Development of an Integrated Climate Change Impact Assessment Tool for Urban Policy Makers (UrbanCLIM)

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Project Objectives

- Develop high resolution climate change projections based on regional climate model (RCM) output from RMIP3.
- Develop an integrated impact assessment system including the major sectors in urban areas through working closely with the urban policy makers and planners, based on the co-evolutionary decision support system FAWSIM and SimCLIM software package applying system dynamics approaches.
- Conduct a training workshop, disseminate results and publish papers (during the latter stages).

Work Undertaken

A joint project workshop funded by APN and Monsoon Asia Integrated Regional Study (MAIRS) "Development of an integrated climate change impact assessment tool for urban policy makers (UrbanCLIM)," was held in Jinan University, Guangzhou, China, 29–31 October 2012.

This workshop was the first of three in this three-year APN project. More than 30 experts from the following institutions shared their research and application experiences: the International Global Change Institute (IGCI) New Zealand, MAIRS IPO, Institute of Atmospheric Physics (IAP, CAS); Nanjing University; Jinan University; Center for Water Resources Investigation and Planning, MONRE, Viet Nam; USC-Water Resources Center Foundation Inc. Talamban, Cebu City, Philippines; Institute of Geography and Natural Resource (IGNRR, CAS); Centre of Urban Planning Research, Guangzhou Urban Planning & Design Survey Institute, Guangzhou (GZPI), China; State Key Laboratory of Tropical Oceanography, South China Sea Institute of Oceanology (SCSIO, CAS); Guangzhou Institute of Energy Conversion (GIEC, CAS); Southeast Asia START Regional Center, Chulalongkorn University, Thailand; Department of Geography, University of Delhi, India; Department of Atmospheric Sciences, Yonsei University, Republic of Korea.

Presentations covered many themes around climate change risks and adaptation, including urban planning and governance, tools and modelling, Regional Climate Model intercomparison, water resources management, adaptation and mitigation synergy, coastal ocean environment, and freshwater lake environmental modelling. In the third day of the workshop, APN project leader Dr. Yinpeng Li, Dr. Ailikun of MAIRS IPO and key collaborators visited Guangzhou Planning Institute and conducted a seminar with its planners so that they might better understand how UrbanCLIM could assist with planning practice. The action plan for the coming year was discussed and action items were decided.

UrbanCLIM Platform Development and Features

The UrbanCLIM features were described as follow:
- Modular design to build on and link to existing models and related applications;
- Integrated analysis enabling testing of adaptation and mitigation options against socioeconomic

PROJECT SUMMARY

This project aims to develop a co-evolutionary urban climate change decision support system (UrbanCLIM), to support climate change impact and risk assessment for the major sectors: health, transport and water. A participatory assessment approach will be applied through working with local urban policy makers and planners. The UrbanCLIM platform was built on the system dynamics simulation library, and was designed to support layered applications. The central layer of the system provides the fundamental scientific understanding of climate change and related issues, the graphical user interface (GUI) and the model development environment. UrbanCLIM will allow "in-flight" alteration of models and their data and presentations, the use of a visual coupling tool for data conversion, and dynamic updating of workflows. A series of climate change impact models (flood, storm surge, heat waves and other impact models identified during the project) and cost-benefit analysis tools for adaptation analysis will be developed and incorporated in the UrbanCLIM system. Case studies and capacity building activities will be carried out in China and Viet Nam.

drivers, likely sectoral impacts, and existing goals for sustainable development;

- An open framework, allowing for multi-scale and multi-disciplinary impact assessment, which can be customized case-by-case to suit each city;
- Climate change uncertainty analysis building on GCM and RCM climate change scenarios;
- GIS interoperability;
- Visualization and further analysis options for the assessment of results; and
- Integration of risk and cost-benefit analysis tools.

UrbanCLIM also emphasized on user experiences, including:

- **Step-by-step navigation**. A featured window navigator is provided to support the fundamental understanding of climate change and local climate change context as well as a description of the case studies and demo models in simple language.
- **Model-building and running**. Users can drag "blocks" from the menu for categorized libraries to the canvas, then configure and link the blocks according to the model workflow. The model can be run by clicking the "run" button, and can be paused/stopped during the run.
- **Customizing models**. Users can place their own logos on the canvas, embed documentation in the block, or change the look of the custom function blocks.

- **State-of-the-art visualization tools**. ESRI MapControl and WPF chart control features are embedded, meaning the user can generate high quality visualization of model outputs easily in GENIES.

Project Publications

Li Y., Urich P., Yin C., Dooley M., Bosch, P., & Shah, J. (2012). From GCM/RCM Raw Data to User Experience: Towards an Extendable Decision Support System for Urban Planning, NCCARF Climate Adaptation in Action 2012 Conference, Melbourne 26–28 June 2012.

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PROJECT TITLE

Development of an Integrated Climate Change Impact Assessment Tool for Urban Policy Makers (UrbanCLIM)

COUNTRIES INVOLVED

China, New Zealand, Philippines, Viet Nam

PROJECT DURATION

3 years

APN FUNDING

US$ 135,000

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