

BUILDING RESILIENT CITIES IN ASIA: FROM THEORY TO PRACTICE

1 Context/Rationale

In response to the recent increase in wind and flood damages caused by climate change and large-scale natural disasters like the Great East Japan Earthquake, cities are aiming to develop resilience to cope with such external risks. Furthermore, to maintain city functions supporting social and economic systems even during a disaster, cities have started focusing not only on disaster risk reduction and mitigation, but also on measures to maintain an energy supply and ways to transition urban structure. IGES is carrying out joint research on these new trends with the Universities of Nagoya, Hosei and Osaka, and this session introduced the activities and plans of selected cities in Japan and overseas. It featured discussions on how efforts could be evaluated, promoted and mainstreamed into city development plans.

2 Objectives

The session explored the current status of resilient cities in Asia through:

- Review the current status and identify the main challenges in the area of urban risk reduction and management.
- Discuss the concept and identify practical measures (based on both Japanese and other Asian Cities) in achieving resilient city.
- Identify gaps as well as actions to accelerate national and local implementation of the resilient policy measures.
- Share expectations and identify some suggestions to promote resilient cities in the global agendas, including UNISDR, ICLEI and APAN.



3 List of Speakers

[Moderators]

Mitsuru Tanaka Professor, Faculty of Social Sciences, Hosei University

Toshizo Maeda Leader / Principal Policy Researcher, Sustainable Cities Area, Kitakyushu Urban Centre, IGES

[Keynote Speaker]

Ryutaro Yatsu Senior Adviser, Ministry of the Environment, Japan

[Speakers]

Kenshi Baba Professor, Hosei University

Noriko Sugiyama Designated Associate Professor,
Graduate School of Environmental Studies, Nagoya University

Akihiro Tokai Professor, Division of Sustainable Energy and Environmental Engineering,
Graduate School of Engineering, Osaka University / Director, On-site Research Center for
Sustainability Design, Graduate School of Engineering, Osaka University

Dickella Gamaralalage Jagath Premakumara

Task Manager / Senior Policy Researcher, Sustainable Cities Area, Kitakyushu Urban Centre, IGES

[Discussants]

Ana Cristina Angulo-Thorlund Knowledge Management Officer, International Recovery Platform,
United Nations Office for Disaster Risk Reduction (UNISDR)

Michie Kishigami Director, ICLEI - Local Governments for Sustainability Japan Office

Puja Sawhney Asia Pacific Adaptation Network (APAN) Coordinator, Regional Centre, IGES

4 Key Messages

- **Various methodologies for resiliency are being developed in a scientific manner however how these methodologies can be effectively shared is still under consideration.**
- **Resiliency work is happening in parallel in cities, city networks, international organisations and academia. It is necessary to further integrate these insights to maximise resources and raise capacity and awareness.**
- **Target setting and post-disaster visions of regions need to be considered to enable communities to fully recover from disaster.**
- **The role of eco-systems in resiliency is only now starting to be more fully considered, and this aspect needs a greater role.**
- **Following the Great East Japan Earthquake, the role of communities and relations was acknowledged within Japan as vital for the recovery of the area, where voluntary action has had a large impact. Community based work is a vital component of resiliency and cannot be ignored.**
- **Resiliency is starting to find its roots in cities, but needs further support and development to flourish.**

5 Summary of Presentation

Ryutaro Yatsu discussed climate change resilience and disaster resilience within Japan and how this experience has been shared abroad. An assessment of the climate change impacts on Japan has revealed these will be mainly felt in food production (rice and fruits); floods; an increase in tropical diseases and heatstroke; and biodiversity. Work is on-going towards a national plan for climate change resilience which will be published in the summer of 2015. In order to facilitate both national and international work in this area, Japan is assisting with the creation of networks involving academia, international organisations, national governments, private sector and other stakeholders with examples of this including research in Indonesia and the Philippines. Many of the lessons of disaster risk reduction are based on the lessons learned following the Hanshin (1995) and Great East Japan (2011) earthquakes. There were six major areas where the government was involved: rapid establishment of final disposal facilities for waste; recycling and reuse; formulation of unified guidelines; asbestos damage; debris washed into the ocean; prevention of the infectious diseases and odours. In addition, the impacts of potential earthquakes in the Nankai Trough and Tokyo areas have been assessed with preparations underway. For effective planning, the creation of networks to share findings is vital, particularly in terms of planning and preparation to prevent public panic post-disaster. Public health is a key point with improvements needed to focus on this. All measures should be taken with other Asian countries to ensure lessons are disseminated.

