

An aerial photograph of a mountainous region. In the foreground, there are terraced agricultural fields, some of which are green and others brown. A small village with several buildings is visible on the right side. The background features steep, forested mountains under a cloudy sky.

APN Focussed Activity:

# SCIENTIFIC CAPACITY BUILDING FOR CLIMATE IMPACT AND VULNERABILITY ASSESSMENTS (SCBCIA)

Asia-Pacific Network for  
Global Change Research



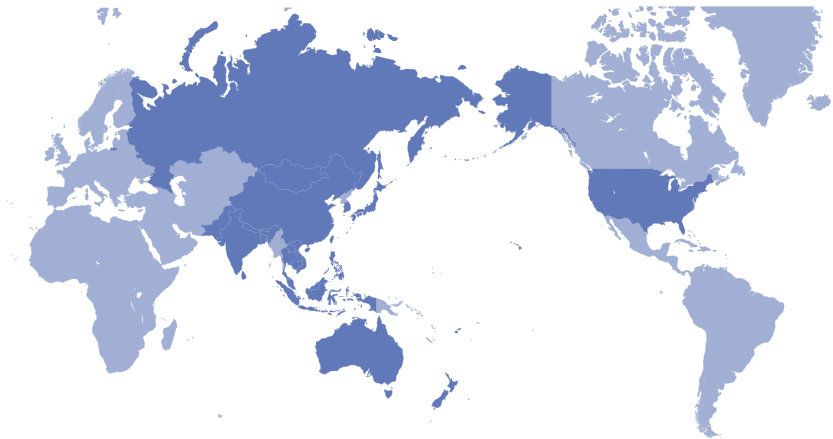
## APN at a glance

The Asia-Pacific Network for Global Change Research (APN) is a network of member country governments that promotes global change research in the region, increases developing country involvement in that research, and strengthens interactions between the science community and policy-makers.

Identify, explain and predict changes in the context of both natural and anthropogenic forcing

Assess potential regional and global vulnerability of natural and human systems

Contribute, from the science perspective, to the development of policy options for responses to global change



## Membership

From 12 countries in 1996, the APN's membership has grown to the current 22 member countries: Australia, Bangladesh, Bhutan, Cambodia, China, Fiji, India, Indonesia, Japan, Lao People's Democratic Republic, Malaysia, Mongolia, Nepal, New Zealand, Pakistan, Philippines, Republic of Korea, Russian Federation, Sri Lanka, Thailand, United States of America, and Viet Nam.

**1996**

Year of establishment

**22**

Number of Member Countries as of 2012

**3,422,000**

Financial resources for projects and other activities (2011/2012, USD)

Individuals and organisations in Pacific Island States and Singapore are able to participate in all APN programme activities and are considered to be from an APN Approved Country under the programme participation criterion.

## Core activities

### **Annual Regional Call for Research Proposals Programme (ARCP)**

Launched in April 1998 as a competitive process to select projects for funding under the Science Agenda of the APN, the Annual Regional Call for Research Proposals Programme (ARCP) is the main scientific pillar of the APN to encourage and promote global change research in the Asia-Pacific region that has potential, in addition to improving the understanding of global change and its implications in the region, to contribute to the establishment of a sound scientific basis for policy-making with regard to issues for which global change is an important factor.

### **Focussed activity: SCBCIA**

The IPCC AR4 notes that, in terms of the distribution of impacts and vulnerabilities to climate change, there are sharp differences across regions, and those in the weakest economic position are often the most vulnerable to climate change and the risks it presents.

Many countries lack the scientific capacity to be able to conduct crucial impact and vulnerability assessments in order to make informed decisions on how best to reduce the risks

### **Scientific Capacity Development Programme (CAPaBLE)**

The Scientific Capacity Building/Enhancement for Sustainable Development in Developing Countries programme (CAPaBLE), which was launched in April 2003, is an initiative to realise parts 107 to 114 of the Johannesburg Plan of Implementation (JPOI) for the World Summit on Sustainable Development (WSSD) and is registered as a WSSD Type II Partnership Initiative.

associated with climate change.

In this context, the APN launched a Special Call for Proposals for Scientific Capacity Building for Climate Impact and Vulnerability Assessments (SCBCIA) in September 2009, under its CAPaBLE programme, to address the urgent scientific capacity needs of developing countries in the Asia-Pacific region who are particularly vulnerable to the adverse effects of climate change.



# Climate Change Vulnerability Assessment and Urban Development Planning for Asian Coastal Cities

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As noted in an OECD report, approximately half of the total global urban coastal population threatened by coastal flooding and storm surges is located in just ten cities, nine of which are located in Asia: Kolkata (Calcutta), Mumbai, Dhaka, Guangzhou, Ho Chi Minh City, Shanghai, Bangkok, Rangoon (Myanmar), and Hai Phong (Vietnam).

