

## APPENDIX F

### SUMMARY OF THEMATIC SESSIONS A, B, C & D

#### **I) Thematic Session A: Urban Solid Waste Management**

The thematic session on urban solid waste management was chaired by Dr. Vann Monyneath, Deputy Director General for Technical Affairs, Ministry of Environment, Cambodia, and co-chaired by Mr. Naoki Mori, Deputy Director General, Global Environmental Division, JICA.

After the introduction and overview of the session by the session chair, city officials from both national and local governments from eight Asian countries (Phnom Penh, Cambodia; Vietnam; Luangprabang Lao PDR; Singapore; Yangon, Myanmar; Surabaya, Indonesia; Tirupati and Shimla, India; and Kitakyushu, Japan) and international agencies (UNEP-IETC) gave presentations on solid waste management practices, as follows:

1. *Urban Solid Waste Management Approach: Contributing to Waste Reduction by Using Appropriate Technology* by Mr. Chiek Ang, Director, Environment Department, Phnom Penh City, Cambodia;
2. *Improving Solid Waste Management for Environmentally Sustainable Cities in Viet Nam: Challenges and Opportunities* by Dr. Do Nam Thang, Deputy Director, Institute of Science for Environmental Management (ISEM), Vietnam Environment Administration - Ministry of Natural Resources and Environment, Vietnam;
3. *Public Campaign for Waste Collection and Minimisation of Luangprabang* by Mr. Sengdara Douangmyxay, Deputy Head of Division, Ministry of Public Works and Transport; Mr. Phoumy Ophetsane, Vice President, Urban Development, Administration, Authority of Luang Prabang, Lao PDR;
4. *Singapore's Integrated Solid Waste Management* by Mr. Teoh Soon Kay, Engineer, Waste and Resource Management Department, National Environment Agency, Singapore;
5. *Management of Solid Waste, Water and Sanitation Systems toward Environmentally Sustainable Yangon City* by Mr. Kyaw Thar Sein, Assistant Head of Department, Pollution Control & Cleansing Department, Yangon City Development Committee, Myanmar;
6. *Community-based Solid Waste Management as Best Practice in Surabaya City* by Tri Rismaharini, Mayor, Surabaya City, Indonesia;
7. *Solid Waste Management in Tirupati City* by Mr. Chandra Mouliswar Reddy, Deputy

- Municipal Commissioner, Tirupati, India;
8. *Solid Waste Management in Shimla City* by Mr. A. N. Sharma, Municipal Commissioner, Shimla, India;
  9. *Municipal Waste Management in Kitakyushu City* by Mr. Yoshinori Hamasaki, Manager, Resource Circulation Division, Resource Circulation Department, Environment Bureau, City of Kitakyushu;
  10. *Global Partnership on Waste Management* by Mr. Lee Chan Hee, Senior Programme Officer, UNEP-ROAP, on behalf of Ms. Ainhoa Carpintero Rogero, Associate Programme Officer, UNEP -IETC

Each presentation highlighted solid waste management as one of the most serious environmental challenges confronting urban areas both in terms of human health and the impacts on climate change. Thus, the importance of an integrated solid waste management approach was recognized. Based on the concept of resource efficiency and 3Rs, cities need to reduce the amount of waste from the source rather than at the end-of-pipe. For the successful implementation of the 3Rs programme, participation and collaboration among stakeholders, leadership from local governments, supportive national policy frameworks, and economic incentives and enforcement are essential.

## **Discussion**

### **1. Challenges in solid waste management for Asian cities**

Rapid urbanisation and growing urban solid waste generation are resulting in increasing spending on waste management by local governments in Asia. Inadequate collection (50-60% in Lao) and uncontrolled disposal of solid waste result in a serious health threat to citizens and the environment.

In terms of waste composition, the proportion of organic waste in most developing countries is high (over 50%), but the non-degradable waste fraction is also growing with the emergence of new consumption patterns.

