

Asia-Pacific Network for Global Change Research

# PROJECT BULLETIN

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**APN**  
Asia-Pacific Network for Global Change Research

**APN Project Bulletin**  
**Volume 2, March 2007**  
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## Preface

The Asia-Pacific Network for Global Change Research is an international network of member governments whose mission is to enable investigation of change in the Earth's life support systems as it occurs in the Asia-Pacific region to:

1. Identify, explain and predict changes in the context of both natural and anthropogenic forcing;
2. Assess potential regional and global vulnerability of natural and human systems; and
3. Contribute, from the science perspective, to the development of policy options for appropriate responses to global change that will also contribute to sustainable development.

Changes in the Earth system are clearly impacting the societies and economies of the countries within the Asia-Pacific region. These countries support more than half of the world's population. Recent research and supporting observations have provided new insights into some of these changes and their impacts, but have at the same time opened a number of new and challenging scientific issues and to promote and encourage regional cooperative research to address these. In doing so, the APN assures that the results of this research contribute to the development of a sound scientific base for decision- and policy-making related to issues for which global change is an important factor.

*As part of its dissemination activities, the present publication outlines abstracts of currently-funded activities in the APN under its Annual Regional Call for Proposals (ARCP) and its Capacity Development Programme, CAPaBLE.*

The APN supports and encourages the dissemination of the information contained in this publication and specifically notes that the potential results of the present research and capacity development activities can facilitate policy development relating to Global Change in the Asia-Pacific Region.

*This publication is also available on the APN website*  
[www.apn-gcr.org](http://www.apn-gcr.org)

Secretariat  
Asia-Pacific Network for Global Change Research (APN)

**Section One:  
Projects funded under the  
Annual Regional Call for Proposals  
(ARCP)**

## 1.1 ARCP2006-01CMY-Ohtani

**Project Title:** Standardization and Systematization of Carbon-Budget Observation in Asia Terrestrial Ecosystem Based on AsiaFlux Framework

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**APN Funding:** US\$ 25,000  
(US\$ 25,000 in 2005)

### Project Summary

The objectives of this project are to promote information exchange and improve the methodology in flux observation and data analysis to provide more reliable carbon budget data in Asian monsoon terrestrial ecosystems. Two AsiaFlux workshops were held: the first in August 2005 in Fujiyoshida, Japan and the second in November 2006 in Chiang Mai, Thailand. These workshops provided an excellent opportunity to exchange and share information on flux measurement and data analysis, and discuss a standardised method of flux observation. A technical manual summarising the new standard method on flux measurements was compiled to help promote the method in Asian countries. Using this manual as a textbook, the first AsiaFlux Training Course was carried out in August 2006 in Tsukuba, Japan. Furthermore, an inter-comparison of measurements was carried out by using data from different types of observation method (open- and closed-path system), and results showed a significant difference in CO<sub>2</sub> flux values. The results will be valuable in evaluating indexes for previously obtained data. Information gathered through this project will be useful in rebuilding an Asiaflux framework to enhance the general technical level of flux observations.



*Above:*  
Participants at  
the AsiaFlux  
workshop in  
Chiang Mai,  
Thailand

*Below:*  
Young scientists  
being trained on  
methods of flux  
observation and  
analysis

## 1.2 ARCP2006-02CMY-Marcotullio

**Project Title:** Application of the Human Ecosystems Model (HEM) to Urban Environmental Management in ASEAN

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**APN Funding:** US\$ 25,000 (US\$ 35,000 in 2005)

### Project Summary

Resolving environmental challenges experienced by cities in Asia demands new management approaches. The ecosystem approach to urban environmental management provides opportunities to uncover policy leverage points not always articulated in more traditional, sectoral engineering approaches. This project applies an integrated framework called the Human Ecosystems Model (HEM) to investigate the applicability of the ecosystem approach in relation to climate change impacts in developing cities in ASEAN. The HEM presents a way to examine the relationship between the major social, economic and biophysical elements responsible for the emergence of environmental challenges, and hence a roadmap for addressing harms and proposing effective actions that are locally appropriate. The model is used as a basis to create a capacity building tool for the application of the ecosystem approach for ASEAN urban environmental planning and projects. The expected outputs of this project include a capacity building tool for training city managers to use the HEM, guidelines on the basic principles of the HEM and how to identify policies through its application, and research papers on water challenges in ASEAN.

*Below: Breakout groups reviewing the application of HEM on water-related challenges in ASEAN cities*



### 1.3 ARCP2006-03CMY-Mitra

**Project Title:** Assessment of the Effect of High Particulate Pollutants on Pulmonary Health Status in Selected Mega-cities of South Asia

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**APN Funding:** US\$ 67,000 (US\$ 58,500 in 2005)

#### Project Summary

This project aims to investigate the impacts of high particulate matter on human respiratory health in selected mega-cities of South Asia where the particulate matter loading, in general, in ambient air is very high due to various anthropogenic activities. The urban air pollution impacts on human health have assumed significant importance in the South Asia region but available studies are few. Through this project, studies are carried out in selected mega-cities of South Asia, viz. Colombo, Delhi, Dhaka, Kathmandu, Kolkata and Lahore, by multi-disciplinary teams consisting of health and aerosol experts. The project teams developed common protocols for air quality sampling and health surveys both for acute and chronic symptoms. Guided by this protocol, air quality data was collected and analysed covering low, medium and high pollution periods in the target mega-cities, and a field surveys of the health status of target populations were carried out. Lung function tests of the selected survey population were also performed using spirometry and/or peak flow meters. Currently, the results are being synthesised and a science-policy workshop will be organised to disseminate the findings of the project.



Sampling of particulate matter and fine particulate matter in Delhi using High Volume Sampler (*above*) and Quartz Crystal Microbalance (*below*), respectively

## 1.4 ARCP2006-04CMY-Rajan

**Project Title:** Agriculture Land Use Policy in East and South Asia – Rapidly Changing Landscapes and Its Impacts on Regional Food Security and Its Future Scenario

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**APN Funding:** US\$ 22,500 (US\$ 30,000 in 2005)

### Project Summary

Agricultural land use changes have been quite dramatic in the last four decades, since the start of the green revolution, leading to intensive use of the land for food production. In South and East Asia, this growth has come from irrigated fields (multiple cropping), increased inputs and government policies. However, there are widespread disparities in productivity, environmental conditions and economic outputs across the region. Also, rapid economic development and demographic changes are resulting in accelerated land-use changes (structure and pattern) in this region, leading to large impacts on the environment, such as soil degradation. Potentially, good policies backed with good models are a major tool for sustained progress. The project focuses on understanding land use characteristics in the region and applies the AGENT-LUC land use model to develop a regional model that is able to take into account both meso- and micro-characteristics and help provide a tool for a more balanced policy to improve the food security in the region. The project is currently in its second year, and the following activities are being conducted: improving the interface of the model, model runs and modifications, model sensitivity checks and food security analysis. An International Symposium on Land Use Modelling is also planned in March 2007, in Hyderabad, India.