Kenshi Baba presented on resiliency in the Japanese context and the framework policy model created through the research undertaken by Hosei University. Resiliency in Japan is mainly focused on disaster risk reduction with the roles of environmental policy to build resilience yet to be clarified. To this end, a framework policy model which is a hypothetical flow describing the whole process of policymaking has been created. This model assumes that three components – external force risk, vulnerability and situation to be avoided determine the preparedness and/or implementation status of resilient policies. Three categories of resilient policies are identified with an exposure amount to external force risk and influence to system – a precautionary measure, an adaptive measure and a transformation measure. Then, these components are measured by three indices – an urban index (assessing resilience in terms of infrastructure, economy and environment); an administrative index (assessment in terms of existing policies and preparedness); and a civic index (assessment in terms of social capital and knowledge). Thus far, over 100 indices of local governments have been set-up to create a summary status report. Once created, it is expected to share the current situation of resilience and integrate them into local government planning through some participatory approaches such as scenario workshop.

Noriko Sugiyama presented Nagoya University's research into a policy model for energy resilience. Energy resilience is defined as the ability of the city's energy system to respond to systematic risks caused by natural disaster and climate change and is divided into three categories: prevention (making the network stronger); adaption (early restoration of damaged facilities etc.), and transformation (transformation to a distributed energy system). The policy model has been based on three indicators: resilience value (the cost which could avert damage by resilience measures); CO₂ emissions reduction, and amount of capital investment required. Through this analysis it was discovered that transformation is the most effective measure of the three. Transformation to a distributed energy system such as combined heat and power has been shown to be effective in Berlin, with Germany overall showing greater efficiency than Japan. It is hoped that the results from this research can be used to assist Japan in becoming more energy resilient.

Akihiro Tokai explained that Osaka University has been examining resiliency based on risk assessment. The research employs actual multiple risks in the urban area with a hierarchical approach composed of screening multiple risk and analysing specific response profile. Following an assessment of 21 multiple hazards across the themes of technology, natural phenomena, institutions with a particular focus on

climate change, self-supporting energy, damage to eco-system and natural disasters it was found there was considerable variation between local governments concerning their evaluation and provision of risks. Moreover work was done into actual scenario planning including a simulated outcome of a large earthquake on the water supply system which highlighted gaps in the current approach. Future tasks include sharing the case study and customising the methodology based on data availability.

Dickella Gamaralalage Jagath Premakumara explained IGES's work in reviewing the experience of four Asian Cities (Cebu, Philippines; Nonthaburi, Thailand; Ho Chi Minh, Viet Nam; Shanghai, China) and identifying the progress, challenges and key recommendations in planning and implementation of resilient cities. The cities have a variety of vulnerabilities, ranging from flooding and typhoon risks to food security and landslides. Through a literature review, a resilient city framework was defined whereby resilient cities are created through the combination of governance, hardware (infrastructure and eco-system) and software (social agents). In order to realise resilient cities in Asia there are considerable hurdles. In terms of governance there is a lack of policies, institutional support, capacity and funding. In terms of social agents there is a lack of effective education and training programmes, limited capacity and social safety networks. Regarding infrastructure, there are budget limitations, weak enforcement and a lack of capacity. In contrast, Japanese cities that are located in disaster-prone areas have developed advanced disaster prevention and resilience measures in partnership with private, academia and civil society. These experiences are being gathered by Nagoya, Hosei and Osaka universities which are creating resilience policy models, indicators and risk assessment methods in collaboration with IGES which is then disseminating this knowledge to Asian cities directly and via international platforms with the involvement of UNISDR, ICLEI, APAN and LoCARNet.

Ana Cristina Angulo-Thorlund explained that UNISDR, the office responsible for disaster risk management, has worked with 1,760 cities in 98 countries, covering more than 700 million people with the aim of achieving resilient, sustainable urban communities through actions taken by local governments to reduce disaster risk through knowing more, investing wisely and building more safely. It is the largest global movement of cities, having grown to 1,760 from 250 in 4 years with a presence across the globe. It is founded on the idea of 10 essentials of resiliency – organisation and coordination; budgeting; understanding risk; infrastructure protection that reduces risk; protection of vital health and education facilities; risk compliant regulation and land use planning; training, education and awareness; environmental protection and the eco-system; effective preparedness; recovering and rebuilding communities. What has made the programme work is ensuring that human capital, social capital and structural capital are all combined towards a global movement to ensure maximum effectiveness. To assist the cities, a large number of tools have been created to enable effective self-assessment to discover resiliency gaps, including the use of mapping technologies and mobile apps.