The cities are becoming increasingly aware of the importance of an integrated approach based on 3R principles in order to reduce the pressure on urban solid waste management. The informal sector plays a significant role in the waste management and resource recovery in many urban cities in Asia, thus careful engagement and integration of the informal sector can be beneficial to secure source of livelihood and better working environment, which could lead to improving both human health and environment, eradicating poverty and achieving the MDGs (compost centers run by waste pickers in Phnom Penh, community waste

collection in Shimla).

## **2. Urban solid waste management and Low Carbon Development**

Waste treatment commonly consists in open dumping or open burning in many developing cities of Asia, which cause not only pollution but also negative impacts with regards to climate change. Thus, the promotion of composting and biogas generation can be considered as alternative strategies for reducing inappropriate organic waste disposal. Its contribution to the reduction in GHG emissions is also a cross-cutting element which is attracting the interest of many cities, as well as support from donor organizations.

## **3. The Role of Public-Private Partnerships in waste management**

For successful implementation of the 3Rs approach and waste segregation in cities, partnerships based on multi-stakeholder engagement are essential. This requires high commitment and continuous support from the city government to engage and communicate with citizens and other stakeholders.

Awareness campaigns need to be followed-up with necessary enabling systems to produce the desired behavioral changes among the people (village cleansing day in Lao, environmental cadres in Surabaya). Cities can use both penalties (Cambodia) and incentives (community award system in Surabaya) for motivating citizen participation for the 3Rs activities.

Cost recovery is essential for providing effective solid waste management by the city. This can be collected as direct (user-charge) or in-direct payment (for buying garbage bag in Kitakyushu).

Private sector involvement in waste collection, recycling business and treatment activities can improve the efficiency of solid waste management services (Singapore and Kitakyushu). However, its long term sustainability needs to be secured through local government support to reduce investment risks by the private sector.

## **4. Replication and scaling-up of successful models**

City to city cooperation, regional and global partnership for waste management is essential to undertake policy dialogue, international cooperation, knowledge management, technology transfer and information sharing.

International network organizations and partnerships play a vital role in facilitating the dissemination of effective practices and capacity building among cities in need. New tools such as online forums and databases are an emerging means for knowledge management and sharing.

## **5. Conclusions**

The session was concluded by giving some important lessons from both mega cities and small cities in both developed and developing countries.

- Importance of integrated solid waste management approach, based on the 3Rs to cope with the challenges of increasing municipal solid waste generation in rapidly urbanizing Asia.
- Participation and collaboration among stakeholders, esp. collaboration with private sector, strong leadership from local governments, supportive policy framework from national governments and the economic incentives and enforcement are essential.
- Awareness-raising is very critical for the environmental sustainable waste management, but the presence of an experienced/trained facilitator on the ground is very important; focus on a target group is essential.
- Waste reduction, reuse and recycling, and waste-to-energy activities are very important; baseline data on material flows is important for evaluating projects after implementation, and for cost benefit analysis (how is cost benefit involved?; how are 3R activities economically beneficial) and for measuring contributions to GHG emission reductions.
- To realize ESC in Asia, it is essential for cities to set locally relevant and practical standards based on the experience and lessons learned through existing good practices. This know-how can be facilitated through city to city networks, regional and global partnerships.

## **II) Summary of Thematic Session B: Urban Air Quality Management**

This session was chaired by Dr. Wijarn Simachaya, Deputy Director-General, Pollution Control Department, Ministry of Natural Resources and Environment in Thailand and co-chaired by Attorney Glynda Bathan, Policy and Partnerships Manager, CAI-Asia. Five presentations around the theme of 'Urban Air Quality Management' were made:

1. *Urban Air Quality Management: Lessons Learned from Bangkok City, Thailand* by Dr. Wijarn Simachaya, Deputy Director-General, Pollution Control Department, Ministry of Natural Resources and Environment in Thailand;
2. *Singapore's Urban Air Quality Monitoring and Management* by Mrs. Indrani Rajaram, Chief Scientific Officer, Pollution Control Department, National Environment Agency, Singapore;
3. *City of Iloilo: Clean Air Program* by Mr. Noel Hechanova, Head II, City Government Department in Iloilo City, Philippines;
4. *Cagayan de Oro City, Philippines* by Ms. Estrella Sagalar, City Planning and Development Coordinator, Cagayan de Oro City; and
5. *Building Networks for Translating Knowledge into City Action* by Ms. Glynda Bathan, Policy and Partnerships Manager and Ms. Yan Peng, China Representative, CAI-Asia.