## 1.5 ARCP2006-05CMY-Akimoto

**Project Title:** Asian Ozone Pollution in Eurasian Perspective

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**APN Funding:** US\$ 37,000  
(US\$ 40,000 in 2005)

### Project Summary

This project synthesises surface ozone data in Asia in collaboration with existing networks and compiles the data from selected years in a database for the discussion of regional ozone pollution. The data will be analysed with the aid of global and regional chemical transport modelling to provide a solid scientific base for future ozone control policies in Asia including both developed and developing countries in the northern hemisphere. These goals will be accomplished through three workshops: the first on the presentation of observational data from each participating country, the second on the interpretation and discussion of the data together with modelling studies, and the third on integrating the obtained scientific knowledge on ozone pollution in Asia into policy. The first and second workshops were completed with the latter held in New Delhi, India on 30 October 2006. This event, entitled 2<sup>nd</sup> Symposium on Asian Ozone Pollution in European Perspective, brought together more than 50 participants including 10 students. Audits to three observation stations at Mt. Abu and Darjeeling in India and Tanah Rata, Malaysia were performed, and these were very fruitful in identifying and solving some problems at the stations. Two publications on modelling of regional high ozone episodes and analysis of the seasonal variation of ozone were also published in the *Atmospheric Environment* journal to disseminate the results of the project.



Above: APN participants and hosting staffs in front of the Bose Institute, Darjeeling, India

### Publications:

Wang, Z. *et al.* (2006). Modeling of regional high ozone episode observed at two mountain sites (Mt. Tai and Huang) in East Asia. *Atmos. Environ.*, 55 (3), 253-272.

Yamaji, K. *et al.* (2006). Analysis of the seasonal variation of ozone in the boundary layer in East Asia using the Community Multi-scale Air Quality Model: What controls surface ozone levels over Japan? *Atmos. Environ.*, 40/10, 1856-1868.

## 1.6 ARCP2006-06NMY-Ziegler

**Project Title:** Sediment Dynamics and Down-Stream Linkages in Tropical Streams as Affected by Projected Land-Cover/Land-Use and Climatic Change

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**APN Funding:** US\$ 40,000 (Year 2 expected funding: US\$ 40,000)

### Project Summary

The proposed research increases the understanding of how water quality in headwater streams in Montane Mainland Southeast Asia will be affected by plausible changes in both climate and land-cover/land-use. The goals of the project are two-fold: 1) to investigate the issue successfully during a field study in Thailand; and 2) to develop the capacity to conduct similar projects in China, India and Viet Nam. The Thailand field study, with the Mae Sa River Basin as the study site, will coordinate with an on-going NASA-funded investigation of the role of land-cover change in altering regional hydrological processes under a changing climate. Using the sediment dynamics and down-stream linkage data to be collected, it will attempt to distinguish the degree that various types of anthropogenic change will affect erosion, sediment delivery and water quality. The project will generate new data regarding the potential effects of climate change, which is important for developing sound mitigation strategies, as well as determining non-linear vulnerabilities of natural and human systems. The knowledge generated will be transferred to officials who make policy related to sustainability in the region. Sampling was already conducted during the 4 wet-season and 2 dry-season months at the Mae Sa River Basin. Some delays have occurred owing to the destruction of monitoring equipment during flashflood events in 2006, but these problems will be resolved in early 2007. Potential project sites in China and India have already been found for the implementation of the sediment dynamics study.

## 1.7 ARCP2006-07NMY-Koike

**Project Title:** The International Integrated Data Access and Transfer in Asia (IIDATA) Project

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**APN Funding:** US\$ 43,000 (Year 2 expected funding: US\$ 43,000)

### Project Summary

This project focuses on the Asian water cycle variability within the context of a global climate and the impact of this variability on water resources. It aims to 1) improve knowledge and enhance prediction of the Asian water cycle variation and its impacts on water resources through integrated observation systems and advanced data management and processing capabilities, and 2) support informed decisions on water resources management and promote integrated water resources management (IWRM) strategies. An International Task Team (IIT) was formed to discuss the data policies and to outline the implementation strategy. It was proposed to have demonstration projects (DP) that would show the value of the global integrated data sets for advancing research into the water cycle and for implementing IWRM strategies through the actual application of the available data to selected basins in participating countries. These DPs were introduced at the 2<sup>nd</sup> Asian Water Cycle Symposium held in Tokyo, Japan on 9-10 January 2007. The baseline of the Asian Water Cycle Initiative implementation plan and the data policy were also discussed, modified and endorsed by the participants at the symposium.



*Above: 2<sup>nd</sup> Asian Water Cycle Symposium participants*

## 1.8 ARCP2006-08NMY-Nadaoka

**Project Title:** Integrating Support System for Managing Environmental Change and Human Impact on Tropical Coastal Ecosystems in East Asia and the Pacific

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**APN Funding:** US\$ 56,500  
(over two years)

### Project Summary

Coastal zones in East Asia and the Pacific (mostly archipelagic or small island countries) are extremely vulnerable to disturbances associated with natural climate variability coupled with anthropogenic forcing. Increased environmental loads from adjacent watersheds are of particular concern because of their deleterious effects on coastal habitats. However, information and corresponding analysis tools crucial for management and decision-making are still far from ideal, and the numerous research and monitoring programs involved in data acquisition mostly target marine, coastal, or terrestrial environments and communities or any combination, but rarely encompass all. This project aims to strengthen present and future coastal observational (in-situ and space-based) and modelling capabilities and decision-making process by developing a region-wide, collaborative strategy for data exchange and analysis among coastal scientists and managers. It envisions the production of user-friendly tools capable of hind-casting development patterns and for building scenarios to explore various management options. Project activities have commenced covering both the physical-chemical-biological and the socio-economic aspects of the coastal environment, and a workshop was conducted in Fiji to discuss standardised methods on data processing.



*Above:*  
Professors Zann  
and Nadaoka  
discussing with  
participants the  
system's  
approach to  
research and  
management in  
Fiji's coral reefs

## 1.9 ARCP2006-09NMY-David

**Project Title:** Integrating Vulnerability Assessment of Coastal Areas in the Southeast Asian and East Asian Region

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**APN Funding:** US\$ 80,000 (over three years)

### Project Summary

Despite the increasing amount of scientific research on global environmental change (GEC) and its potential impacts on coastal areas, there are still considerable gaps in our knowledge on how multiple biogeographical and anthropogenic processes interact to create risk. A regional collaborative effort is proposed to address this problem focusing on the risk potential in coastal areas in the Southeast Asian and East Asian regions. The influence of the complex and dynamic social, economic and environmental factors in these regions on the vulnerability of coastal communities to GEC including natural hazards need to be comprehensively assessed. The assessment should also include the ability of those affected to cope, recover and adapt to such changes and shocks. The goal of this project is to achieve an integrated analysis of these processes, their effects on human communities, and their implications for management and governance of coastal systems and adaptation capacities. The approach is to focus on training workshops which will expose the regional participants to available tools for assessment and bring together secondary and primary data obtained by scientists from collaborating countries. Further refinement of tools will be done as identified necessary. The guiding principle of the whole endeavour is to effectively influence policy- and decision-makers in the selection of strategic and sustainable adaptive measures to reduce the future impacts of GEC.

