the city is facing some other issues in SWM, such as high disposal cost, high transporting cost, and unclear assignment of roles for local societies and businesses.
- As a result, the municipality has tried to formulate a new SWM system and action plan based on the 3Rs with support from JICA and Kitakyushu City under the PESAMAS.
- Under this new SWM strategy, the city is aiming to reduce the waste to be disposed by 5-10% within the next three years by promoting waste separation at source and establishing composting programmes at household and neighbourhood levels.
- The municipality is planning to establish three composting centres by 2012, carry out campaigns to raise public awareness, promote recycled products, and enhance monitoring of environmental management projects. Further, the city has planned to develop manuals for community-based solid waste management and training programmes for capacity development for city staff.

2.2.3. Palembang, Indonesia

➤ *Ms. Nyimas Ida Apriani, Head of Environmental Degradation Control Division, Environmental Agency, Palembang City*

Palembang City had a population of 1,665,681 in 2009. The total land area of the city is 400.61 sq. km and is divided into 16 districts and 103 sub-districts for administrative functions. The city showed a high economic growth rate of 8.24% in 2010. The total waste generation in the city is about 100 tons per day and 79% is residential waste. According to the waste composition in the city, 47% of the waste is organic. About 66% of the total waste

generated is treated by the city and of this, 8% is recycled, including composting. Ms. Apriani explained the new SWM paradigm in the city based on the ECO CITY concept and key points are summarised as follows:

- The city has developed a new SWM strategy based on the ECO CITY concept.
- To achieve the city's aim of becoming an ECO CITY, Palembang has introduced four programmes, such as eco-friendly villages, eco-friendly offices, eco-friendly schools and eco-friendly markets.
- The eco-friendly village programme aims to decrease waste at the household level and awarded the best practices of households, through which the city has promoted the efforts of local residents.
- The eco-friendly school programme aims to develop environmental education and reduce waste generation at school through the introduction of 3R programmes.
- The eco-friendly office programme focuses on introducing waste management and 3R systems at offices.
- The eco-friendly market programme was introduced to reduce the waste generated at city markets.
- The mayor himself has made a commitment to these programmes.
- The city is working in partnership with the private sector to produce compost from the PT.Pusari area and the traditional market in the city.
- The main challenge is the lack of an integrated SWM system. The municipality has been facing budget shortages and human resource limitations in SWM. The city has also faced difficulties in raising public awareness. Since some residents think that the municipality takes full responsibility for environmental management, it is difficult to change public behaviour. There is also a lack of social environmental responsibility by many local companies.

2.2.4. Semarang, Indonesia

➤ *Mr. Berkah Wahyudi, Environmental Board, Semarang City*

Semarang City had a population of 1,555,984 in 2010. The city generates about 700 tons of waste per day and 62% is organic. Mr. Berkah presented the SWM in the city, with the following key points:

- The city has the large area for landfills and the recycling rate is only 9%.
- There are many insects swarming around untreated waste, which has caused sanitary issues. Unauthorised cows roam freely around the landfill site.
- The KitaQ System Composting has been promoted in some neighbourhoods after proper training has been carried out for households. Composting baskets have been distributed free of charge to the households who have received training.
- The importance of waste separation, collection and composting has been officially recognised by the city authority under the leadership of the mayor.

2.2.5. Tarakan, Indonesia

➤ *Ms. Sonya Wijayanti, Cleansing Department, Tarakan City*

Tarakan City had a total population of 230,093 people in 2010. The area of the city is 657 sq. km and total waste generation is about 577 tons per day. The waste collection coverage of the city is about 87%, and 54% of this waste is generated in residential areas. According to the

waste composition, 52% of waste is comprised of organic materials. Ms. Sonya explained the SWM and composting programmes in Tarakan City and key points of her presentation are as follows:

- The disposal system for solid waste has changed since 2005.
- The municipality has established the 3SR (Sorting, Reuse, Reduce, and Recycle) system.
- The city is aiming at 10% waste reduction in the city by 2014, increasing the coverage of waste management services.
- Since 2007, the municipality has been promoting composting programmes at household, community-based and market facilities.
- There are three types of composting methods are applied by Tarakan City, including the Takakura Home Method, Windrow and Barrel Composter.
- The city has taken initiatives to build partnerships with different stakeholders, such as schools, the private sector, community groups, and the media to implement composting programmes.
- The final products are used for city gardens, purchased by private companies, and sold to markets.
- The success of composting programmes is dependent upon the involvement of all stakeholders. The main barrier is finding good markets for the final product.

2.2.6. Cebu, Philippines

- *Mr. Pacres Jose Rey, Officer-in-charge, Cebu City Environment and Natural Resources Office, Cebu City*

Cebu City is the second largest in the Philippines, next to Manila and has a total land area of 326.10 sq. km. As of the 2000 census, the total population of Cebu City was 718,821 people in 137,864 households. The total waste generated in the city is about 411 tons per day and organic waste is about 50%. Mr. Rey presented the SWM strategy of the city and the progress in promoting pilot compost programmes.

- SWM is one of the key environmental issues in the city.
- The municipality has set up relevant legal and institutional frameworks for SWM and aimed to reduce half of its waste to be disposed within next three years.
- To achieve its objectives, new initiatives and actions are being taken to build partnerships with relevant stakeholders, such as City Academic Network, the business and industry sector, religious sector, and international organisations.
- The city started its composting programme in 2004 with the City Agriculture Department and took initiatives to establish a vermin-composting programme in one community. The programme became a showcase project in the applicability of the technology, but was not scaled up for wider practice.
- In 2007, the KitaQ System Composting was introduced to Cebu City under the Kitakyushu Initiative for Clean Environment implemented by Kitakyushu City and IGES. Through a wider network of the urban poor, academia, parishes and businesses, the city aimed to introduce the KitaQ System Composting for half of its city population. In addition to that, composting centres will be introduced for markets and other larger organic waste producers.
- The compost product will be purchased by the city government for its greening programme and support for farmers in upland agricultural areas. For this, the city has

already allocated PHP 2.5 million, but the mechanism for the purchase has yet to be established.