### **Discussion**

#### **1. Measurement and Standard Setting**

It is important to develop a feedback loop for monitoring, planning and implementing air quality management measures. The bigger cities (e.g. Bangkok and Singapore) already have technologies in place to measure air quality at strategic locations around their cities. This equipment is expensive, however, and many cities do not have portable equipment to measure air quality. The smaller cities (e.g. Cagayan de Oro City and Iloilo) seem to solicit help from local universities to create air quality inventories. Economic, political, and social indicators are also needed because air quality has a direct impact on citizens, especially in relation to public health.

## **2. Information**

Gathering information about air quality is important for cities to create strategies for air quality management. Information exchanges involving multiple stakeholders (e.g. citizens, industry, NPOs, etc.) is a good way to spread information and make all stakeholders feel like they have ownership in the project. Networks, such as CAI-Asia, can provide information, such as best practice resources to cities. As Bangkok has shown, monitoring stations can be used to provide real-time air quality data and this information could be put on a website.

## **3. Capacity Development**

The major sources of air pollution must be understood and monitoring systems should be put in place to set standards. Self-reporting and record keeping at industries can be a useful way to build local capacity. Networking organizations can be helpful for capacity building in cities and many CAI-Asia projects, like green freight pilot projects in China, have been created to help with local capacity development. Some air quality management projects are only possible because of capacity development help of networking organizations.

## **4. Regulative Approaches**

Car inspections in both Bangkok and Singapore are used to control air quality standards. Economic tools can be used to discourage certain buying habits, such as Singapore's certificate of entitlement system for car ownership or Iloilo's program to restrict the number of jeepneys entering the city. Regulations to support enforcement, monitoring, and inspections are important to encourage better air quality management. Sometimes regulations can be put in place to regulate specific pollutants. By regulating gasoline quality, Bangkok was able to dramatically reduce lead levels.

## **5. Co-benefits approach**

Cities must take multiple approaches to improve their air quality. Some examples of their varied approaches include the development of clean vehicle standards, locating polluting industries far from the city center, linking policies such as land use planning and transportation, and mandating the use of less polluting gasoline.

## **6. Replication and Scaling-up of Successful Models**

Networking organizations are important to encourage scaling up models in Asian cities. While CAI-Asia is working to increase awareness, access to information, tools and partners for its members, it is trying to employ a scaling up strategy, as it estimates 2,500 more cities need their help. Several cities mentioned working with networking organizations such as CITYNET, ICLEI, ASEAN-GTZ and USAID Sustainable Energy Development Program. CAI-Asia China has collaborated with the national government on projects, and was recently invited by the Ministry of Environmental Protection (MEP) to provide a policy brief of co-benefits and has also started a long-term strategic cooperation with the Ministry of Transportation to work on green freight issues. Horizontal experience sharing is important for cities, like CAI-Asia China's proposal to include the entire Yangzi River Delta area in Shanghai's efforts to create a clean Yangzi River delta area. Mega events are a good way to share successful models.

## **7. Opportunities for Public Private Partnerships**

In Thailand, a certification system could be created so that private companies could help the Ministry of Transportation complete the mandatory vehicle inspections. In Singapore, the government holds regular seminars to get feedback from stakeholders, including the private sector. One stop service centers have been also been created in Singapore to give private industries advice about air quality management. In Cagayan de Oro City, a private garbage collection scheme is starting, which will increase efficiency in the city and also discourage open burning of garbage. It was also acknowledged in this city that public private partnerships will be a key to achieving many of the city's current and future projects. If the burden is not only on the city, solutions can be reached on a collaboration basis and the success of many projects can be attributed to these partnerships.