## 1.10 ARCP2006-10NMY-Lasco

**Project Title:** Linking Climate Change Adaptation to Sustainable Development in Southeast Asia

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**APN Funding:** US\$ 35,000 (over two years)

### Project Summary

Many countries in Asia are striving to achieve sustainable development, with almost 2 billion people living at less than US\$ 2 a day (ADB 2005). One of the factors that could hinder sustainable development efforts is climate change. However, the link between climate change adaptation and sustainable development is not explicitly recognized for a number of reasons. In many cases, the climate change community has little interaction with national development planners. As a result, mainstreaming of climate change adaptation in development efforts is making little headway. This study aims to help clarify the links between climate change adaptation and sustainable development. It will synthesise research on adaptation strategies for climate change and climate variability in Southeast Asian countries and analyse the links of these adaptation strategies to the sustainable development goals of the respective countries. By engaging the policy-maker community and other relevant stakeholders, the project hopes to contribute to the mainstreaming of climate change adaptation to the sustainable development agenda of Southeast Asian countries. Initial coordination with the collaborating countries is being undertaken by ICRAF-Philippines through setting up a project e-group.

## 1.11 ARCP2006-12NMY-Huda

**Project Title:** Climate and Crop Disease Risk Management: An International Initiative in the Asia-Pacific Region

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**APN Funding:** US\$ 35,000  
(Year 2 expected funding:  
US\$ 35,000)

### Project Summary

The project aims to secure regional integration of existing research in the areas of climate, crop, disease epidemiology, and food security through the development of predictive modelling capabilities for proactive risk management. The value of the approach is demonstrated via concurrent application to three index crops (peanut, canola and mustard) in selected areas, and the development of risk communication through engagement with local stakeholders. A range of eminent scientists are providing the required scientific and policy-analytical linkage. The project will develop environmentally friendly management strategies, including limited pesticide usage, thereby increasing sustainability while contributing to strategic food production. A scoping/planning workshop was held in Hyderabad, India, on 6-8 November 2006 to discuss major research interests, investigate opportunities for integrating existing work and future efforts to meet a common goal, and explore common ground between existing modelling for a range of relevant parameters. Potential models and the necessary modifications for successful model application were identified during the workshop. Following the workshop, the participants had an enhanced understanding of the relationships between weather/climate, disease incidence, and reduction in crop yield on a regional level.



*Above:*  
Participants at  
the project's  
scoping  
workshop in  
Hyderabad,  
India

## 1.12 ARCP2006-13NMY-Oanh

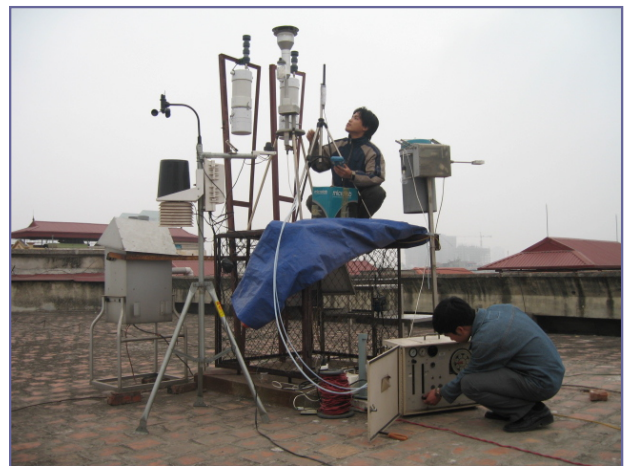
**Project Title:** Investigation on the Impacts of Urban-Rural Air Pollution on Air Quality and Climate in Southeast Asia

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**APN Funding:** US\$ 30,000 (Year 2 expected funding: US\$ 30,000)

### Project Summary

This research project is designed to characterise and evaluate the air pollution levels in selected countries in Southeast Asia with focus on particles and key gaseous pollutants. Two metropolitan regions are included, namely, Bangkok Metropolitan Region of Thailand and the Hanoi Metropolitan Region of Viet Nam. The goal of this study is to initiate measurements of the climate change-relevant properties of particles in the ambient air in the selected cities which can be further expanded to other countries in Asia. The data generated will be used to characterise the interaction between emission sources, air quality and climate in the region. Modelling tool will be used to identify major contributing sources of air pollution so that appropriate recommendations can be made to prioritise sources for control. The obtained information will be disseminated to public, scientific community and policy-makers through seminars, workshops and direct communication. The project started its sampling activities in Hanoi in January 2007, and preparation is on-going for online measurements in Bangkok.



*Above:*  
Particulate matter monitoring in Thuong Dinh, Hanoi, Viet Nam

### 1.13 ARCP2006-14NSY-Chen

**Project Title:** Workshop on “Global Water System Hotspots in the Asian Region: Mega Cities and Dams” – 2<sup>nd</sup> GWSP-Asia Network Meeting

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**APN Funding:** US\$ 24,000

#### Project Summary

The workshop on “Global Water System Hotspots in the Asian Region: Mega Cities and Dams” was organised by the School of Geography and Planning, Sun Yat-sen University (SYSU) and the International Project Office of the Global Water System Project (GWSP), and took place on 8-11 June 2006, in Guangzhou, China. The workshop was the follow-up of the 1<sup>st</sup> GWSP-Asia meeting held in Kyoto, Japan in 2005. The objectives of the meeting were to summarise the existing state of knowledge on current cumulative impacts of mega cities and that of dams in Asia and to set and launch a research agenda for mega cities and dams in Asia in the context of the global water system. About 40 participants from 12 countries attended the workshop. The workshop was made up of sessions for presentation and discussion, a discussion of follow-up activities, and an excursion. In addition to APN funding, the workshop was co-sponsored by the Chinese National Committee for GWSP, the Monsoon Asia Integrated Regional Study (MAIRS), the Research Institute for Humanity and Nature (RIHN), and the Land-Ocean Integration in the Coastal Zone (LOICZ). The main goals are considered well-achieved by the presentations, papers and databases introduced during the workshop.