- The success factors for community-based composting programmes are political support, public participation, and technical know-how.
- The main challenges are inadequate information concerning solid waste management, shortage of human resources, and budget constraints.

2.2.7. Kampar, Malaysia

➤ *Mr. Goh Seng Chee, Assistant Environmental Health Officer, Kampar District Council*

The total population in the Kampar District Council area was 101,183 people in 2010. Estimated total waste generation is 117 tons per day and waste collection coverage is 67%. According to the waste composition, 39% of waste is food waste and 60% of waste is generated by households. Mr. Goh presented the SWM strategy of Kampar District Council and its efforts to promote composting at the community level.

- According to the new SWM strategy of Kampar, the city aims to decrease landfills by 22% by 2020. It was developed under a JICA supported project with an original completion date in 2010, but the city has decided to try to complete this initiative by 2020 by promoting public awareness and establishing an effective recycling system to minimise the amount of waste.
- Currently, the recycling rate in Kampar is about 13% of total waste generated. Thirteen model schools, two community initiatives, 20 trainers, recycling network units in district offices, and an information network have already been established.
- The city has been promoting participation of communities, NGOs, and universities with international cooperation, such as JOCV.
- The composting programme started in 2010 and the Takakura baskets were distributed to 86 households on a trial basis. However, the programme identified some barriers such as a lack of knowledge, attitudes and skills, market for final products, low market value for compost, and the sensitive characteristics of compost content, especially for *halal* food or *haram* religious periods.
- The success factors for composting are waste segregation at source, pure organic materials, larger quantities, good quality and market value.

2.2.8. Sibiu, Malaysia

➤ *Mr. Yong Ing Chu, Assistant Secretary, Sibiu City*

Sibu City is located in central Sarawak. The area under the jurisdiction of Sibiu City is 129.5 sq. km with a population of 162,348 people in 2010. The key points of Mr. Yong's presentation are as follows:

- According to the waste composition, 49% of the waste generated is organic and can be used for composting.
- The community composting programme started in 2008, with pilot projects in two residential neighbourhoods and two secondary schools. Activities are mainly focused on awareness raising, demonstration projects, free compost bin distribution and follow-up inspection. Further, a community-based composting centre was established for market waste.
- With regard to community composting, JICA has assisted with solid waste

management projects in Sibuh municipality under the JICA Partnership Program.

- The KitaQ System Composting was introduced to the city in 2009 and 288 baskets have been distributed thus far. In order to promote this initiative, the municipality has enhanced monitoring and follow-up.
- Despite the efforts to promote composting, the scale is small in comparison with Surabaya.
- The municipality has been facing technical issues to ensure the sustainability of the composting initiative. The city has been trying to equip its residents with the appropriate knowledge and skills to encourage them to continue composting even if they have difficulties.

2.2.9. Nonthaburi, Thailand

- *Ms. Pornsri Kicham, Municipal Secretary, Nonthaburi City*

Nonthaburi City has an area of 38.9 sq. km and a population of 263,553 people (106,074 households) in 2010. Ms. Pornsri explained the environmental management and composting programmes in the city. Key points follow:

- Nonthaburi was one of the first cities to join the Kitakyushu Initiative Network in 2001.
- In 2002, the city started a pilot project on waste reduction through the promotion of waste separation and recycling with support from UNESCAP and IGES. As a result, the city has succeeded in achieving a 37% waste reduction within one year.
- Since then, the city has taken initiatives to implement one project per year with assistance from different agencies, such as the construction of a composting plant in 2002, implementation of infectious waste management in 2004, GPS vehicle monitoring system in 2005, night soil (human faeces) management in 2006, hazardous waste management in 2007, the establishment of a wastewater treatment plant at the municipal office in 2009, and PSP & EPS foam separation and solar cell in 2011.
- The only composting plant in Nonthaburi started operations in 2002 by applying Italian technologies with financial assistance from the Asia Urbs Programme. The capacity of the compost plant is five tons per day and uses market waste. The technology is called Entsorga Technology.
- KitaQ System Composting recently began operations in 2011, and faces difficulties in dissemination. This is one of the biggest reasons that Nonthaburi participated in the seminar.
- The municipality has realized that policy, small scale, simple techniques, team work and motivation are keys to success of the community-based composting programmes.

2.3. A Successful Application of KitaQ System Composting in Surabaya

In this session, participants had an opportunity to acquire both theoretical and practical knowledge on KitaQ System Composting and its evolution in Surabaya City. Further, participants visited one of the organic farming sites located in Wakamatsu (near J-POWER group/JPec) to get firsthand experience in utilising compost for organic farming in Japan.

2.3.1. How to Make Takakura Compost and Solve the Practical Problems when Using Compost

- *Mr. Koji Takakura, Deputy Director, Wakamatsu Environment Research Institute, J-*

POWER group/JPec

- *Ms. Sayaka Yaoya, Wakamatsu Environment Research Institute, J-POWER group/JPec*

Mr. Takakura and Ms. Yaoya explained to the participants about the basic methods of using the Takakura composting system and elaborated on how to solve the practical problems that emerge during the implementation of composting schemes. Key points from their presentation are as follows:

- Microorganisms, moisture control, and aerobic conditions are important elements for Takakura composting.
- Various microorganisms are used during the composting process. It cannot be finished using only one kind of microorganism. The priority of the microorganism changes according to the stage of composting. The most important point to remember is not to expect the natural proliferation of the microorganisms, but to adjust accordingly.
- Composting has three stages of transition.
- In the first stage, easily decomposable organic matters are quickly decomposed with useful microorganisms. Both good and bad microorganisms can be used in the easily decomposable organic materials. The large amounts of harmless moulds and bacillus in the compost should be increased by adding fermented food such as *Aspergillus oryzae* and lactic acid bacteria. This is important to prevent rot.
- In the second stage, the majority of a botanical organism, such as the vegetables, is fibered. To deal with this situation, actinomycetes are suitable for decomposition of cellulose and the hemi cellulose. *Actinomycettes* live in the hums.
- In the third stage, decomposition of the lignin contained in the plant, such as the vegetables, is slow. The basidiomycete, a mushroom, is suitable for resolution of lignin.
- Fermentation microorganisms and bacterium can be found in the region. Microorganisms that are related to the fermented food are effective. When the fermented food is unavailable, decomposed fallen leaves (hums) are very effective. It is not only effective for the composting, but also collecting microorganisms from the local area are good for matching the soil in the respective area.
- Aerobic decomposition is effective for composting and is quicker than anaerobic decomposition.
- Effective moisture conditions for composting are 40-60%. Microorganisms perform poorly when moisture is low. However, when moisture is too high, the microorganisms become oxygen-deficient and result in anaerobic decomposition and rot.
- The best C/N ratio of compost is 20.

2.3.2. Successful Implication of KitaQ System Composting in Municipal Solid Waste Management in Surabaya City

- *Ms. Ema Agustina, Department of Public Works and Spatial Planning, Surabaya, Indonesia*

Surabaya City, the second largest city in Indonesia, next to Jakarta, had a population of two million in 2010. It is the centre of development in East Indonesia and can be divided into 31 districts and 160 sub-districts for administrative purposes. As many other cities in developing Asia, Surabaya City faced tremendous challenges in managing solid waste. The total waste

has increased with population growth, economic development, urbanisation and new lifestyles. As a result, the city authority took initiatives to implement the new SWM strategy which is focused on reducing waste at its source and processing waste in the landfill by using environmentally friendly technologies. Ms. Ema explained how Surabaya has succeeded in reducing its waste generation by 30% especially through the introduction of community-based solid waste management and composting. In addition to her presentation, she used a short video to explain Surabaya's efforts in SWM and composting. Key points from her presentation are as follows:

- The municipality has been promoting community-based waste management programmes with community involvement in its management through 3R implementation. The basic concept of these community-based programmes is reducing waste at source, waste sorting (organic and non-organic waste) and proper waste treatment, such as organic waste processed into compost, recycling waste sold to scavengers or used to make recycled products. The remainder is sent to a sanitary landfill.
- The implementation structure of the community-based solid waste management programme is socialization to the community (city authority in partnership with NGOs), recruitment and training of cadres, distribution of cleaning tools (composter bin, Takakura composting baskets, cart, and establishing composting centres), involving communities, processing organic waste into compost, selling recyclable materials to scavengers or used for recycled products.
- Since 2002, the municipal authority distributed about 20,000 compost baskets to households and established 16 composting centres throughout the city.
- Further, the municipal authority took the initiative to motivate communities to create community-based SWM programmes by giving incentives to those communities that are willing to become involved (Green and Clean Campaign), as well as incentives to environmental carders through the national day award system in recognition of their service. At the same time, the city strictly enforced the laws and regulations for those that do not obey the rules.
- Surabaya's achievement in reducing waste generation is highly recognised at the international level. The city has received nine international awards so far.
- However, the municipality is still facing some issues, such as low awareness of waste disposal, generation of waste by hawkers and markets, increase of product waste, which cannot be reused, reduced, and recycled, and little knowledge on simple waste technology, which can create products with economic value.

2.3.3. Observation of Community Composting and Organic Farming

➤ *Ms. Sanae Yoshihara, Yoshihara Farm*

At the end of the session, participants visited Yoshihara Farm, an organic farm in Wakamatsu, Kitakyushu City and observed how compost was produced and how it is utilised in organic farming. Through communication with Ms. Yoshihara, owner of the farm, the participants explored the challenges and constraints in promoting composting and organic farming. Ms. Yoshihara explained that three important points need to be considered for organic farming:

- Organic farming is not only farming without using pesticides and fertilisers, it is 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.

Thursday, 30 June

2.4. Experiences in Establishing a Sustainable Material-Cycle Society in Kitakyushu City

This session was devoted to give participants some ideas about the national policy framework for the establishment of a Sound Material-Cycle Society in Japan and shared the experiences of Japanese cities in implementing this aim in collaboration with different stakeholders. Kitakyushu City shared its experiences in building an internationally recognised, environmentally leading city through the establishment of a sustainable material-cycle society. Following this, IGES made a presentation on the success of Surabaya case from an academic perspective and its replication in other Asian cities under the Kitakyushu Initiative. Further, IGES shared the findings of its recent study on the best practices of Japan in municipal solid waste and the 3Rs approach and announced its new initiative in establishing the environmental model cities programme in Asia with the Secretariat of ASEAN.

