

Climate and Disaster Resilience Initiative (CDRI)

Project: Background

As cities all over the world have or are being urbanized rapidly, most cities have confronted environmental problems and resulted disaster risk issues. In the context of urban areas, especially in developing nations, it can be narrowed to the quality of life of living population, where disaster risk reduction and environmental management are closely interrelated. By 2050, the world population is expected to reach 9 billion people. Large numbers of people will be concentrated in megacities and on fragile lands, making reduction of vulnerability to disasters in metropolitan areas a critical challenge facing development. The challenge then is for the national government and most especially the local governments to develop effective policies, programs, and strategies that will help them manage urbanization to ensure development. The Climate and Disaster Resilience Initiative (CDRI) is an umbrella initiative of Kyoto University, funded by the Global Center of Excellence (GCOE) Program "Human Security Engineering for Asian Megacities," which has research, education, training, and implementation components.

Climate change will increase the hazard potential in many cities. Although climate change will affect everyone, developing countries like the Philippines will be hit hardest and soonest and will have the least capacity to respond. Climate change is happening now in the Philippines and the rest of Southeast Asia, and the worst is yet to come. The frequency and intensity of extreme weather events have also increased in recent years. This includes a significant increase in the number of heavy precipitations events and an increase in the number of tropical cyclones. Last year these climatic changes have led to massive flooding in many parts of the region, like the Philippines, Vietnam, Cambodia, and Thailand, causing extensive damage to property, assets, and human life, especially in the cities.

The project started in 2008, and is currently being implemented in four different phases. The first phase concentrated on the regional analysis of Asian cities, the second phase on country level analysis, the third phase on cluster cities analysis, and the fourth phase on neighbourhood analysis within the city.

Location

In 2008-2009, the Climate and Disaster Resilience Initiative (CDRI) used the Climate Disaster Resilience Index (CDRI) also to assess the existing level of climate disaster resilience of 15 cities across Asia: Banda Aceh, Indonesia; Bangkok, Thailand; Colombo, Sri Lanka; Danang, Vietnam; Dhaka, Bangladesh; Hanoi, Vietnam; Ho Chi Minh, Vietnam; Hue, Vietnam; Iloilo, Philippines; Makati, Philippines; Mumbai, India; San Fernando (La Union), Philippines; Sukabumi, Indonesia; Suwon, South Korea; and Yokohama, Japan. The cities' resilience was evaluated only against climate-related natural hazards, like typhoons, flooding, sea-level rise, rainfall-induced landslides, heat wave, and drought. The results show Hue in Vietnam and Makati in Philippines to have higher CDRI index. In 2009, a country based analysis was undertaken in India with primary focus on 12 cities of different size and location (mountain, river, coast and arid areas): Aizal, Amritsar, Bhubaneswar, Delhi, Guwahati, Jaipur, Kanpur, Kolkata, Nagpur, Port Blair, Shimla, and Varanasi. The analysis shows Port Blair, a coastal city in Andaman and Nicobar Islands has the highest resilience among different Indian cities. In 2009-2010, a similar study was conducted in 17 cities and municipalities in Metro Manila: Las Piñas, Makati, Malabon, Mandaluyong, Manila, Marikina, Muntinlupa, Navotas, Parañaque, Pasay, Pasig, Pateros, Quezon City, San Juan, Taguig, and Valenzuela. Currently, city specific neighbourhood analysis is being done in Delhi, Dhaka and Chennai. Therefore, a total of 44 cities in the Asia Pacific region are being studied under this initiative.