*Above:*  
Participants of  
the 2<sup>nd</sup> GWSP-  
Asia Network  
Meeting

## 1.14 ARCP2006-15NMY-DeCosta

**Project Title:** Assessment and Management of Change in Coastal Zone Caused by Salinity Intrusion

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**APN Funding:** US\$ 44,000 (Year 2 expected funding: US\$ 26,000)

### Project Summary

Unmanaged extraction of ground water coupled with global warming, sea level rise, and tsunami after-effects have resulted in continuous change within fresh water bodies in coastal zones. Changes in water bodies directly relate to changes in catchments characteristics, which also interact with socio-economic changes. This research investigates changes in coastal zones caused by salinity intrusion, and covers both the catchments socio-economic trends and the water bodies. It will assess and predict the long term salinity intrusion situation, and then develop a simulation model that will actively link the changes in the catchments socio-economic trends to the changes in waters of adjacent coastal zones. Thereby it is envisaged to develop a model that would aid policy-makers to take optimal decisions with multiple objectives to manage the changes occurring in coastal zones including the water bodies, for causes such as global warming, post tsunami effects and planned withdrawal strategies. The following sites will be investigated: the Waiwhetu aquifer in Wellington, New Zealand; Bundaberg aquifer in Queensland, Australia; Goa and/or Andhra Pradesh in India; aquatic systems in the coastal zone of Sri Lanka; Ogawara Lake, Gono River and Izena Island in Japan; and the Indus basin in the Punjab and Sindh provinces in Pakistan.

**Section Two:  
Projects funded under the  
CAPaBLE Programme**

## 2.1 2005-CB02-NMY-Taniguchi

**Project Title:** Guidelines for Environmental Education Focusing on Environmental Ethics and the Human Dimensions of Global Change

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**APN Funding:** US\$ 70,000  
(over two years)

### Project Summary

Environmental education is considered as a major tool for sustainable development and is an interaction between the science community, policy-makers and those involved in the education sectors (primary, secondary and tertiary). This project aims to enhance the scientific educational capacity of developing countries in the Asia-Pacific region to incorporate environmental education and sustainability into their mainstream educational systems. It is directed towards making full use of participating countries' experience and knowledge of global change research; formulating guidelines for environmental education and sustainable development; and filling the existing gaps among teachers and other stakeholders involved. An international symposium, entitled "Establishing Guidelines for Environmental Education based on Environmental Ethics", was held in Kobe, Japan on 28-30 January 2006, to assist in the development and promotion of knowledge of natural science related to global change research. This was attended by 314 participants, with the aims to establish preliminary international guidelines for environmental education and establish initial partnerships in the Asia-Pacific region. A second international symposium is planned in April 2007 to be held in Malaysia. The outcomes of both symposia are expected to be used to formulate guidelines for the development of environmental education guidelines to suit the needs of countries in Asia.



*Above:*  
Demonstration of environmental education using on-line TV net system between Japan and Thailand

## 2.2 2005-CB04-CMY-Koshy

**Project Title:** Training Institute on Climate and Extreme Events in the Pacific

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**APN Funding:** US\$ 150,000 (over three years)

### Project Summary

The Kiribati Training Institute on Climate and Extreme Events (KTICEE) represented the third and final phase of a three-year training and capacity building project being undertaken jointly by the University of the South Pacific (USP), the East-West Center (EWC), and the National Institute of Water and Atmosphere (NIWA). The KTICEE was held from 21 July to 2 August 2006 in Tarawa, Kiribati, and aimed to educate participants about the impacts of climate change so that the population could anticipate problems and respond accordingly. The training provided local participants with tools to review and evaluate existing processes on climate change, and to develop and formulate informed policies and strategies to achieve changes to existing practices. The training was multi-disciplinary and therefore, it enhanced the knowledge of participants on climate change and about the challenges and requirements of four major relevant sectors in Kiribati – water, agriculture, fisheries and coasts – and of other relevant sectors such as the meteorological office, the finance ministry and the media. Through the workshop, a network was built among participants. Participants developed crosscutting strategies and as a starting point, drafted ideas for projects they could implement as long-term and short-term measures to mitigate and adapt to impacts of climate change.



*Above:*  
Participants at  
the training  
institute in  
Tarawa, Kiribati

## 2.3 2005-CB06-NMY-Ali

**Project Title:** Socio-economic Impact and Lessons Learning from the Management of Social Forestry Program Implemented in Bangladesh

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**APN Funding:** US\$ 20,000  
(over two years)

### Project Summary

Bangladesh is a densely populated country with scarcity of cultivable land. Therefore, marginal lands, such as road sides and slopes of roads, embankments, fallow/encroached land, and railways, have also been brought under participatory forestry for raising plantations to meet the increasing demand of the country as well as for ecological balance. Participatory forestry started in Bangladesh in 1981 which was implemented in the north and north-western part of the country covering 23 districts. Subsequently, two more participatory forestry projects were carried out, after which the government implemented a follow-up project known as extended social forestry for two years. Different approaches were employed in the social forestry program in the last three decades.

This project aims to investigate and analyse these approaches and identify the best approach for providing input to policy- and decision-making for sustainable development. Field work, surveys and a literature review were conducted and following the results of the initial interviews, the gains from the program were evident in terms of securing food and improving the livelihood of families. The program also helped reduce encroachment and theft, developed a sense of ownership from among the beneficiaries, and empowered women through increased participation.

Strip plantation  
(above) and  
woodlot  
plantation  
(below) sites  
under Social  
Forestry  
Program in  
Bangladesh



## 2.4 2005-CB07-NSY-Ieng

**Project Title:** Development of a 'Mobile Environmental Education Program' to Raise Awareness about Climate Change in Cambodia

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**APN Funding:** US\$ 40,000

### Project Summary

The Mobile Environmental Education Programme (MEEP) represents an innovative means to increase awareness about the causes and impacts of climate change in Cambodia. It targets groups such as policy-makers, students, Buddhist monk novices, civil servants, NGOs and tourists, who will have the greatest influence in developing and implementing Cambodia's response to climate change and environmental protection. The Tonle Sap Lake is the initial study site of the program, and a mobile education centre in the form of a purpose-built boat will be used by participants to visit communities located around the lake. Participants will experience the impacts of climate change and environmental degradation through all five senses, learn from examples of best practices in sustainable development and resource management for rural communities, and monitor the impacts of climate change by measuring and recording various indicators. It is planned that MEEP will be undertaken as a public-private partnership, and will increasingly become self-financing from participant fees. Funding under the CAPaBLE Programme is being used to develop a feasibility study and educational programme for the MEEP, making use of extensive community consultation. This study will subsequently be used as the basis for implementing an initial partnership. If successful, it is hoped that this will form the basis for similar future initiatives in Cambodia and regionally.