The increasing physical risks and exposure of infrastructure and population is increasing the likelihood of “city-scale disasters” with substantial loss of life and infrastructure, and of damage as well to the national and regional economies in which these mega-cities play a key role. The UNISDR (2009) has recently stated that “it is paramount that risk reduction becomes part and parcel of urban planning,” which unfortunately is not the case at present.

With APN funding under the SCBCIA programme, an expert team from the Global Change System for Analysis, Research, and Training (START) and globally renowned institutions organized a workshop among city team and international expert partners to address the limited analytic capacity to carry out risk and vulnerability assessment in most Asian coastal cities.



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



Key information/knowledge gaps and proposed research identified by the cities were placed in three main categories:

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

**Category 2:** Information/knowledge management (need for data systems, GIS and mapping tools, and early warning systems)

**Category 3:** Governance (need for institutional mechanisms, coordination between government

agencies, NGOs and the private sector; and the sustainability of initiatives)

The workshop proved very effective and productive for participants and organisers. Key outputs of the meeting were the identification of potential future research opportunities and further development of city research networks. Notably, two proposed projects addressing climate change risk and adaptation are expected to commence in the near future, offering the potential for further collaboration with workshop participants.



**Project leader:** Dr. Anond Snidvongs, Southeast Asia, (SEA) Global Change System for Analysis, Research, and Training (START) Regional Center, Chulalongkorn University, Thailand

# Capacity Development on Integration of Science and Local Knowledge for Climate Change Impacts and Vulnerability Assessments



## PROJECT BACKGROUND

The reality of climate change calls for the understanding of how it might affect a range of natural and social systems, and to identify and evaluate options to respond to these effects (Ionescu et al., 2009). This has led to in-depth investigation of vulnerability and adaptation to climate change, which has become central to climate science, policy and practice.

The capacity, however, to conduct vulnerability and adaptation assessments is still limited in the Philippines, particularly with gaps in downscaling simulated scenarios and mainstreaming research findings

into policy- and decision-making processes (Sajise 2010).

With the decentralization policy, the Philippines local government units (LGUs), particularly at the provincial level, are at the forefront of action to respond to climate change impacts and risks.

It is therefore necessary to capacitate them on how to conduct climate change impacts and vulnerability assessments in their respective jurisdictions to enhance their preparedness strategies.

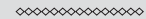
Hence, this capacity development project proposed to train key stakeholders in Albay, the Philippines to conduct impact, vulnerability and adaptation assessments using a computer-based modeling system 'SimCLIM' and participatory approaches.

## OBJECTIVES

- \* Familiarize relevant stakeholders in Albay on the concepts of climate change;
- \* Train the target audience, particularly the municipal planning development officers, on the use of SimCLIM customized for Albay (AlbayClim);
- \* Introduce participatory approaches for assessing climate change impacts, vulnerability and adaptation;
- \* Demonstrate, using case



## KEY RESULTS



**Project Leader:** Dr. Juan Pulhin, Department of Forestry and Forest Governance, College of Forestry and Natural Resource, University of the Philippines Los Baños, Philippines

- studies, vulnerability, impact and adaptation assessments to climate change and sea-level rise in selected areas in the province using a participatory approach and a computer-based modeling system (AlbayClim); and
- \* Investigate how to mainstream assessment results into adaptation planning processes.
- \* *Greater understanding* of the concept of climate change by local stakeholders;
- \* *Increased local capacity* to conduct vulnerability and adaptation assessments;
- \* AlbayClim, a *customized SimCLIM modelling system* for Albay province, was developed by partners from CLIMsystems;
- \* *Training* on the use of AlbyClim was conducted for planning development officers and local governmental staff from the Albay province;
- \* *Local knowledge* was integrated in the impact and vulnerability assessments;
- \* Contributed to the establishment of a *Climate Change Academy* in the province;
- \* Provided direct input to the revision of Albay's *Comprehensive Land Use Plan*; and
- \* Contributed to the Climate Change Commission process on *promoting a climate-resilient Philippines*.

# Climate Change in Eastern Himalayas:

Advancing Community-Based Scientific Capacity to Support Climate Change Adaptation

## PROJECT BACKGROUND

The Eastern Himalayas in the Yunnan province of China is a hotspot for biological and cultural diversity. In recent years, climate change impacts have increasingly threatened traditional communities, agro-pastoral livelihoods and surrounding mountain ecosystems.