2.4.1. International Environmental Cooperation Strategies and Municipal Solid Waste Management in Kitakyushu City

- *Ms. Seiko Kubo, Deputy Director, Office for International Environmental Strategies, Kitakyushu City*

Kitakyushu City has a long history of tackling and recovering from environmental pollution. The city has been recognised as an environmental model city in and outside the country and has been exporting its environmental technologies and knowledge to many Asian countries. Ms. Kubo explained to the participants about the city's environmental strategies, highlighted its experiences in building a Sound Material-Cycle Society based on the national policy framework and discussed the city's waste administration, basic plan for SWM, waste separation and collection, promotion of eco-town for waste recycling and final treatment methods including the new initiative to promote composting for kitchen waste at the household level. Key points from her presentation are as follows:

Municipal Waste Management

- According to the Waste Disposal and Public Cleansing Law, waste refers to refuse, bulky refuse, ashes, sludge, excreta, waste oil, waste acid and alkali, carcasses and other filthy and unnecessary matter in solid or liquid state.
- Municipal wastes have been treated by the local government, while industrial waste is treated by businesses directly.
- The legal framework has been strategically set up to establish a recycling-based society and the role assignment between parties is clearly demarcated.
- The Extended Producer Responsibility aims to control the generation of waste by holding producers responsible not only for the production and delivery of products, but also for the disposal of the products after use.
- The development of strategies for waste treatment in Kitakyushu City can be divided into three stage: Stage 1—Disposal oriented process (before 1993), Stage 2—Recycling-oriented process (1993-2000) and Stage 3—Environmentally-sound process

(after 2000).

- The basic plan of municipal waste treatment in Kitakyushu City was formulated in 2001 and aimed to increase in the recycling rate from 13% to 25% within 10 years.
- To achieve this target, the city developed a basic view on the sorting and recycling of wastes, such as raising awareness and understanding of residents, establishment of recycling technology, demand for recycled products, and efficiency including cost performance.
- Local efforts for recycling domestic garbage were further encouraged by subsidising collection by local volunteer organisations and promoting household composting.

Green Growth Strategies

- The Kitakyushu Green Frontier Plan includes the city's strategy for the establishment of a low carbon economy. According to the plan, the city aims to establish a sustainable society with prosperity to be shared through generations by reducing CO₂ to protect the environment, achieve happiness, health, a comfortable and convenient life while also simultaneously pursuing the achievement of sustainable economic development. The city further aimed to achieve a CO₂ reduction target of 40% of economic growth in 2050, including 50% within the city and 150% in Asia.
- Kitakyushu's five development strategies for sustainable development are urban development, industrial development, human development, social development and sustainable development in Asia.
- To achieve a low carbon economy, the smart usage of industrial potential energy has been encouraged. As a part of this initiative, the Zero Carbon Emission Town Development (Jono Area) has been formulated.
- The Kitakyushu Eco Premium and Eco-Town has been established to facilitate resource circulation and eco-industries.
- Kitakyushu has been involved in developing win-win relationships in Asia through environmental cooperation to mitigate environmental pollution and realise the creation of a low carbon economy.
- The Asian Partnership Programme towards shared prosperity has trained 6,207 participants from 138 countries and dispatched 160 experts to promote environmental projects in Asia.
- The Kitakyushu Initiative, a city-to-city environmental cooperation network of the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), was established to share good practices in urban environmental management.
- The Kitakyushu Asian Centre for Low Carbon Society was established in 2010 aiming to promote carbon reduction and vitalise economies in Asia.
- Kitakyushu's low carbon technologies are transferred to realise the creation of a low carbon economy in Asia.

2.4.2. Kitakyushu Initiative and Replication of Surabaya Composting Model in Other Asian Cities

➤ *Mr. Toshizo Maeda, Acting Director, IGES Kitakyushu Urban Centre*

The Kitakyushu Initiative is a programme of ESCAP, which was adopted at the 4th Ministerial Conference on Environment and Development in Asia and the Pacific (MCED4) held in Kitakyushu City, Japan. Its main objective is to improve the urban environment and

human health by promoting environmental actions at the local level. IGES Kitakyushu Urban Centre served as the Secretariat of the Kitakyushu Initiative Network during its implementation and facilitated the replication of good practices as well as capacity-building programmes for integrated urban environmental management in Asia. The replication of Surabaya's community-based solid waste management and composting model in many other cities utilising city-to-city cooperation and inter-city networks was a successful dissemination of good practices under the Kitakyushu Initiative in Asia. Mr. Maeda briefly presented the experiences of the Kitakyushu Initiative and replication of the Surabaya composting model in other Asian cities. Key points from the presentation:

- Summarising the presentations made by the participant cities in the first day, Mr. Maeda emphasised that the total amount of wastes in all participating cities has continued to increase due to the economic growth. This shows that immediate attention is required to develop strategies for waste reduction in these cities.
- Surabaya, the second largest city in Indonesia has already proven that it can achieve substantial waste reduction (20% within four years and 30% in five years) by promoting composting at household and community levels. It was evident that one ton of composting can be reduced to an additional 1-2 tons of dry waste through the reuse and recycling of waste.
- This results in not only waste reduction, but also social and environmental benefits, such as better household environments, greener and cleaner streets, environmental education, employment opportunities, promotion of recycling, production of herbs and vegetables and income from the sales of compost products.
- It was important to build partnerships among different stakeholders for the successful implementation of the composting programmes. Surabaya's model compost project started from one community. It was then scaled up by the city government with the establishment of composting centres and distribution of compost baskets. The programme was further replicated by organising community clean-up campaigns in cooperation with NGOs, the private sector and the media.
- Selecting a suitable composting method was another successful factor of the Surabaya model. KitaQ System Composting is low-cost, low-tech, easy to operate, uses only local materials, has no offensive smell, no leachate, is fast, requires less space required and results in good quality compost.
- Financial analysis of composting in Surabaya has shown that promotion of composting and waste segregation required only 1-2% of the total SWM cost of the city and a reduction of USD 48,000 can be achieved per year by reducing waste.
- Based on the experiences of Surabaya City, Sibuh City derived some recommendations for its aim to reduce waste generation by 10% to 20% in a period of three years. These recommendations included the construction of a market waste composting centre (processes two tons per day), four community composting centres (processes two tons per day), distribution of compost baskets to 1,000 households, organisation of a clean-up campaign, establishment of compost purchasing scheme and technical assistance from KITA, Kitakyushu City, IGES and JICA.
- The support from the national and local governments are important, especially at the initial stage of SWM, and the roles of inter-mediators, such as NGOs and community groups, are essential for replicating and scaling up good practices. Replication from city-to-city can be facilitated by external agencies.