*Above: Primary schoolchildren as one of the target participants for the MEEP*

## 2.5 2005-CRP1CMY-Khan

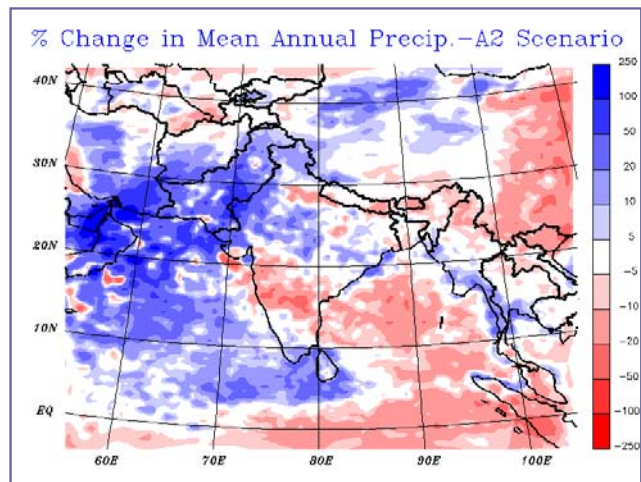
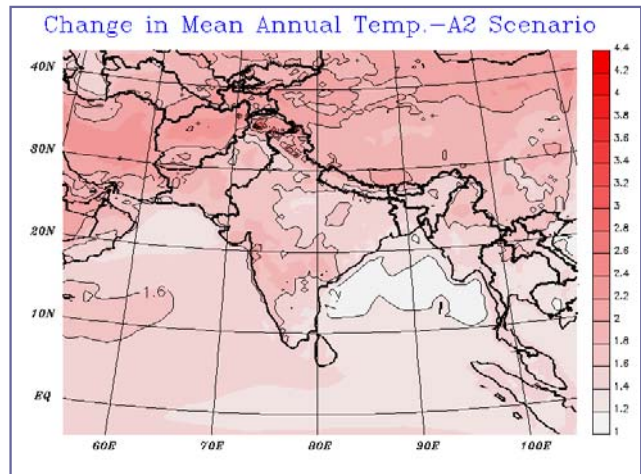
**Project Title:** Enhancement of National Capacities in the Application of Simulation Models for the Assessment of Climate Change and Its Impacts on Water Resources and Food and Agricultural Production

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**APN Funding:** US\$ 300,000  
(over three years)

### Project Summary

This project aims to develop the technical capacity of three South Asian countries, namely Bangladesh, Nepal and Pakistan, in climate change research, particularly in the development and use of mathematical models for assessment of the impacts of global climate change and the corresponding impacts on various socio-economic sectors of the respective countries. The models will also be applied in assessing the potential vulnerabilities of each country and exploring various options for adaptation. Statistical analysis of historical data for each country has been completed and country reports are being compiled based on these results. Training workshops have been conducted on Regional Climate Models (RCMs), Crop Simulation Models (CSMs), Watershed Simulation Models (WSMs), and Climate Scenario Development (CSD). Climate change scenarios have been developed for these three countries using an ensemble of six global change models. These are being downscaled to develop high resolution scenarios for the project countries.



Projected changes in mean annual temperature (in °C; *above*) and precipitation (in %; *below*) in South Asia region in 2050 obtained with RegCM3.

## 2.6 2005-CRP2CMY-Shukla

**Project Title:** Integrated Assessment Model for Developing Countries and Analysis of Mitigation Options and Sustainable Development Opportunities

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**APN Funding:** US\$ 300,000 (over three years)

### Project Summary

Jointly implemented by the Indian Institute of Management, India, Energy Research Institute, China, and Asian Institute of Technology, Thailand, this project aims to develop an Integrated Model from a developing country perspective for assessment of potential climate change mitigation and options in the context of national sustainable development priorities and policies. So far, it has achieved in developing a model and databases which can facilitate analysis of strategic mitigation options for developing countries.

Each partner has performed its country scenario and policy modelling in the context of national development plans and greenhouse gas mitigation. These are being disseminated through the project's website ([www.e2models.com](http://www.e2models.com)), which also displays intellectual resources related to project domain and serves as a channel for project coordination. The project outcomes are being interfaced with various international environmental assessments by the team members participating in activities such as the IPCC's Fourth Assessment Report (AR4), GEO 4, Asia-Pacific Environment Innovation Strategy (APEIS), and the Development and Climate project led by UNEP RISO Centre on Energy, Climate and Sustainable Development, Denmark.



*Above:*  
CAPaBLE  
workshop  
participants  
at ERI,  
Beijing, 6-7  
September  
2006

## 2.7 CBA2006-01NSY-Manner

**Project Title:** Capacity Building and Meeting Research Needs on the Ecology of Global Change in Island Landscapes of the Republic of Palau

**Project Leader:** Dr. Harley Manner

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**APN Funding:** US\$ 42,000

### Project Summary

The Pacific-Asia-Biodiversity Transect Network (PABITRA) is a program of the Ecosystem Division in the Pacific Science Association Task Force on Biodiversity. Its aim is to collaborate with resident Pacific Islanders on biodiversity research and ecosystem conservation. Its research strategies are: to encourage comparative studies across Oceania in ecosystems that belong to the same biomes (the horizontal strategy) and to study selected island landscapes from the mountains to the ocean (the vertical strategy). This capacity building project in Palau follows on two previous PABITRA capacity building workshops held in Fiji and Samoa and aims to train Palauan students and scientists in the methods of ecological analysis so that they can conduct the necessary studies and data collection that the country will need for policy development. An Initial Synthesis Meeting was held in Koror, Palau on 7-11 August 2006. A total of 26 local participants attended the meeting, and existing information and base data were brought together and the needs for new ecological approaches were clarified. A fieldtrip was also organized to Lake Ngardok wherein participants were shown how to recognise vegetation patterns (entitiation) and conducted a hands-on determination of the minimal plot size for a relevé in a seasonal swamp forest. A joint analysis workshop is planned in March 2007 for a capacity building activity on ecological biodiversity assessment.



*Above:*  
Participants  
at a fieldtrip  
in Ngardok  
Lake, Palau



## 2.9 CBA2006-03NSY-Sevilla

**Project Title:** Integrated Participatory Analysis of Sustainability in the Greater Mekong Sub-Region (GMS)

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**APN Funding:** US\$ 28,000

### Project Summary

The project trains young researchers and young professionals on methods and tools for analysing issues related to global change in an integrated and participatory way. The activities include: 1) an intensive training course; 2) policy dialogue (participatory support for problem structuring and awareness raising); and 3) dissemination (transfer of scientific knowledge to the policy sector and the public). Training is being conducted by internationally renowned experts in the fields of integrated analysis, participatory research, and sustainability research. Participants will be trained to engage in global change research by applying practical, problem-oriented, and policy-relevant approaches. The issues being dealt with in the project concern aspects of global change research, including land-use and land-cover change, food and water security, and agricultural practices. There is a clear emphasis on socio-economic drivers of global change on intervention in social systems for sustainable development. Participants shall be enabled to conduct and inform on sustainability research independently and identify relevant national sustainability issues and suggest research strategies to tackle these issues. Coordination for the conduct of the training has commenced, with the announcement disseminated via different channels. Agreement with the editors of the *Review of Cooperation and Development* and *International Journal of Global Environmental Issues* on the guest editorship of a special issue on Sustainable Development in the GMS has been achieved.