According to a 2007 study by the Centre for Tibetan Region Sustainable Development (CTRSD) of Yunnan Academy of Social Sciences (YASS), the climate change not only threatens biodiversity and local livelihoods,

but also affects local knowledge and traditions. Traditional knowledge reflects local values to adapt to climate change and can provide important information for decision-making if it is combined with scientific methodology.

To complement earlier work, there is a crucial need to study the strategic and scientific approaches with an input of indigenous knowledge to climate change vulnerability assessments. As a described 'white spot' in terms of lack of

data in the IPCC AR4 report, the Himalayan region lacks much-needed assessments. In response, a team of multi-disciplinary experts proposed to support data collection involving local Tibetans and their traditional knowledge to contribute to global climate change assessments and to contribute to decision-making and science-policy interfacing. Thereby, it aims to set a benchmark for incorporating indigenous knowledge into the contributions from China to international assessments.







## OBJECTIVES

- \* Develop the capacity of climate scientists, local government officers, and multidisciplinary NGOs to contribute to the extension, application and diffusion of knowledge related to climate change impact and vulnerability assessments;
- \* Allow the project stakeholders to develop a locally tailored training programme in climate change impact and vulnerability assessments, hence contributing to sustained capacity building beyond the life of the current project;
- \* Organize a project meeting to share information, knowledge and experience on: (a) collaboration of indigenous knowledge with mainstream science; (b) scientific capacity building in climate vulnerability and impact assessments in China; and (c) establish best practices in interfacing indigenous knowledge with international global change policy;
- \* Advocate recommendations and advice to relevant international assessments and conventions on the scientific and socio-economic aspects of climate change impacts and vulnerability in the Eastern-Tibetan Himalayan region of North-West Yunnan Province, China; and
- \* Enhance cooperation and communication between the project team, NGOs, government bodies, and international global environmental change organisations, and general climate change awareness among public groups and civil society.



## KEY RESULTS

- \* Developed a link between scientists, local communities and government officials;
- \* Enhanced capacity of young scientists by engaging university students in scientific data collection, policy analysis, field research and communication activities; and
- \* Collected over 200 plant samples at high (above 3500 m), middle (2500–3500 m) and low (below 2500 m) altitudes.
- \* **Publications:**
  - » Local Knowledge on Climate Change—a case study of a Tibetan village in Northwest Yunnan, China
  - » Changing of Agro-pastoralist Livelihood in NW Yunnan, China: Impact of and Response to Climate Change
  - » Gender Mainstreaming and Climate Change—a Case Study of Eastern Himalaya, SW Yunnan, China
  - » China Culture and Environment (Chinese), Yunnan Publishing House, 2010
  - » Climate Change and Indigenous Knowledge, Yunnan Technology Publishing House (in print)



## Increasing Capacity of Local Scientists for Climate Change Impact and Vulnerability Assessments in Indonesia Archipelagos: Training in *In-Situ*/ Satellite Sea Level Measurements

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### PROJECT BACKGROUND

The Ministry of Fisheries and Marine Affairs of Indonesia predicts that more than 2000 small islands are at high risk of inundation due to sea level rise (SLR), which is a major impact of climate change. In order to assess the impacts and vulnerability of coastal zones, it is of critical importance to properly measure and monitor SLR. However, Indonesia lacks the necessary skills, trained human resources, and facilities, specifically

in the field of sea level measurement and Geographical Information System (GIS) analysis. Indonesian scientists studying marine science and technology are poorly equipped with the skills required to measure sea level and to assess the vulnerability of Indonesia's coastal zones.

In response to the current situation, a team from Bogor Agricultural University, Indonesia proposed a one-

year project of capacity development activities for local scientists and policy-makers in collaboration with experts from world-renown institutions as well as Indonesian national research institutions.

Project Leader: Dr. Jonson Lumban Gaol, Department of Marine Science and Technology, Bogor Agricultural University, Indonesia.

- \* Develop the capacity of Indonesian scientists to process and analyze sea level rise (SLR) data and conduct coastal vulnerability assessment in local areas;
- \* Raise awareness of Indonesian local scientists and policy-makers on the impacts of SLR in the coastal zone; and
- \* Contribute to a better understanding among Indonesian scientists and policy-makers on SLR impacts in the coastal zone for planning mitigation and adaptation activities.

## OBJECTIVES

## KEY RESULTS

- \* 30 Indonesian local scientists benefited from the training;
- \* Upon completion of the training, each participant worked on home assignments in their respective local areas;
- \* Three training modules for satellite SLR data processing, coastal inundation analyses, and coastal vulnerability index with GIS, were developed respectively; and
- \* Science-policy linkages were forged by engaging national policy-makers responsible for adaptation and mitigation.