## **8. Implication for low-carbon development**

Cities are working on co-benefit activities, but many expressed their lack of equipment to properly measure greenhouse gas emissions. Before measures can be taken to reduce GHG emissions, the cities must first identify the main sources to create the most effective mitigation strategy. Some cities also expressed the lack of public awareness as a barrier to tackling the issue of GHG mitigation. European emission standards for new vehicles are currently used as reference standards for ASEAN countries, which should decrease GHG emissions.

### **III) Thematic Session C: Sustainable Planning Towards a Livable City**

This session was chaired by Mr. Lee Heng Keng, Deputy Director General (Operations), Department of Environment, Malaysia and co-chaired by Mr. Masakazu Ichimura, Chief, Environment and Development Policy Section, ESCAP. Six presentations around the theme of 'Sustainable Planning towards a Livable City' were made:

1. *Green Township Policy Initiatives in Malaysia* by Dr. Dahlia bt Rosly, Town and Country Planning Department, Malaysia;
2. *Gwanggyo Newtown Sustainable Development Vision & Strategies in Korea* by Mr. Lee Kay-Sam and Mr. Park Jin-Hyeong, Geonggi Provincial Government, Republic of Korea;
3. *Engaging Private-Public Participation Towards Sustainable City Development* by Mr. Haji Onn Bin Abdullah, City of Kuching North, Malaysia;
4. *Practice Scientific View of Development, Promote Ecological Civilization: The Experience of Building a National Environmental Protection Model City* by Mr. Dai Xiang, Deputy Director, Department of Pollution Control and Prevention, Ministry of Environmental Protection, China;
5. *Kitakyushu Asian Centre for Low Carbon Society* by Mr. Kengo Ishida, Kitakyushu City, Japan; and
6. *Overview of Eco-cities Development in China* by Ms. Li Yujun, Chinese Academy of Social Sciences, China. The above presentations and discussion touched upon a wide variety of issues on the sustainable planning of livable cities.

#### **Discussion**

##### **1. Different Goals**

Participants expressed that there is a need for a common understanding of the terms "eco" and "sustainable" cities being used. It was observed that each local government is facing specific gaps and challenges and making its effort to capture local needs unique to each locality, country and region. Such needs are not necessarily to be identified through

quantitative indicators but sometimes effectively verified through direct communication with residents for example.

It was also observed that some governments use 'Model' to concretize concepts of 'eco' or 'sustainable' city, whilst in Kuching North City, it gives emphasis to the healthy living such as healthy village, healthy street, and healthy schools. In the case of China, some cities have developed ecological activities as environmental model cities. Importance of inclusiveness was also emphasized. In Gwanggyo, Korea, urban development has been progressed by residents, civic group, environmental organization, and media.

## **2. Variety of approaches**

Variety of approaches was raised during the session. Big investment was introduced as an example of Gwanggyo New Town Development Vision and Strategies in Korea. In addition to new urban development, more social partnership-based interventions in existing cities have been adopted. In Kitakyushu City, Japan, international cooperation has been promoted where environmental technologies have been transferred from Kitakyushu City to many Asian countries, such as Indonesia and China. These technologies were revised based on local characteristics and needs.

Stakeholders include private businesses participating in economic opportunity. For example, with the cooperation of Yaskawa Electric Corporation, Kitakyushu City has tried to develop the bilateral credit mechanism with China. The above development approaches and strategies have enforced sustainable development towards livable cities.

## **3. Different policy measures**

Different levels of interventions for sustainable planning of livable cities were introduced. In the case of China, there are local, national, and international initiatives to promote eco cities. It was also underlined that combination or policy mix of available measures is important. Opportunities lie in existing challenges in social, economic, and environmental policies.