2.4.3. Best Practices of Japan: Municipal Solid Waste and the 3R Approach

➤ *Dr. D.G.J.Premakumara, Policy Researcher, IGES, Kitakyushu Urban Centre*

Japan had moved towards the principle of sustainable development as the basis of its society and to establish the Sound Material-Cycle Society in 2000. This law aims to promote sustainable societies where the consumption of natural resources and environmental loads are minimised through shared responsibility among authorities, businesses and residents. It calls for preventing waste generation (reduce), promoting the cyclical use of products (reuse, recycling) and ensuring proper waste disposal. The Ministry of Environment Japan (MOEJ) formulated the fundamental plan for establishing a Sound Material-Cycle Society (2003, 2008), which outlined the practical steps that should be taken to reach the goal of becoming a Sound Material-Cycle Society.

Under the above legislative foundation provided by the central government, local governments in Japan have enacted measures to achieve targets through the cooperation of different stakeholders, especially through the encouragement of community participation. Dr. Premakumara presented the key findings of some case studies that focused on the efforts being taken across Japan to establish a more resource efficient society, including both large cities (Yokohama, Nagoya, Kitakyushu) and small cities (Minamata, Oki Town). It gave the participants some idea about the implementation processes, innovative actions and major achievements in each case study city. A key message was that a 20%-40% waste reduction was achieved by each city promoting waste separation, collection and recycling with its residents. This requires:

- strong leadership and commitment of the local government (both political and responsible agencies),
- a joint vision generated through active involvement of key stakeholders, including local authority, civil society, business sector (formal and informal) and academics,
- establishing a clear definition and classification rules and proper sorting, collection and treatment mechanism based on local conditions,
- increasing public awareness on new waste separation and collection systems,
- promoting partnership among different stakeholders in the city, while facilitating their own innovative activities,
- establishing recycling stations to convert the waste into resources after they are collected, and
- no high-end inputs, but only continuous communication and enabling environment.

2.5. Capacity Development in Solid Waste Management with Special Reference to the Introduction of KitaQ System Composting

➤ *Overall facilitator: Dr. Yoshida Mitsuo, Senior Advisor (Environment), JICA*

➤ *Reporter: Dr. D.G.J.Premakumara, Policy Researcher, IGES*

Surabaya's achievement exemplifies the reduction of a large amount of waste in a short period of time with a limited budget by establishing an Integrated Sustainable Waste Management System, which is based in institutional, social, environmental, political, technical and financial aspects. It also emphasises the critical role of involving various stakeholders, covering waste prevention and resource recovery, including interactions with other urban systems and promoting and integrating different habitat scales from household,

neighbourhood to city. It was not only a technical matter in introducing the KitaQ System Composting. This requires providing support for capacity development of the beneficiary city, instead of simple technical transfer.

2.5.1. Introductory Session and Visioning Exercise

➤ *Dr. Yoshida Mitsuo, Senior Advisor (Environment), JICA*

Dr. Yoshida gave an introductory lecture on capacity development in solid waste management with special reference to the KitaQ System Composting. His presentation included the following topics, including the reasons why capacity is required for solid waste management and composting, the concept of capacity development, different levels in capacity development and components of capacity at each of these levels. He emphasised that the quality of waste collection/transportation service and final disposal is enhanced in line with economic growth in cities. However, the SWM service qualities are widely diversified even in the same level of economic growth. Economic growth is not only a factor for qualified SWM. Many other factors including capacity development must be considered. He then briefly explained the flowchart of composting in solid waste management and necessary factors for capacity development at each level including waste generation, collection transportation, composting processes and product utilisation. Further, he explained the comprehensive feature of capacity development in the organisational aspect for composting and the enabling environment that is required.

2.5.2. Discussion Session 1: Identify the Necessary Capacities for Promotion of Composting in Municipal Solid Waste Management

After the introductory presentation of Dr. Yoshida, participants were broken into four discussion groups, including organisation/institution for composting, community-based approach, marketing of compost and financial sustainability and public awareness. These groups were divided based on the successful factors and key challenges identified by the participants in their city presentations in the first day of the seminar. Participants were then asked to choose a group on their own considering the situation and most relevance for their cities. The three participants came from Balikpapan City were requested to join with three different groups to provide more variation within the discussions. Participants from the host country were able to select the group of their choosing.

The participants were then asked to select a group leader to present the group findings voluntarily in the presentation session at the end of the day. Each group was given a summary sheet of key points identified under the each theme from the city presentations and asked them to consider these points during their discussions. Within each group, participants debated and identified the necessary capacities required at different levels and promoting/inhibiting factors to achieve them. Each group has a group facilitator to make the discussion more effective by creating interaction and exchange between the group members. The breakout groups had the following composition:

	Group 1: Organisation/institution for composting	Group2: Community- based approach	Group 3: Marketing/financial sustainability	Group 4: Public awareness
<i>Group Leader</i>	Cebu	Sibu	Balikpapan	Nonthaburi
<i>Group Member</i>	Balikpapan	Kampar Palembang Balikpapan IGES	Makassar Semarang IGES	Surabaya Tarakan
<i>Group Facilitator</i>	Mr. Maeda Toshizou, IGES	Ms. Tamura Eriko, JICA	Mr. Yao Kazuya, JICA	Ms. Murakami Emiko, IGES

2.5.3. Introduction of Citizen Participation in Promoting 3R Activities and Observation of Community Composting Programme in Ano Community Centre