## 2.10 CBA2006-04NMY-Dharmaji

**Project Title:** Removing Barriers to Capacity Building in Least Developed Countries (LDCs): Transferring Tools and Methodologies for Managing Vulnerability and Adaptation to Climate Change

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**APN Funding:** US\$ 30,000  
(Year 2 expected funding: US\$ 30,000)

### Project Summary

The project aims to translate global thinking into local actions through building scientific capacities of local governments by way of transferring technologies and methods to various stakeholders for assessing vulnerability and adaptation to the global change process at local levels. A regional workshop was organized on 18-22 December 2006 in Hyderabad, India to build capacity and train policy-makers, researchers and NGOs from Bangladesh and Nepal in understanding issues and vulnerability and adaptation to changing climatic regimes. A comprehensive background material dealing with policy and technology issues related to climate change adaptation was prepared along with an Adaptation Resource Kit that was disseminated to all participants. The regional workshop laid emphasis on community-based adaptation approaches, encouraged ground level consultations and multi-stakeholder analyses to disseminate tools and technologies for vulnerability assessments through the sub-regional consultative workshop that was organised for LDC members in South Asia (Bangladesh and Nepal).



*Photos above:  
Training  
workshop on  
transferring  
tools and  
methodologies  
for managing  
vulnerability and  
adaptation to  
climate change*

## 2.11 CBA2006-05NMY-Aalbersberg

**Project Title:** Climate Change and Variability Implications on Biodiversity – Youth Scenario Simulations and Adaptation

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**APN Funding:** US\$ 35,000  
(Year 2 expected funding: US\$ 35,000)

### Project Summary

The Pacific Islands marine and terrestrial ecosystems have some of the most significant biological diversity in the world, where there are pristine ecosystems and habitats, some of which harbor endemic species. These unique habitats are under threat from the effects of climate change and variability, e.g. modification and/or loss of marine, coastal and terrestrial ecosystems will undermine local food and economic security. Pacific Island communities depend on these for their livelihood and maintaining their traditions and culture. This project will build regional, national and local capacity in climate change and variability implications on biodiversity. It is intended to raise policy-makers' and civil society awareness as well as to pilot adaptations in its Locally Managed Marine Area (LMMA) network resource management projects as a basis for scoping climatic implications on Pacific biodiversity and attempt to provide answers. A regional climate change workshop was held on 18-22 September 2006 in Suva, Fiji with 35 young participants from the region (Tuvalu, Solomon Islands and Fiji). The workshop aimed at building the capacity of youth in climate change, sustainable development, biodiversity, risk assessment and drama as a tool to address and raise awareness on climate change issues. The young participants were able to produce 4 songs, 4 drama scripts and 2 video documentaries as outputs of the workshop. They also returned to their respective communities with eagerness to commence with the next phase of the project.



*Above: Fiji youth dramatise forest habitat*

## 2.12 CBA2006-06NSY-Towprayoon

**Project Title:** Greenhouse Gas (GHG) and Aerosol Emissions under Different Vegetation and Land Use in the Mekong River Basin Sub-Region

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**APN Funding:** US\$ 30,000

### Project Summary

The mitigation of greenhouse gas and aerosol emissions from biogenic sources and biomass burning activities associated to different vegetation land use requires transfer of know-how to regional scientists to perform measurements and to establish appropriate emission inventories. This research focuses on measurement and evaluation of GHG and aerosols emissions from biogenic sources (paddy fields and forest) and biomass burning (rice residues), respectively, in selected sites in Thailand and in Cambodia. The calculation methodology for the estimation of GHG and aerosol emissions from biogenic sources and biomass burning activities, and the data required to perform these calculations have been retrieved from the literature. GIS maps of vegetation land use including forests and rice fields, and maps of vegetation forest hotspots have been collected for all countries of the River Mekong Basin Sub-region. Experimental procedures have also been set up for these activities. A training workshop for capacity building of the scientists and for disseminating scientific information to policy-makers in the region will be organized in March 2007.



*Above: Setting up of field experimental procedures in paddy fields for measuring emissions from biogenic sources*

## 2.13 CBA2006-07NSY-Lebel / AOA2006-01NSY-IHDP

**Project Title:** Institutional Dimensions of Global Environmental Change: Water, Trade and Environment

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**APN Funding:** US\$ 60,000

### Project Summary

The 5th APN/IHDP biennial International Human Dimensions Workshop (IHDW), with the theme "Water, Trade and Environment – the Institutional Dimensions of Global Environmental Change", took place on 13-26 October 2006, in Chiang Mai, Thailand. It is IHDP's flagship activity in the field of capacity building targeting young scientists mainly from developing countries. Its primary goal was to strengthen the analytical skills of participants in institutional and political analysis. The IHDW was done in partnership with APN, which given its physical location in Asia and strong involvement of Asian-Pacific participants, trainers and case studies, was huge benefit to the workshop. The two main components of the workshop were plenary sessions and working groups. The main focus of attention was "institutional analysis", complemented by discourse analysis, rights based approaches as well as scenario building and negotiation games. In addition a "participants' seminar series" took place, in order to develop individual or group-based research proposals. The "trainer's table" was another component as well as 4 field trips to water-related sites in and around Chiang Mai. Finally, several side-talks and meetings took place throughout the workshop. The final half-day long session was organised by the participants themselves which presented both the outcomes of the 2 weeks work and comprised participants' evaluation. A special segment was Science-Practice Dialogue.

*Above: IHDW participants at a field trip in one of the mountain watersheds in Chiang Mai*

## 2.14 CBA2006-08NSY-Salinger

**Project Title:** International Workshop on Coping with Agrometeorological Risks and Uncertainties: Challenges and Opportunities, New Delhi, India, 25-27 October 2006

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**APN Funding:** US\$ 20,000

### Project Summary

The workshop brought together 188 participants from 78 countries with leading experts who presented 27 state-of-the-art discussion papers to address coping with agrometeorological risk and uncertainties and then developing strategies to cope with these risks. In many parts of the world, climate change and extreme climatic events wind one of the biggest production risk and uncertainty factors impacting on agricultural systems performance and management. One of the most important coping strategies is improved use of climate knowledge and technology, which includes the development of monitoring and response mechanisms to current weather and future climate change. This CAPaBLE project provided scientists from 11 APN emerging and developing countries opportunity to interact with experts from different regions. Capacity building in the area of coping strategies for weather and climate risks contributes to sustainable agricultural development, especially in the Asia-Pacific region. The proceedings will be published as a special issue of *Agricultural and Forest Meteorology Journal* during 2007.