## \* Publications:

- » Module of Training: In-situ/ Satellite Sealevel Measurement. 2010. Department of Marine Science and Technology, Bogor Agricultural University.
- » Proceedings of Workshop on *In-situ*/Satellite Sealevel Measurement. 2010. Department of Marine Science and Technology, Bogor Agricultural University.
- » Leben, R. R and J. L. Gaol. Training Workshop on Vulnerability Assessment of the Indonesian Archipelago to Climate Change. Presented at 2010 Ocean Surface Topography Science Team (OST-ST) Meeting in Lisbon Portugal.





# Building Research Capacity on Assessing Community Livelihood Vulnerability to Climate Change Impacts in Central Viet Nam and the Mekong River Delta

## PROJECT BACKGROUND

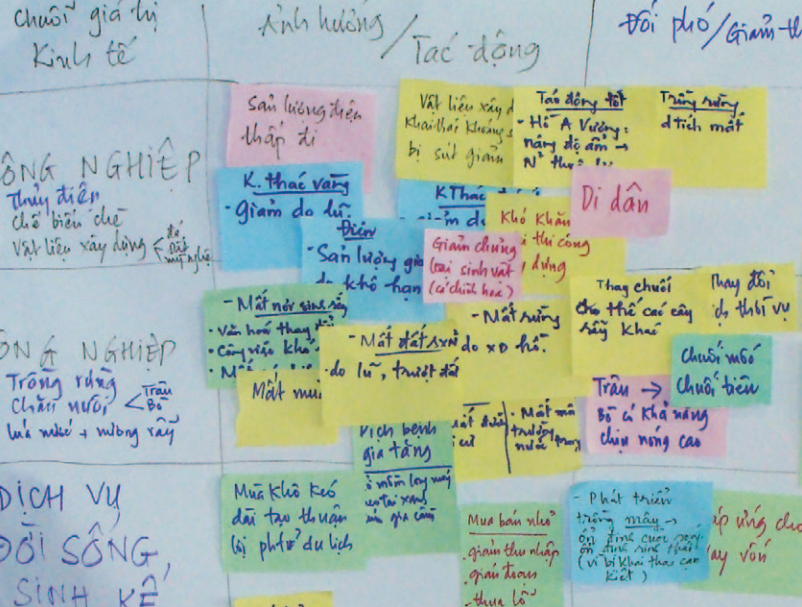
As one of the most vulnerable countries to climate change impacts, Viet Nam needs extensive studies and assessments on risk, vulnerability and adaptation to climate change. However, with limited scientific capacity, existing assessment work focusses only at sectoral levels, without taking local communities into consideration.

Specific assessments need to focus on local communities in vulnerable

areas and consider the local context where communities' livelihoods are at risk due to climate change impacts. Such assessment work can help policy-makers plan properly for community-based adaptation to climate change. Based on long-term experience in Southeast Asia, the START Regional Centre project team engaged two groups of researchers from Can Tho University and Nong Lam University, Viet Nam.

## OBJECTIVES

- \* Develop and enhance research capacity of two newly established research centres hosted at two universities in Viet Nam. The local institutions are expected to gain experience on the use of climate projection data to assess climate change risk of key sectors; and
- \* Understand the integrated approach of assessing the vulnerability of community livelihood to impacts of climate change.



## KEY RESULTS

- \* Enhanced research capacity in climate change vulnerability and adaptation assessments;
- \* Raised public awareness on climate change issues in a local context by engaging local stakeholders in the assessment process;
- \* Raised awareness on the concept of integrated assessment, which helped improve research capacity on climate change studies in the two newly established research centres; and
- \* Developed knowledge-base can be used as a foundation for developing science-policy dialogues in mainstreaming climate change into rural development plans in the future;
- \* **Publications:**
  - » Chinvanno, S., Le Anh Tuan and Nguyen Kim Loi, 2011. Assessing Climate Change Impact and Risk in Viet Nam: The initial pilot study in Mekong River Delta and central Viet Nam. Bangkok: Southeast Asia START Regional Center Technical Report. (In print)

# Capacity Development for Adaptation to Climate Change in the Rural Coastal Zone of Viet Nam

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## PROJECT BACKGROUND

According to a World Bank report, Viet Nam is the one

of most vulnerable countries under climate change impacts and faces a tremendous challenge of urban development to cope with emerging risks. However, existing research studies in Viet Nam focus mainly in cities, and there is a need to investigate climate change impacts and vulnerabilities in rural coastal

areas. As local communities and authorities play an important role in developing and implementing adaptation measures to climate change in rural coastal areas, it is vital to develop capacities of local experts, decision-makers and communities. In response, a team of Vietnamese and Japanese scientists proposed a comprehensive capacity development project focusing on rural coastal zones.