➤ *Ms. Nobuko Uchiyama, Manager, Ano Community Centre*

Drawing upon the lessons learned by the Great Hanshin-Awaji Earthquake in 1995, Kitakyushu City has taken actions to establish the number of community halls (social education facilities) in primary school districts and renamed them as community centres which serve as a place for voluntary activities of the respective community. Ms. Uchiyama explained about public participation in promoting 3R activities at Ano Community Centre. In addition, the participants had a chance to attend the practical observation in a Training of Trainers programme in the community centre to promote composting at the household level. Key points from Ms. Uchiyama's presentation are as follows:

- Ano Community Centre was established with subsidies from Kitakyushu city to support social welfare for the local community and encourage the voluntarily activities of the residents.
- The centre has been involved in a wide range of activities, such as community actions, continuing education, welfare, eco-friendly recycling, youth development, child-raising support, health care and fitness, disaster and crime prevention.
- The Ano community centre is one of the most active community centres in the city in promoting recycling activities. Nine categories of resource materials are covered all year around. In addition, a recycling bazaar for second-hand books, daily utensils and clothes is organised in summer holidays and cultural festivals.
- The community centre has set up an environmental working group and has been organising composting seminars since January 2011 aiming to minimise kitchen waste and produce good quality compost for the soil of vegetable gardens.
- It was focused on promoting activities that can be involved by all sections of the society, such as children, adult and elderly people.

2.5.4. Group Presentation: Identify the Necessary Capacities for Promotion of Composting in Municipal Solid Waste Management

After participants returned from Ano Community Centre, they further engaged in group discussions and then returned to the plenary session to share the results of their discussions. The group leaders presented their discussion outputs. Others were given an opportunity to add or make any comments after the each presentation. These were considered in putting together the final list as below:

Group 1 – Organisation/institution for composting

➤ *Group Presenter: Mr. Pacres Jose Rey, Cebu City*

<i>Promotion Factors</i>		<i>Inhabiting Factors (Obstacles)</i>	
Strong support from the Mayor Available knowledge and experience of composting in the city Existing SWM programmes in the schools Existing network with other stakeholders, such as academic, civil society, business sector and international agencies Existing SWM laws and ordinances Trained staff available for composting promotion		Weak support from other departments Limited budget and financial resources Inadequate personal staff and equipment Lack of incentives and enforcements	
<i>Capacity Level</i>		<i>Description of Capacities</i>	
Individual		Better communication skills for leaders Improve motivation and moral of staff Education and skill development programmes for staff in each level	
Organisational		Develop briefing materials about SWM Measures for additional funding Sufficient staff and equipment Reward system within the organisation Education of staff management	
Institutional & Societal		Network between decision makers and other staff Public awareness campaign Coordination among different departments New regulations, laws and by-laws for introducing waste separation, collection and composting Strong enforcement of existing laws Reward system	

Group 2 – Community-based initiatives

➤ **Group Presenter: Mr. Yong Ing Chu, Sibü City**

Promotion Factors	Inhabiting Factors (Obstacles)
Existing community-based composting centers Available partnership with other stakeholders Strong community leaders Existing community-based organisations and social capital Existing networks with international agencies, like JICA Environmental awareness among residents	Low education among community members Low-priority of SWM for residents Misconception that SWM is the responsibility of the local authority Lack of law enforcement Lack of human resources Weak network among people within the community as well as outside community Lack of budget allocation for community-based initiatives No incentives Lack of commitments by both residents and authorities Cultural differences Political influence at community level Lack of awareness
Capacity Level	Description of Capacities
Individual	Motivation for cadres Training courses, seminars on SWM Communication skills
Organisational	Integrated SWM system Coordination between stakeholders Gender participation Waste bank programme Community centres and community-based organisations Strong leadership at community level Clear role and responsibilities for community leaders 3R programmes at community level Training on composting methods Strengthened networks
Institutional & Societal	Local regulations Incentives and enforcements Private sector partnership and CSR Technical guidelines Strong political will Integrated environmental management programmes Policy and guidelines External funding from donors Partnership with different stakeholders

Group 3 – Marketing and economic sustainability

➤ **Group Presenter: Mr. Arie Soetjadi, Balikpapan City**

Promotion Factors	Inhabiting Factors (Obstacles)
Promotion campaign National standards for composting are set Cost-benefits analysis	Less demand Subsidy provided for chemical fertiliser Lack of regulation No agricultural functions in the city
Capacity Level	Description of Capacities
Individual	Knowledge and coordination skills of cadres Cost-benefit analysis skills of head of official Fostering knowledge of facilitation to strengthen linkages with communities
Organizational	Advertising and marketing by involving other stakeholders
Institutional & Societal	Standard procedure Strengthening collaboration between different stakeholders, especially with private sector ventures Raise awareness for CSR Political will and support

Group 4 – Public Awareness

➤ **Group Presenter: Ms. Pornsri Kicham, Nonthaburi City**

Promotion Factors	Inhabiting Factors (Obstacles)
Existing public awareness campaigns Organizes seminars for socialisation Good education Demonstration Participation of stakeholders Good cooperation Incentives Competition Reward and punishment system are available Documentation and sharing of best practices	Culture differences to achieve consensus People mindset Lack of responsibility Lack of supportive policies, regulations and laws Economic disparities
Capacity Level	Description of Capacities
Individual	Knowledge, attitude, individual skills Accumulate experiences
Organizational	Seminars planning and implementation Infrastructure (building) Technology Database/information Build networking
Institutional & Societal	Local regulations, environmental permit and laws Education programme for residents through media Educate local leaders to guide small groups for one direction

Friday 01 July

2.5.5. Site Visit to Bin/Can Recycling Centre in Honjo

There are two facilities in the Kitakyushu City for can and glass bottle recycling, where waste is separated into cans, glass bottles, plastic bottles, paper containers (milk cartons) and plastic trays for sale. In the morning of Day 3, the participants visited Honjo recycling centre and observed its functions. This centre was built for two objectives with subsidies from Kitakyushu City: the promotion of recycling and to guarantee jobs for handicapped people (fifteen handicapped workers are employed at the centre). The separated waste is sent to Eco-Town for recycling.

