

Climate Change Risk Assessment in Asian Coastal Megacities: Knowledge Gaps and Research Needs for Urban Development Planning

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Abstract

The present paper highlights key issues confronting Asian coastal megacities in planning for future climate change. Critical gaps in information/knowledge for carrying out risk and vulnerability assessments to support urban development planning were highlighted at an APN and Ibaraki University-sponsored workshop by expert teams representing Bangkok, Ho Chi Minh City, Jakarta, Manila and Mumbai.

The workshop - *Climate Change Vulnerability Assessment and Urban Development Planning for Asian Coastal Cities* - held from 22-28 August 2010 in Nakhon Pathom, Thailand, brought together over 40 participants including academics, urban planners and officials, and experts in disaster management.

The workshop identified current information/knowledge gaps and challenges, and identified future research opportunities. Key findings distilled from the workshop were grouped into three categories - 'assessment of climate change related risk,' 'information/knowledge management,' and 'governance.' Across these themes,

some 25 specific observations and recommendations for future research were identified.

It is anticipated that key findings from this workshop will shape the future research agenda in these cities. Some of the key findings and research recommendations included the following: Risk assessments were hampered by inadequate information, ranging from the lack of baseline climate data to the need for developing indicators for determining socio-economic vulnerabilities; food and water security and health assessments demanded greater attention; access and dissemination of information was limited, with development of online information/knowledge management systems deficient; future capacity building activities proposed included developing an integrated course on urban development and climate change; and, a spectrum of governance-related matters were raised including issues of institutional coordination, deficiencies in existing city plans, development of building codes, vulnerability of the poor, and challenges of funding.



Keywords: *climate change, risk assessment, adaptation, urban planning, knowledge management, megacities*

Introduction

The workshop built on the first *Cities at Risk* (CAR) workshop held February 2009 in Bangkok - *Developing Adaptive Capacity for Climate Change in Asia's Coastal Megacities* - supported by APN and partners (CBA2008-06NSY, 2008). The CAR workshop highlighted the misled perception, particularly on the part of city officials, on the size of growing risks and vulnerabilities that now confront coastal Asian megacities. Moreover, UNESCAP (2009) stated recently that "it is paramount that risk reduction becomes part and parcel of urban planning," which unfortunately is not the case at present; a situation that the workshop directly addressed. Climate change risk and vulnerability assessments can play a key role in raising awareness of climate-related risks, and in leading to more informed decision-making. Unfortunately, as noted in the CAR workshop, the capacity to carry out such assessments is currently lacking in most coastal Asian cities.

The workshop conducted through the present activity (CIA2009-01-SNIDVONGS, 2010) aimed to raise awareness and improve capacity to assess climate change-related risk and vulnerability in five Asian coastal megacities – Bangkok, Ho Chi Minh City, Jakarta, Manila, and Mumbai. Workshop objectives included:

- i. helping develop capacity on the part of urban planners, managers, and researchers in climate change vulnerability assessment and application to urban development planning and governance;
- ii. promoting locally-led vulnerability research in Asian coastal cities linked to user needs; and
- iii. helping develop partnerships between researchers, planners, and policy-makers, and to develop communities of knowledge for vulnerability assessments in each participating city.

The workshop was primarily funded by APN with additional financial support from Ibaraki University (Japan), hosted by the Southeast Asia START Regional Centre (SEA START RC) of Chulalongkorn University and co-organised with the East-West Centre, Hawaii.

Material and Methods

Pre-workshop Activity: Preparation of City Reports

Prior to the workshop, groups of researchers and urban planning practitioners representing each City at the workshop – Bangkok, Ho Chi Minh City (HCMC), Jakarta, Manila and Mumbai – were invited to prepare a 'City Report' on climate change risk and vulnerability assessments in relation to urban development planning for their home City. These reports represented a key source of information for better understanding current efforts in integrating climate risk into development and planning in

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each of the five Cities and for better identifying future research and capacity building needs.