*Above:*  
Participants at the  
International  
Workshop on  
Agrometeorological  
Risk Management

## 2.15 CBA2006-09NSY-Raha

**Project Title:** Scoping Workshop on South Asia Rapid Assessment Project's (SARAP) Results for Designing Future Research Agenda and Capacity Building Requirements

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**APN Funding:** US\$ 20,000

### Project Summary

The APN-sponsored Scoping Workshop on South Asia's Rapid Assessment Project (SARAP) took place in Darjeeling, India on 9-11 October 2006. SARAP, under the Monsoon Asia Integrated Regional Study (MAIRS), synthesises global change-related research in South Asia, which include all the components of

physical and human dimensions of change in the Earth system (viz. climate, ecosystem, atmosphere, resources

and sustainable development). The salient features of each chapter of the SARAP book volume were presented and discussions for further refinement were made. In addition, key issues emerging out of the SARAP program were discussed in the workshop and areas for capacity building were identified. In conclusion, the workshop participants adopted the recommended priority research themes for South Asia, viz. Himalaya and the Indo-Gangetic Plain, coastal zones, and monsoon stability. The workshop was elaborately covered by the local newspaper and raised awareness among local stakeholders on key issues related to global change in South Asian perspectives.



*Above: APN-sponsored SARAP Scoping Workshop in the local news*

## 2.16 CBA2006-10NSY-Sari

**Project Title:** Institutional Dimensions of Global Environmental Change (IDGEC) Synthesis Conference: Institutions for Sustainable Development in the Face of Global Environmental Change: Questioning – Explaining – Demystifying (QED)

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**APN Funding:** US\$ 20,000

### Project Summary

Our understanding of the role of institutions both as drivers of environmental change and as a response to such change has matured substantially over the past ten years. From stand-alone entities to institutional complexes featuring interactions, institutions are now viewed as governance systems in a highly dynamic socio-ecological environment where change may be abrupt, nasty and irreversible. The IDGEC Synthesis Conference aimed to: 1) harvest the results of 10 years of research on the role of institutions in the human/environment interface; 2) explore the policy relevance of these findings; and 3) identify gaps and emerging questions for new research in this field. It was held successfully in Bali, Indonesia, on 6-9 December 2006, with 135 participants from 35 countries and roughly a third of which from the Asia-Pacific region. The conference exhibited a very high level of scholarship. The structure of the conference worked well to distill major research findings and explore their policy relevance. A highly diverse group of participants ensured lively debate and momentum for the next phase of research on institutions and environmental change.



*Above: IDGEC Synthesis Conference plenary session*

## 2.17 CBA2006-11NSY-Dai

**Project Title:** Strengthening Scientific Capacity in the Surface Ocean Lower Atmosphere Study (SOLAS): The 2007 SOLAS Open Science Meeting in Xiamen, China

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**APN Funding:** US\$ 20,000

### Project Summary

The Surface Ocean Lower Atmosphere Study (SOLAS) is a core project of the International Geosphere-Biosphere Programme (IGBP). SOLAS research strives to resolve the biogeochemical interactions between the air and sea, and the investigation of changes to air-sea interaction is one of the fundamental keys to understanding future global climate. The 2007 SOLAS Open Science Meeting in Xiamen, China aims to bring scientists from around the globe into a forum where networking, regional cooperation, and scientific collaboration will be fostered. As the meeting will take place with an APN nation, it is of particular importance to provide opportunities for APN-region scientists to participate. An announcement of solicitation of applications for conference participation was made to the SOLAS network, and about 30 legitimate applications were received by the SOLAS International Project Office. All applications were vetted by a subset of the SOLAS OSM Scientific Organizing Committee, and nineteen awards have been made. Awards have been provided to applicants from India (5), Thailand (1), Bangladesh (1), Indonesia (1), China (6), Republic of Korea (2), Japan (2), and the USA (1).

## 2.18 CRP2006-01NMY-Dixit

**Project Title:** Improving Policy Responses to Interactions between Global Environmental Change and Food Security across the Indo-Gangetic Plain (IGP)

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**APN Funding:** US\$ 60,000 (US\$ 180,000 over three years)

### Project Summary

Floods and droughts are recurrent phenomena on the Ganga Basin, which affects food security as well as other means of livelihood. There is growing concern among national policy-makers in the IGP that global environmental change (GEC) will seriously affect the production and equitable provision of food in the region, and undermine efforts aimed at socio-economic development. Principal concerns related to policy formulation in response to changes in the availability, quality and distribution of surface and ground waters, and changes in climate variability and mean values. The improved management of water resources is therefore a central aspect to all these policy goals, especially in the context of GEC. The project is expected to address the question on how will GEC affect water availability, and what will the consequences of these changes be for food systems in five case study districts across the IGP. Nepal Water Conservation Foundation is leading the study and has been providing overall project coordination and all the backstopping support for the project. A collaborative network of five research institutes in four member countries spanning the IGP Plain has been carrying out the project.

## 2.19 CRP2006-02NMY-Yan

**Project Title:** Integrated Model Development for Water and Food Security Assessments and Analysis of the Potential of Mitigation Options and Sustainable Development Opportunities in Temperate Northeast Asia

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**APN Funding:** US\$ 60,000  
(US\$ 180,000 over three years)

### Project Summary

Water scarcity and land degradation have put the local sustainable agriculture development in great danger in the north China, Mongolia and Russia Far East region, due to climate change and intensified human activities, seriously threatening regional water and food security. This project focuses on the development of an integrated water and food security assessment model which will contribute effectively to water and food security assessments, and therefore explore the potential of mitigation options and sustainable development opportunities in this region. The project held its first workshop in Beijing on 13-15 November 2006. This was attended by 20 experts from China, Mongolia, Russia, New Zealand and England, and discussions were made on the project planning and implementation, detailed research method, as well as future collaboration. Major model components have been reviewed and validated, such as the SimClim, DSSAT crop model, and two hydrological models – DHVSM and SWAT. The CAPsim model will be used as the main structure of the food security social economic model. Model coding and testing work are on-going.



*Above:*  
Participants at  
workshop on  
integrated  
model  
development

## 2.20 CRP2006-03NMY-Jintrawet

**Project Title:** Climate Change in Southeast Asia and An Assessment on the Impacts, Vulnerability and Adaptation on Rice Production and Water Resources

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**APN Funding:** US\$ 60,000 (US\$ 180,000 over three years)

### Project Summary

This 3-year project aims to enhance the research capacity of scientists in Southeast Asia in the study of climate change, impact, vulnerability and adaptation. It will investigate how long term climate change may have impacts on crop production and water resources in the region and also the vulnerability and adaptation of these systems. A regional climate model will be used to generate high resolution future climate conditions in the Southeast Asia region. The analysis on the impacts



of climate change on rice production will cover field experiments to observe rice productivity under different crop seasons as well as different crop treatments in order to monitor the impacts of climate on crop productivity, which will use rice cultivation as a case study, as well as soil fertility. The data gathered from field experiments will be used to adjust and calibrate the rice crop simulation model for the simulation of rice productivity under future climate conditions. In addition, this research project also covers the study of climate change impacts on water resources by analysing change in the hydrological regime in selected watersheds under different climate scenarios.