Michie Kishigami commented that ICLEI is an association of local governments that works by connecting leaders, accelerating actions through pilot programmes as well as creating tools and holding workshops to boost capacity. Resilient City is one of ICLEI's eight core areas and aims to give local governments the tools and services, networks and advocacy to ensure that cities have a low risk to natural and man-made disasters and to reduce their vulnerability by building on their capacity to respond to climate change challenges, disasters, and any foreseen events and economic shocks. ICLEI has four major projects in this area: the Commitment of the Mayors; a global forum; a reporting framework, and regional projects in Asia. The Commitment of the Mayors currently has 114 signatories from 27 countries to ensure cities respond to climate change risks. The Global Forum on Urban Resilience and Adaptation is held annually with 500 participants from around 50 countries. The Cities Climate Registry is the world's largest global database of local climate action with 423 reporting cities, 566 commitments, 771 GHG inventories and 4,208 actions listed. ICLEI has also been involved in a variety of regional projects such as US-J Local adaptation exchange (USA, Japan); Community training on climate mitigation & adaptation (Philippines,

Japan); Urban Nexus (Integrated Resource Management in Asian Cities) in six Asian countries; Asian Cities Adapt (India & Philippines, Research institutes); Asian Cities Climate Change Resilience Network (India, Indonesia, Thailand, Vietnam).

Puja Sawhney talked about the purpose of the Asia Pacific Adaptation Network (APAN) which is to mobilise knowledge and building capacities for climate resilience. APAN has built up a network of climate change adaptation practitioners across a wide range of regional stakeholders including development banks, city networks, research institutions, national governments and international organisations. APAN's core activities are knowledge management, knowledge synthesis, Asia-Pacific Climate Change Adaptation Forum, and sub-regional and thematic conferences with targeted training workshops. APAN's web portal boasts a database of extensively curated resources, databases on CCA good practices, projects and technologies. APAN's newsletter has over 5,000 subscribers. APAN has extensive experience on different issues related to disaster risk reduction and climate change adaptation including urban resilience. The key lies in learning and sharing experiences with other organisations projects in the region on the various issues, priorities and topics in the region through knowledge management (uploading relevant information and publications on the APAN website), the APAN Forum, joint research, joint proposal/joint implementation and joint activities including workshops/conferences to disseminate the outputs of work, learn about new and emerging issues and priorities on the topic; identify needs and gaps for further research and capacity building of relevant stakeholders as well as encouraging peer to peer learning.

6 Summary of Discussion

UNISDR asked how the national Philippine legislation concerning resiliency has played out at the local level. In response to this, IGES explained that under the law, Philippine cities must comply with three requirements namely, establishing a resiliency office, using 5% of the local budget for resiliency and preparing a disaster risk reduction plan. All cities have established such offices but are having difficulties in the funding and also often lack the capacity to create a disaster risk reduction plan. ICLEI then asked how local governments respond to the research undertaken and if the department of environment and disaster risk reduction react to resilience in different ways. The response from Hosei University was that the integration of research into policy and also policy integration of diversified departments in policy process are an eternal theme. The result of our questionnaire to municipalities showed that the department of environment, disaster risk reduction and planning have absolutely different responses to external force risk, vulnerability and the situation to be avoided. These statuses will form an integrated report for each municipality and be used as one of the materials for discussion in scenario workshops. Through these trials, it is expected that difficulties of integration will be solved. Nagoya city commented that local governments are the focus of its research, so it is hoping to disseminate its findings through international networks. Research in Osaka concentrated on cities with populations of 300,000 – 400,000 so the scope is narrow. Hosei University has almost two years left on the project so it stated that there is further room to expand the scope of the project. APAN had a question concerning IGES research, and asked if lessons have been shared with the cities and what the commonalities were. IGES replied that the four cities did not all have common points. Ho Chi Minh, Nonthaburi and Cebu were similar due to their flooding issues, an interest in low cost technology and community based work. Shanghai was more advanced and had funds for infrastructure as well as community based projects. Cebu had a good institutional set up, whereas Nonthaburi and Ho Chi Minh are further behind in this aspect.