## OBJECTIVES

- \* Help local authority and residents to know about risks of climate change and to initiate adaptation activities to climate change;
- \* Review the effectiveness of available coastal engineering measures and help to propose suitable measures for smart adaptation to climate change in rural coastal areas; and
- \* Contribute to graduate education on climate change in Hanoi University of Science.

## KEY RESULTS

- \* Workshops developed capacities of 43 young scientists and advocated public awareness on climate change issues, risks and vulnerability to 49 local policy-makers;
- \* Workshop outcomes were used to develop curricula for graduate programmes on Climate Change Adaptation and Geo-Environment and Geo-Hazards in Hanoi University of Science;
- \* The project team collected and synthesized relevant information and data contributed from Hai Hau rural coast, with which potential impacts of various scenarios of sea level rise were assessed; and
- \* Involving international experts, the workshops provided good references for a master programme on Climate Change in Vietnam National University, Hanoi.
- \* **Publications:**
  - » Do Minh Duc, 2010. Coastal Protection in the Context of Climate Change: A Case Study of Hai Hau Coast. Vietnam Geotechnical Journal (English Series).
  - » Do Minh Duc, Mai Trong Nhuan, and Chu Van Ngoi, 2011. An Analysis of Coastal Erosion in the Tropical Rapid Accretion Delta of the Red River, Vietnam. Journal of Asian Earth Sciences.



## PROJECT BACKGROUND

Rapid and intense climate change is likely to delay progress towards achieving development targets such as the Millennium Development Goals in developing countries. Pakistan falls among the list of developing countries whose population's health is most likely to suffer harm from environmental hazards and health professionals have not come to the climate change debate. However, as impacts of climate change on health vary according to the geography of the area and the overall vulnerability of the local population therefore, as a first step an assessment of the nature and extent of risk that

climate change poses for the health of people of Pakistan is imperative. Any definitive conclusions about the country's capabilities and recommendations for practical or policy measures need to be based on such an investigation. In view of this and in line with the fact that in Pakistan the area of Climate Change and Human Health is relatively under-developed as a formal research arena; the project aimed at bringing a change in the status quo by strengthening capacities of health professionals for research on negative health impacts of climate change.



# Capacity Development of the Scientific Community for Assessing the Health Impacts of Climate Change

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## OBJECTIVES

- \* Stimulate the interest of health professionals in the relationship between the direct as well as indirect effects of global climate change on human health;
- \* Build their capacities for exploring, analyzing and assessing the same;
- \* Add to the relatively meagre resource of research work on the health impacts of climate change; and
- \* Contribute to the formation of a critical mass of trained researchers working in the climate change-health arena.

- \* The first workshop enhanced participants' understanding of the climate change phenomena at the global level and built their capacity for analyzing and evaluating the corresponding impacts of climate change on human health;
- \* The second workshop assisted in conducting much-needed vulnerability and impact assessments in the under-explored area of climate change and health;
- \* The third workshop, organized as an international training in Port Elizabeth, South Africa, in collaboration with LEAD International and LEAD South Africa, brought together professionals in different areas from across the globe to learn and share knowledge through a combination of case studies,

## KEY RESULTS

- skills modules and interactive sessions. The relationship between climate change and health was one of the thematic areas covered;
- \* Four research papers were put together, compiled and published under the title, 'Climate Change and Health — Exploring Linkages'; and
- \* Findings of these research papers were taken to decision-makers in the Ministry of Health. They were briefed about the research findings and copies of the report were provided to them for reference and record.
- \* **Publication:**
  - » Climate Change and Health — Exploring Linkages, 2011. LEAD Pakistan. ISBN 978-969-8529-59-8

Project Leader: Ms. Hina Lotia, Leadership for Environment and Development (LEAD), Islamabad, Pakistan

## APN Scientific Planning Group (SPG) Representatives

The SPG Members recommend a scientific programme including proposals for priority of funding and allocation of current available funding for consideration by the Inter-Governmental Meeting (IGM); works with the Steering Committee and the Secretariat in arranging scientific programme activities; and interacts on the APN's behalf with other international research programmes on global change. SPG Members also interact with the national Focal Point of their respective countries, the Secretariat, and the national and global change communities.

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**Scientific Capacity Building for Climate Impact and Vulnerability Assessments (SCBCIA)**

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Full final reports of APN projects highlighted in this brochure  
can be downloaded from the APN website at [www.apn-gcr.org](http://www.apn-gcr.org).

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Ministry for the  
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