2.5.6. Discussion Session 2: Identify Strategic Actions for Composting Model Cities in Asia

Participants were once again divided into four groups to discuss the actions needed to achieve the strategies identified in the previous session. The group composition was primarily the same as the previous session. Dr. Premakumara then presented the draft actions, which was identified by him after a brainstorming session with Dr. Yoshida and key members of the coordination committee, including JICA, IGES, Kitakyushu City, KITA and Mr. Yao from JICA, and was also based on the group findings of the previous session. Following this, there were discussions within each group about the list and each group was asked to share their ideas or comments. There were further discussions before finalising the list of actions and other groups are also provided opportunity for additional points. At the end of the session, the following list of actions were identified as the strategic actions to overcome the key challenges cities are facing in implementing community-based composting programmes in Asia.

Group 1: Marketing

Challenges/Issues

- Insufficient market demand for composting
- Scepticism and lack of awareness on organic fertiliser
- Competition from chemical fertilisers
- Far distance to market (farmers)
- Poor quality

Suggested Solutions/Actions

Create and sustain a market for compost

- Develop an appropriate marketing strategy
- Prepare a demand map and business plan based on production capacity
- Set-up demonstration projects and offer free samples
- Integrated with existing markets and distribution networks
- Use of compost by local government for its city greening and parks
- Promote new life-styles on organic farming
- Offer support to composters conceptually and financially that is accessible, applicable and consistent

- Shift subsidies towards organic fertiliser
- Use compost for soil rehabilitation
- MoU among local authorities

Ensure quality control

- Separate waste at source as much as possible
- Collect and contain industrial waste stream separately from street sweeping waste, market waste and household waste
- Introduce and support waste segregation at the household level into organic and non-organic
- Develop national/local standards for compost
- Establish national/local certification system for compost
- Carry-out research and development on compost quality in cooperation with academic and research institutes
- Design and implement training programmes on compost quality control

Regulation

- Enforcement for officers to buy compost
- Spatial planning (e.g. building parks)
- Eliminate subsidy for chemical fertiliser and shift to compost

Group 2: Public Awareness

Challenges/Issues

- Community lacks commitments
- Lack of awareness, understanding and enthusiasm

Suggested Solutions/Actions

Generate awareness, understanding and enthusiasm

- Design and implementation of information, education and communication programmes with assistance of CBOs, NGOs and others
- Explain and promote the economic, social and environmental benefits of community composting schemes
- Select appropriate organisational approaches for composting schemes based on the level of community capacity
- Integrate all stakeholders into planning, design and implementation and marketing of a composting programme
- Establish an award system to motivate public participation for community composting activities
- Establish partnerships with the private sector, mass media, and academic institutions in designing and implementing socialisation programmes and award systems
- Create community rules and law enforcement for ones who not obey the schemes
- Social punishment for non-cooperative body

Group 3: Design of Community-based Composting Schemes

Challenges/Issues

- Insufficient knowledge and technical expertise
- Trepidation prevents those yet to acquire the necessary skills from initiating compost schemes.
- Those with limited knowledge produce low-quality compost that is less marketable and could be contaminated.
- Lack of seed capitals for infrastructure development (land cost, building cost, and other equipment necessary)
- Cost for operational and maintenance

Suggested Solutions/Actions

Selection of appropriate approach

- Appropriate composting approach (household basket/backyard composting or community composting centre) and appropriate composting method (Takakura, Windrow, box or in-vessel) need to be selected taking into account technical, financial, socio-cultural and institutional capacity.
- Select appropriate sites for community composting centres
- Support of community leader (opinion leader)

Development and design of collection system

- Assess the target community interest and land availability for construction of community composting centres
- Collect possible data on the solid waste generation in the community, its composition and existing conditions of the service
- Select the appropriate waste collection system
- Promote waste separation at household level
- Organise and introduce fee collection
- Integrated solid waste management strategy

Community participation and mobilisation for composting programme

- Creating networks between competent composters (public organisations, private entrepreneurs and NGOs) and those institutions and individuals eager to learn more can vastly improve the quality and quantity of compost production.

Operation and maintaining a composting programme

- Operation and monitoring
- Trouble shooting
- Control the quality

Group 4: Organisational/Institutional

Challenges/Issues

- Lack of appropriate legal framework
- Lack of clear vision and strategic plans
- Lack of coordination among staff in the same department and also different departments and sections

- Lack of coordination between other stakeholders
- Existing procedures have limitations
- Lack of skills and capacities
- Political influence

Suggested Solutions/Actions

Developing strategic plans

- Collect baseline data
- Prepare an integrated plan showing clear vision with active participation of different stakeholders
- Establish appropriate legal framework
- Allocate sufficient budget
- Create coordinating system
- Invite different stakeholders to coordinating, monitoring committees
- Establish training programmes
- Create network with international agencies
- Facilities and equipment
- Intellectual asset
- Resource centre (e.g. data collection, information sharing)
- Commitment of the staff for implementation
- National policy and strategy to support compost promotion

2.5.7. Discussion Session 3 – Identify Follow-up Actions

- *Facilitator: Dr. Yoshida Mitsuo, Senior Advisor (Environment), JICA*
- *Reporter: Mr., Yao Kazuya, Associate Expert, Global Environmental Department, JICA*

Finally, participants were given an opportunity to identify and present some follow-up actions after their return based on the experiences gained through attending the seminar. They were advised not to list up long list of dreams of actions and asked to focus on more practical and easy to implement within their regular work responsibilities. Participants then came to plenary and shared the list of actions to work on. Further, key members of the organising committee also shared their views and possible opportunities for follow-up action. The lists of recommended actions are as follows:

Balikpapan

- Establish regulation for marketing compost
- Establish special mechanism for promoting composting in the municipal office
- Initiate collaboration with mining companies for marketing compost
- Consider the importance of promoting gardening and parks in spatial planning
- Campaign for the mayor to promote compost

Makassar

- Obtain support of the mayor to establish regulations for composting
- Establish composting centres in district and sub district
- Promote household composting
- Establish campaigns for the communities to promote

- Collaborate with private sector, university, NGO and schools

Palembang

- Continue on-going activities in the area of composting (environmental cadre in the community, eco-community)
- Strengthen staff capacity to support community-based programmes
- Initiative to collaborate, network and lobby with other stakeholders (private sector, farms, NGOs, etc.)