The session reaffirmed the key role of local government in the context of sustainable planning towards livable cities. Local government is close to citizens by its nature, therefore dealing with citizens' life in a holistic manner.

## **4. Key Implications**

### **1. Sustainable planning: social, economic and environmental aspects**

Importance of sustainable planning was widely shared among the session participants. At the same time, there were a number of different aspects of urban sustainability, yet common in their basic direction, of sustainability, as well as those of livability were raised for discussion. They include the three pillars of sustainable development namely social, economic, and environmental aspects. Social aspects of sustainable livability include such concepts as safety, health, happiness, level of public satisfaction, cultural viability, etc. Economic aspects include economic viability, public transportation, energy, etc. At last, but not least, environmental aspects include low-carbon, pollution prevention, air and water quality, 3Rs, green building, urban green space per capita, conservation, etc. Importance of social issues and relevant indicators are reiterated during the discussion session: such indicators include, employment rate, availability of social security services, etc.

Some session participants also emphasized the importance of a green lifestyle, which should go along with the sustainable planning of livable cities. Such urban design to optimize energy and resource efficiency will require a lifestyle change. Sustainable consumption will be the key part of such lifestyle, for which 'housewife prosumer' movement, through which females are reflected on designing and decision-making, in the Republic of Korea may be one of the advanced cases. It also underlined that public awareness and green consciousness are indispensable.

### **2. Multi-stakeholder participation for sustainable planning**

Multi-stakeholder participation is important in different stages of sustainable urban planning, which include problem identification stage, planning stage, and implementation stage. Partnerships between public sector, private sector, and civil societies are essential. To this end, a consensus among relevant stakeholders needs to be achieved, for which a city planning committee participated by multi-stakeholder observed in Malaysia could be effective. In the case of Geonggi Province in the Republic of Korea, citizens' idea contest is in practice for better urban planning. In the case of sustainable planning of livable cities, local authorities play secretariat role and/or facilitator role. Malaysia also introduced legislation to ensure public participation to the planning process.

### **3. Opportunities for replication/scaling-up**

There are different types of opportunity for promoting sustainable planning towards livable city. In the case of China, eco-city programs are led through both international cooperation and domestic initiatives. The latter case include those facilitated by local government, while initiatives such as 'National Environmental Protection Model Cities' and 'Eco-model Area' are led by the central government. Further examples of transferring successful experiences include 'transfer Eco-Town experience from Kitakyushu to Dalian' and 'transfer of Kitakyushu Smart Community concept to Surabaya.'

### **4. Opportunities for Public Private Partnership (PPP) and implication for low-carbon development**

Invitation from the Kitakyushu Overseas Water Business Promotion Council (KOWBPC) was announced for future business development in the form of PPP. An example of Public Private Partnership for GHG emission reduction between Yaskawa Electric Corporation and Asian Center for Low-Carbon Society (ACLCS) was introduced. Kitakyushu City expressed its intention to accelerate such technical support to environmentally committed cities in the region through enhancing the current ACLCS activities.

#### **IV) Thematic Session D: Adapting Cities to Changing Climates**

This session was chaired by Mr. Allen Kearns, Sustainable Cities and Coasts, Climate Adaptation Flagship, CSIRO, Australia and co-chaired by Ms. Liana Bratasida, Assistant Minister for Global Environmental Affairs, Ministry of Environment, Indonesia. A total of 9 presentations were made:

1. *Adapting Cities to Climate Change in East Asia, An Overview* by Ms. Seona Meharg, Theme Manager, Sustainable Cities and Coasts, Climate Adaptation Flagship CSIRO;
2. *Contribute to Climate Change: Waste management and Urban forest Improvement in Koh Kong town, Cambodia* by Mr. Chey Pich Rathna, Director, Environment Bureau, Koh Kong Province, Cambodia;
3. *Adapting to Climate Change: Cities in Indonesia* by Ms. Liana Bratasida, Assistant Minister for Global Environmental Affairs, Ministry of Environment, Indonesia;
4. *Mainstreaming Climate Change Adaptation and Disaster Risk Reduction in the Local Planning System: the Case of Puerto Princesa City, Philippines* by Ms. Jovenee Sagun, City Planning and Development Coordinator;
5. *Status of Establishing Low Carbon Green City in Korea* by Ms. Jung Yeon, Assistant Manager, Department of Energy Business/Eco Energy Town, Korea Environment Corporation;
6. *Local Practical Responses to Climate Change: Experiences of Local Governments and Schools in Thailand* by Dr. Paul C. Vorratchaiphan, Senior Director, TEI;
7. *WaterLinks: Planning for Climate Change Impact in Manila (Philippines) through Partnership* by Mr. Arijanto Istandar, Water and Sanitation Team Leader, USAID ECO-Asia;
8. *ICLEI's Approach for Climate Resilient Cities* by Ms. Michie Kishigami, Director, ICLEI Japan Office; and
9. *Climate Disaster Resilience Initiative* by Dr. Bernadia Tjandradewi, CITYNET Programme Director.

Both presentations and discussions touched upon a wide variety of issues on Adapting Cities to Changing Climates.

## **Discussion**

Session Chair, Mr. Allen Kearns, started the session by presenting a framework of overall responses to climate change, i.e. climate change mitigation, adaptation, and impacts. Presentations and discussions were made within the framework and provided several important lessons learned for all the participants in the session.

Ms. Seona Meharg, Theme Manager, Sustainable Cities and Coasts, Climate Adaptation Flagship CSIRO presented 'Adapting Cities to Climate Change in East Asia'. The presentation focused on how water infrastructure and waste water would be impacted by the climate change through two case studies in Vietnam and Indonesia. More effective use of data and tools to measure city performance is necessary in developing successful climate change approach. Among the issues discussed are learning how to work with different institutions including research organization, donors and local governments; how to develop effective communication between partnering institutions; and how to fill the information gaps that occurred at local level.

Mr. Chey Pich Rathna, Director, Environment Bureau, Koh Kong Province, Cambodia presented 'Contribute to Climate Change: Waste management and Urban forest Improvement in Koh Kong town, Cambodia'. Waste generation in the province is increasing due to population growth and economic development. On the other side, many problems occurred such as limited public awareness leading to limited participation, illegal dumping, no presence of waste collection system, and other problems. Local government has taken several actions to deal with the problem including public awareness campaign, infrastructure provision, community-based approach, setting SWM targets and other specific actions. For better management in the future, the province would need financial and technical assistance, especially in developing SWM plan.

Ms. Liana Bratasida, Assistant Minister for Global Environmental Affairs, Ministry of Environment, Indonesia presented a climate change road map in Indonesia that incorporates capacity building, funding allocation, various policy instruments and regulations. A demonstration project was developed in Lombok Island. The project demonstrated that community resilience is affected by climate change. Regarding methodologies for climate

change adaptation, it is difficult to develop a uniform method because Indonesia has so many islands with different ecosystems, but general principles may be produced to guide the local adaptation of the methodologies. Science-based risk and adaptation assessment, information and knowledge sharing, as well as stakeholder cooperation are among the important factors.

*Ms. Jovenee Sagun, City Planning and Development Coordinator, Puerto Princesa City, Philippines* presented the case of local planning system through mainstreaming of climate change adaptation (CCA) and Disaster Risk Reduction and Management (DRRM) into comprehensive planning. The integration should include measures that target to reduce vulnerabilities and increase the capacities of local communities, especially women, children, elderly people.