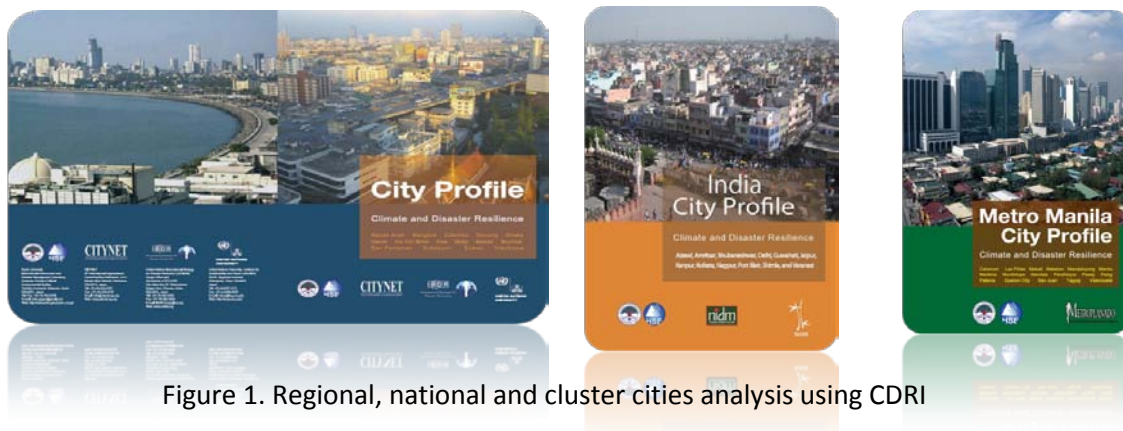


Figure 1. Regional, national and cluster cities analysis using CDRI

Results Achieved

CDRI measures climate disaster resilience by considering five dimensions: physical, social, economic, institutional, and natural. Each dimension has five parameters and each parameter in turn has five variables. Therefore, the CDRI questionnaire has 125 questions. Respondents are requested to assign weights to the variables and parameters in order to reflect the priorities of the cities and the relevance of the indicators to the local situation. Using data collected from the questionnaire surveys, we used Weighted Mean Index (WMI) method and Aggregate Weighted Mean Index (AWMI) to compute the scores for each parameter and dimension, respectively. The CDRI of the city is the simple average of the indexes of the five dimensions. The index value ranges from 1 to 5. Higher CDRI values are equivalent to higher preparedness to cope with climate change and disasters. Needless to say, these results are not absolute values, but serve mainly as broad policy guidance. The quality of the results is very much dependent on the quality of the input data from the survey respondents.

Based on the results, the strengths and weaknesses of the cities in each of the five dimensions are highlighted. Then policy points and recommendations are suggested to provide encouragement of city governments' engagements in specific institution and capacity building. Not only are outputs from this study useful for city governments, but they also provide valuable knowledge and information to other local and national stakeholders having a similar target: the enhancement of community resilience. Graphs are provided to help in visualizing the analysis results and to facilitate comparison between dimensions and between cities. One graph shows the city's overall resilience and five other graphs demonstrate the city's resilience in terms of the physical, social, economic, institutional, and natural aspects.

Challenges and Lessons

The key target of this initiative is to enhance action at the city level. The CDRI mapping exercise is a part of this long term process. Several training programs with the city managers are organized in cooperation with CITYNET, Tokyo Development Learning Center (TDLC) of the World Bank, UN ISDR, SEEDS and other partners. In 2010, a blended learning program was organized for 3 months, using online self training, face to face workshops, and video conference. This was found to be useful. The key challenge in the whole process is to keep the motivation of the cities to undertake decisive actions to enhance resilience. Periodic monitoring by the regional network organizations like CITYNET and/or local academic organizations is found to be useful.

Need for Further Actions

As a part of future actions, additional training programs of city managers are considered. Also, high profile Mayor's roundtable is required to enhance city decisional maker's perception on the problem, and enhance their willingness and motivation to take decisive actions. United Nations International Strategy for Disaster Reduction (UN ISDR) has announced 2010-2011 as the 2 years campaign for Safer Cities. Under the slogan "My City is Getting Ready", the aim is to promote the concept of disaster resilient cities. Hope, additional momentum will be gained during this two year campaign.

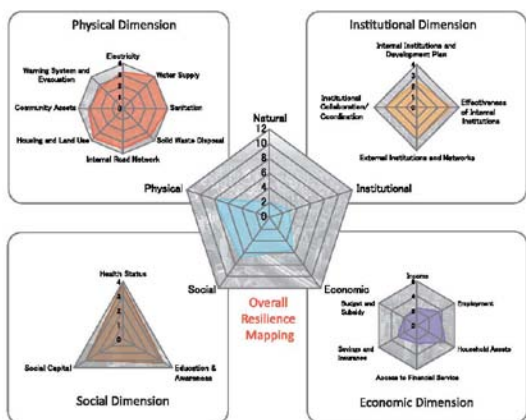


Figure 2. A typical city analysis

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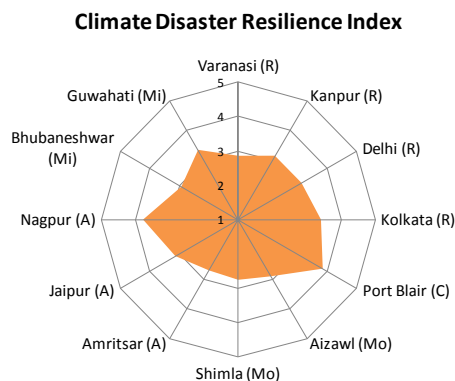


Figure 3. India city profile