Semarang

- Establish compost centres in every sub-district
- Collaboration and getting strong commitment from every stakeholder for implementation
- Establish regulation to encourage participation of other stakeholders

Tarakan

- Improve commitment and effort on composting and community-based SWM (five community-based solid waste management projects)
- Promote waste separation at household level
- Socialization and promotion of composting at the community-level (especially schools, women groups, etc.)
- Develop compost quality standard for local government to promote use in farming
- Improve partnership with other stakeholders (media, academic bodies, etc.)

Cebu

- Publish manual of KitaQ System Composting and centralised windrow composting
- Prepare the next year budget for compost activities (500,000 pesos →double in 2011)
- Modification of 2011 budget for community-based composting

Kampar

- Establish compost centre in the market
- Replication of household composting to two new communities
- Implement training of trainers programme (university and school students)
- Networking and dissemination of information in 13 local authorities

Sibu

- Management of existing compost centre by collaborating with other stakeholders (e.g. private company)
- Replication of KitaQ System Composting in one more community
- Share experience with neighbouring cities

Nonthaburi

- Start a pilot project for KitaQ System Composting
- Prepare education, seminars, communities, budget, leaflets, schools, city-produced seed compost
- Take action to decrease the use of chemical fertiliser in the municipality (e.g. public parks)

Surabaya

- Moving towards integrated environmental planning (Not only waste management)
- Continue and improve community activities on composting
- Introduce more community compost centres (involvement of shopping centres)
- Encourage recycling business

Key members of the organising team shared the possible support that could be provided from their side. Mr. Takakura recommended that the best way to recycle kitchen waste is to make compost. It can rehabilitate degraded soil and has a lot of advantages for city authorities. However, the successful implementation of KitaQ System Composting requires initiatives by local authorities, collaboration with residents, private companies through Corporate Social Responsibility (CSR) and the development of human resources.

Mr. Mitoma from Kitakyushu City indicated that the city has already take actions to inform the people in Kitakyushu City about this seminar through mass media and hope to collaborate with participating cities not only to promote composting, but also in other SWM activities, such Eco-Town development.

Representing KITA, Mr. Nagaishi said it will take action to follow-up with Kitakyushu City and IGES. Ms. Morimoto from KITA also emphasised that environmental education for young people is a very effective tool to educate adults and that real, hands-on experience for children is very important (e.g. site visit for children to see environmental facilities).

Dr. Premakumara from IGES pointed that as a research institution, IGES would like to work closely with JICA, Kitakyushu City and KITA in the following actions, such as further studies on the success of the Surabaya case study and the development of training materials (manuals, video documentary, and case study series) to share this information and experience with other cities, assist cities in preparing integrated solid waste management plans based on composting and 3Rs, document and share the experiences of Japanese cities in promoting 3Rs, conduct policy dialogues to promote community-based composting in SWM, and design and implement training and capacity building programmes.

Ms. Tamura, JICA Kyushu, thanked the all participant cities for their commitment and active participation throughout the seminar. The seminar was very successful in identifying opportunities to share experiences and promote activities on composting. Further, JICA had a great opportunity to learn from the practical experiences of the cities, which will help in developing training/capacity building materials and new training programmes to support composting in SWM. She also indicated JICA's interest in continuing this type of seminars in the future.

2.6. Wrap-up and Closing Remarks

- *Mr. Keiichi Muraoka, Director General, JICA Kyushu*
- *Mr. Hideo Naito, Executive Director, Office for International Environmental Strategies, Environmental Bureau, Kitakyushu City*
- *Ms. Pornsri Kichtham, Municipal Secretary, Nonthaburi, Thailand*

The three-day seminar concluded with closing remarks from Mr. Keiichi Muraoka, Director General of JICA Kyushu. He thanked all participants and emphasised his great expectations

of the outcomes of the seminar. The information shared and lessons learned during last three days of the seminar will benefit the new initiatives of all participating cities. Specially, action plans formulated by respective cities will be effective in enforcing sustainable SWM. Strengthening the local administration in developing countries is one of the JICA missions and this seminar is one of themes.

Mr. Hideo Naito, Executive Director of Office for International Environmental Strategies, Environmental Bureau, Kitakyushu City extended his the gratitude to the participating cities for their attendance and active participation in the seminar. He spotlighted Kitakyushu's work on the composting project in Surabaya and other Asian cities with Mr. Takakura, J-POWER group/JPec, since 2002. KitaQ System Composting has great potential for replication, especially in Asian cities. Making adjustments with local conditions is the key to dissemination of KitaQ System Composting. Mr. Naito concluded his remarks saying that Kitakyushu City welcomes all contact and inquires from respective cities.

In response to the above remarks, Ms. Pornsri Kitcham, Municipal Secretary of Nonthaburi City in Thailand, expressed her appreciation to Kitakyushu City, JICA, IGES and all organisations on behalf of all the delegates for the organisation of the seminar. Further, she expressed her expectation that all participating cities would implement action plans making full use of the knowledge, skills, and lessons learned in this seminar and noted that there is a need for mechanisms to make many of the actions coming out from the seminar and group discussions a reality.