Presentation of Ms. Yeon Jung, from Department of Energy Business/Eco Energy Town, Korea Environment Corporation highlighted the "Status of Establishing Low Carbon Green City in Korea". It described the green eco-friendly city project demonstration at Kyong-po area in Korea, an urban planning model that was developed as a part of climate change mitigation in the country. The green city model incorporated three main strategies, i.e. natural eco city, public participation, and green infrastructures that were translated into several programs. Korea plans to expand the model to 16 cities by 2013. To realize the plan, the country is developing key evaluation indicators on green city and establishing evaluation toolkit for performance assessment.

Dr. Paul C. Vorratchaiphan, Senior Director, TEI, presented "Local Practical Responses to Climate Change: Experiences of Local Governments and Schools in Thailand". The presentation illustrated education projects for school children and teachers about climate change mitigation and adaptation. Leadership, methodology, budget allocation, and partnership are the key factors for successful climate change mitigation. In addition, private sector involvement and collaboration of international organizations are necessary. Holistic and integrated view is also important in linking city strategies with climate change adaptation, through the planning and development processes and activities.

Mr. Arijanto Istandar, Water and Sanitation Team Leader, USAID ECO-Asia, presented an activity to promote the replication of good practices in waste water resources to adapt to the impacts of climate change. Focusing on knowledge transfer, Water Links connects the Palm Beach Water Utility Department in Florida, U.S to two water private operators in Metro

Manila, the Philippines. The activity is currently in planning stage, so the result is yet to be seen. Planned activities focus on training on software or analytical tools application, consultation, and framework development.

Ms. Michie Kishigami, Director, ICLEI Japan Office presented the "ICLEI's Approach for Climate Resilient Cities" started her presentation by touching upon the important role of local government to save lives and properties of local communities and to increase community resilience in reference. Internal incentives, as well as city leadership and reputation, are stronger motivation for cities to initiate the climate adaptation planning than external pressures. ICLEI can provide assistance, planning tools, technical guidance, and training and networking for cities in their initiatives for climate adaptation planning.

Dr. Bernadia Tjandradewi, CITYNET Programme Director, focused on CITYNET's activity in disaster risk reduction. The NGO collaborates with local governments, as well as other NGOs, research institutions, and private companies in their work. Through its collaboration with local Japanese universities, UNU, UN-ISDR, the NGO developed a risk assessment method to help cities establish short, medium, and long term plans. It is necessary to integrate DRR to city planning and services, as well as developing platform for stakeholder participation.

## **Conclusions**

### **1. Integrated policy, program and plan**

The presentation pointed out that internal incentives within the city, as well as city leadership and reputation, may be a stronger motivation for cities to initiate the climate adaptation planning than external pressures. For future improvement, there is a need to integrate the climate change adaptation to comprehensive policy, program, or plan at national, regional, and local level. There is also a need to translate them to sectoral planning at these various levels. In addition, it should consider developing law and regulation, strategy, action plan that can be adapted according to local context.

### **2. Improving data and methodology for analysis**

Information is not necessarily available in every city. The challenge is how to find a way to fill the information gaps. In addition, it is difficult to have a uniform methodology, but it is

possible to extract several guiding principles. Developing tools, methodologies, or strategies based on the local context is needed.

### **3. Understanding the roles of stakeholders, and develop collaboration and partnership**

Networks can facilitate partnership, knowledge sharing and best practices in the region. Local government should develop the city and community's resilience in facing the climate change and its consequences. Whereas, private sector involvement may provide expertise or methodologies needed to improve the planning and implementation of climate change adaptation projects. Frameworks and platforms for stakeholder participation are necessary.

### **4. Capacity building**

Capacity building, especially for local government co-ordination and climate adaptation, knowledge management and sharing of information with the scientist, community and other institutions, is needed. In addition, national governments need to provide assistance to LGs, including financial and technical assistance. Education for climate change needs to be incorporated into the current system, in order to increase the awareness of the future generation.

### **5. Replication of best practices**

Various institutions, such as research organizations, donor agencies, and local government may have different understanding and expectations on current and future research agenda. Compiling experiences of various demonstrations projects/best practices developed by different institutions is necessary in order to learn from these experiences and not having to start from zero.

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