*Above:  
Seedbed  
preparation for  
the field  
experimental  
set-up on rice  
productivity*

## 2.21 CBA2006-12CMY-Boer

**Project Title:** Increasing Adaptive Capacity of Farmers to Extreme Climate Events and Climate Variability through Enhancement of Policy-Science-Community Networking

**Project Leader:** Dr. Rizaldi Boer  
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**APN Funding:** US\$ 30,000  
(US\$ 45,000 in 2005; Year 3 expected funding: US\$ 20,000)

### Project Summary

The purpose of this project is to increase understanding and develop the capacity of local scientists on climate information application and enhance their working relationship with policy-makers in assisting farmers to address climate-related problems. It has successfully established research nodes in five regions in Indonesia and delivered training for scientists on the research

methodology for climate risk management in the agriculture sector and on the use of climate prediction tools developed by the International Research Institute for Climate and Society (IRI). Scientists from the regions have been exposed to scientific discussion with international leading experts from the University of Stanford, Asia-Pacific

Economic Cooperation (APEC) and IRI working in the area of climate forecasting and its applications. They have used the tools and methodologies delivered in the training for identifying climate related problems and potential application of climate forecasting information in managing these problems through a Participatory Rural Appraisal (PRA) survey. Local workshops have also been completed to enhance the connection between the APN CAPaBLE activities and local government programs.



*Above:*  
Scientific  
discussion with  
experts from  
the University  
of Stanford

## UPDATED PROJECT LEADER CONTACT INFORMATION

Should the contact information of any of the Project Leaders listed in this publication have changed, please kindly fill out the form below and return it by fax or email to:

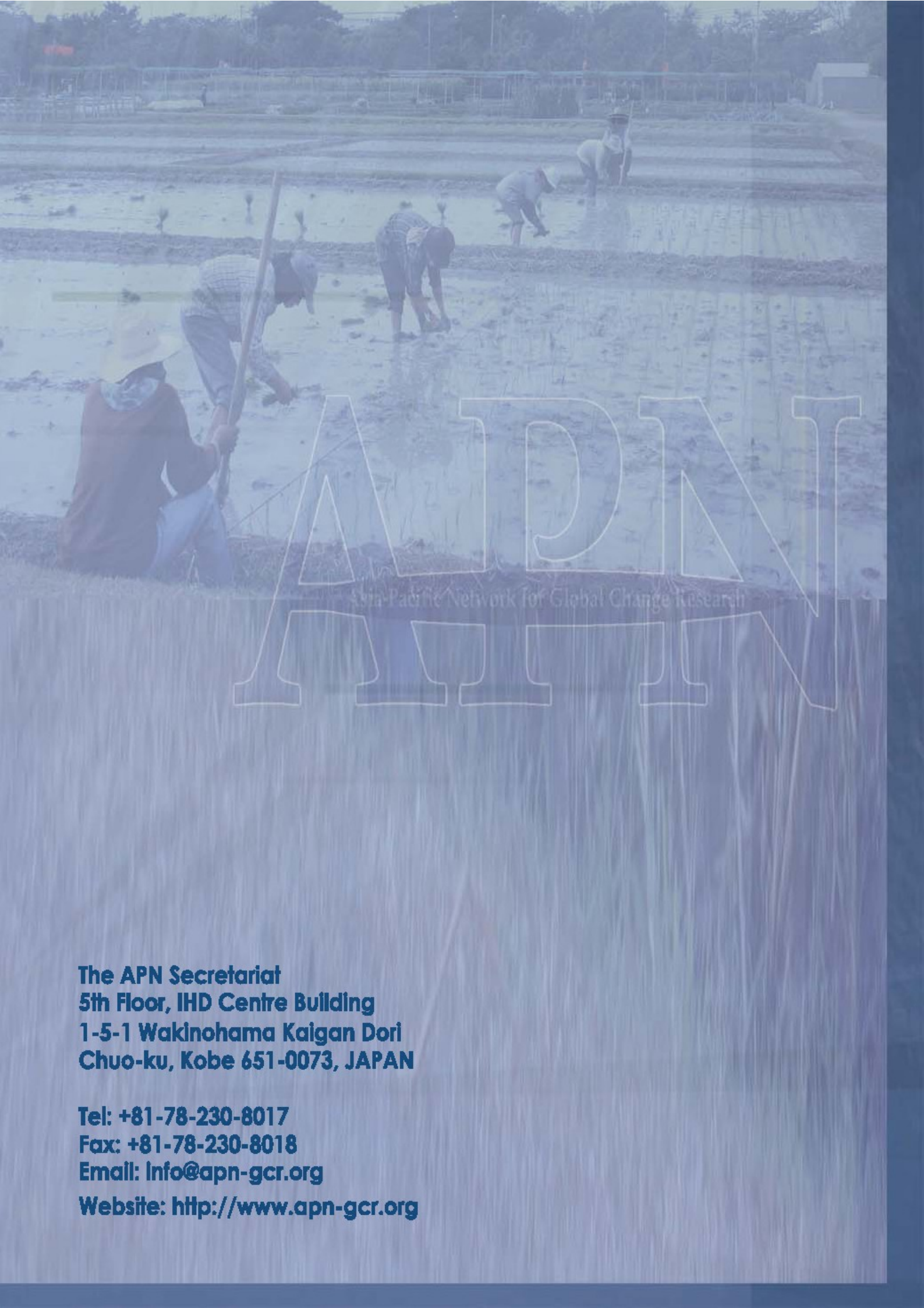
The APN Secretariat  
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<b>Contact Details</b>	
<i>Full Name</i> (write LAST NAME in CAPS)	<i>Title</i> (select as appropriate) <input type="checkbox"/> Dr. <input type="checkbox"/> Prof. <input type="checkbox"/> Mr. <input type="checkbox"/> Mrs. <input type="checkbox"/> Ms. <input type="checkbox"/> Other _____
<i>Qualifications/Specialty</i>	
<i>Specific areas of interest relating to Global Environmental Change</i>	
<i>Name of Organisation</i>	<i>Designation/Position</i>
<i>Type of Organisation:</i> <input type="checkbox"/> Government Agencies <input type="checkbox"/> Educational Institutions <input type="checkbox"/> NGOs/NPOs <input type="checkbox"/> Private Foundations <input type="checkbox"/> Professional Societies <input type="checkbox"/> Others	
<i>Business Address</i>	<i>Postal Code</i>
	<i>Country</i> (in CAPS)
<i>Telephone</i>	<i>Facsimile</i>
<i>Email</i>	<i>Website</i>

This form may also be downloaded from this link:  
[http://www.apn-gcr.org/en/downloads/blankform\\_apndirectory.pdf](http://www.apn-gcr.org/en/downloads/blankform_apndirectory.pdf)

*Photo on back and front covers:*

Preparation of seedbed for field experimentation on rice productivity  
from APN CAPaBLE CRP project CRP2006-03NMY-Jinrawet.



# APN

Asia-Pacific Network for Global Change Research

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