Approach to Synthesis

Pertinent information was extracted from the City Reports (submitted prior to the workshop), City Report Presentations (workshop day 2), Research Proposal presentations (workshop day 6) and abstracts (submitted post-workshop)¹. City teams were requested post-workshop to prepare one page abstracts based on the City Reports and presentations under three main categories - 'assessment of climate change related risks,' 'information/knowledge management,' and 'governance.'

Results and Discussion

The workshop identified current information/knowledge gaps and future research opportunities for addressing climate change-related risks and vulnerability in Bangkok, HCMC, Jakarta, Manila and Mumbai. These are summarised below.

Category 1: Assessment of climate change related risks (hazards and socio-economic vulnerabilities)

1. Improve stakeholder perception of risk
 - acknowledging the vulnerability of the poor to the impacts of climate change
2. Better define urban hazard factors
3. Assess risk to water and food security, including
 - consumption, water quality, sanitation, waste management, agriculture, aquatic systems
4. Address lack of baseline climate data, including
 - temperature, sea level and social impact (see item 8 below on socio-economic vulnerabilities)
5. Conduct health risk assessments, including
 - assessing the link between climate change and health impacts

6. Recognise the importance of green space in moderating air temperature and flood prevention
7. Recognise the potential future impacts of coastal erosion
8. Conduct socio-economic vulnerability assessments
 - addressing limited information on social aspects of vulnerability
 - integrating existing studies to better understand the current situation
 - refining/identifying measures of risk
 - developing measures of social vulnerability
 - mapping vulnerabilities
 - integrating exposure, places, sectors, activities, individuals, households, social groups, communities, livelihoods into assessments
 - understanding how urban and rural areas are linked by migration
 - assessing the vulnerability of marginal groups/informal sector

Category 2: Information/knowledge management

9. Address provision of an information/knowledge management system, including
 - lack of a central information system, poor data collection and storage
 - the need for an interdisciplinary approach to development
10. Address limited availability of geographic information
11. Address integration of geographic information with socio-economic data
12. Address lack of GIS and mapping tools, and understanding of their application
13. Ensure access to information by stakeholders
14. Develop materials for information dissemination and target the most vulnerable communities
 - make better use of mass media



¹ City Reports, City Report Presentations, Research Proposal Presentations, and abstracts are accessible from the workshop report (CIA2009-01-SNIDVONGS, 2010) at <http://www.apn-gcr.org/newAPN/resources/list2009capableprojects.htm>

15. Expand capacity building activities, including
 - developing a course on urban development and climate change
 - integrating climate risk content into other courses (e.g., engineering)
 - conducting stakeholder workshops
16. Recognise limitations of existing early warning systems

Category 3: Governance

17. Address the need for an institutional linking mechanism
18. Address the lack of coordination between government agencies, NGOs, and the private sector
19. Build capacity of City officials
20. Assess the role of civil society groups in urban governance
21. Address deficiencies in existing planning instruments in incorporating climate change risk and vulnerability
22. Address development and enforcement of land use regulations and building and sanitation codes
23. Address vulnerability of marginal groups, including
 - invisibility in plans/assessments
 - inadequate dissemination of information to the poor
24. Investigate potential for climate-induced migration of population
25. Address challenges to allocating funds for climate change-related risks and vulnerabilities, including
 - availability and commitment
 - project-based and donor-driven support
 - raising of funds through fees paid by the local community
 - sustainability of initiatives

Future Opportunities

Opportunities to address these challenges faced by the Cities are anticipated through new projects commencing in 2011, including an APN-funded project titled - *Enhancing adaptation to climate change by integrating climate risk into long-term development plans and disaster management* – and an IDRC (of Canada) proposal - *Coastal Cities at Risk (CCaR): Building Adaptive Capacity for Managing Climate Change in Coastal Megacities*.

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