

Annual Report

2007/2008



Annual Report 2007/2008
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MESSAGE FROM THE NEW DIRECTOR



It is my honour to deliver to you the 2007/2008 Annual Report, which provides you with non-technical summaries of APN-funded projects in Asia Pacific Region carried out and completed in 2007/2008.

Based on our achievement of more than 10 years, the APN certainly left footprints on several occasions of current international importance in 2007/2008 such as the ECO-Asia (September 2007, Fukuoka, Japan) and UNFCCC COP13/MOP3 (December 2007, Bali, Indonesia) and many other events listed on pages 55-56. At these fora, we have organised and/or participated in side events and successfully highlighted our global change research and capacity building activities in the context of the meetings.

Four years after its introduction, the CAPaBLE (Scientific Capacity Building and Enhancement for Sustainable Development in Developing Countries) Programme has now stepped into its second phase. Indeed, CAPaBLE has grown as another major pillar of the APN after the ARCP (Annual Regional Call for Research Proposals), and is certainly meeting the capacity building needs increasingly recognised in the global change community. In this background and timing, we published the CAPaBLE Phase I Brochure and distributed it at several global change events. In 2007/2008, we funded 20 ARCP projects and 12 CAPaBLE projects (including 3 comprehensive research projects).

Let me take this opportunity to express my great appreciation and thanks to the governments, organisations and members of the APN, who provided scientific input, shared their expertise, contributed financially and further strengthened its institutional foundation, all of which made the APN's activities very successful. The APN would have not accomplished the activities specially highlighted in this Annual Report 2007/2008 without your support, cooperation and dedication.

We are also indebted to all of our global change research programmes and capacity development partners who share the same interests and whose partnerships are very valuable in the pursuit of our goals and objectives. I look forward to continually working with you all and I am very happy to present this publication to you also as a sign of our gratitude.

A handwritten signature in black ink, which appears to read 'T. Fujitsuka'. The signature is stylized and written in a cursive-like font.

Tetsuro Fujitsuka
Director, APN Secretariat

MESSAGE FROM THE FORMER DIRECTOR



The year 2007 was a year when global change, climate change in particular, clearly appeared at international fora. Scientifically, the IPCC AR4, the most important publication in the global change community of the year, specifically cited around 40 publications from APN supported activities (subject to further analysis). The APN also appeared in several occasions of current international importance: 26th Session of Subsidiary Body for Scientific and Technological Advice (SBSTA) of the UNFCCC (May, Bonn, Germany) and the UNFCCC COP13/COP-MOP3 (December, Bali, Indonesia). At these fora, we participated in side events and successfully highlighted our global change research and capacity building activities in the context of the meetings.

Quality proposals on global change research and capacity development constitute the basis of the APN's activities. In June, we launched Calls for Proposals to be funded in 2008/09 utilising a revamped Proposals Submission and Review Process. First, proponents submit summary proposals which undergo a screening process performed by the SPG Sub-Committee, and only those proponents that pass this stage are asked to submit full proposals for further consideration. This screening was introduced for the first time in 2007 to avoid wasting proponents' and reviewers' valuable time.

In addition to the publication of the APN Annual Report 2006/2007 and the Volume 2 of the Project Bulletin, our activities were compactly outlined in the Early Achievement publication at the GEOSS Ministerial Meeting (November, Cape Town) and in our own CAPaBLE Phase 1 Brochure.

Our own meetings were also effective: the first Southeast Asia Sub-Regional Committee Meeting (20-21 August 2007, Jakarta) founded a basis for sub-regional activities, the 7th Steering Committee Meeting/6th Capacity Development Committee Meeting (4-5 Oct, Kobe) and the 13th IGM/SPG Meeting (18-20 Mar, Kobe) established a basic plan for the review of the 2nd Strategic Phase and the development of a new Strategic Plan for the third phase.

I would like to express my sincere appreciation to the governments, organisations and members of the APN, who contributed to the success of APN's activities scientifically, financially and institutionally. Among them, my special thanks go to the Steering Committee (SC) led by the Chair Mr. Samuel Peñafiel and the SPG Co-Chairs, Dr. Andrew Matthews and Mr. G.H.P. Dharmaratna, all of them newly elected for 2007~2009 term at the 12th Honolulu IGM/SPG Meeting in March 2007. Without your support, the work of the APN in 2007/2008 would not have been possible. Furthermore, allow me to thank all global change research programmes and capacity development partners for their interest and collaborative efforts.

A handwritten signature in black ink, which appears to read "Hiroki Hashizume". The signature is fluid and cursive, written in a professional style.

Hiroki Hashizume
Former Director, APN Secretariat

MISSION AND GOALS

APN's Mission

The mission of the Asia-Pacific Network for Global Change Research (APN)¹ 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.

APN's Goals

In order to achieve its mission, the APN has identified five goals. Each goal will be achieved as outlined below, particularly through APN-funded activities; these activities are selected from the Annual Regional Call for Proposals (ARCP) process, as well as the APN's capacity development programme, CAPaBLE.

- Goal 1. Supporting regional cooperation in global change research on issues particularly relevant to the region
- Goal 2. Strengthening appropriate interactions among scientists and policy-makers, and providing scientific input to policy decision-making and scientific knowledge to the public
- Goal 3. Improving the scientific and technical capabilities of nations in the region
- Goal 4. Cooperating with other global change networks and organisations
- Goal 5. Facilitating the development of research infrastructure and the transfer of know-how and technology



¹ The APN defines "global change research" as "research regarding global change (the set of natural and human-induced changes in the earth's physical and biological systems that, when aggregated, are significant at a global scale and its implications for sustainable development in the Asia-Pacific region."

CORE STRATEGIES AND VISION

Core Strategies

The core strategies of the APN are to:

1. Encourage and promote research that has the potential, in addition to improving 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.
2. Identify, in consultation with policy-makers and practitioners, present and future needs for such research.

Vision

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.

The APN seeks to identify such emerging 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 development of a sound scientific basis for policy- and decision-making related to issues for which global change is an important factor.

The APN strives to enable developing countries of the region to participate increasingly in, and to benefit fully from, cooperative research in the region. Finally, recognising the interactive role of regional processes in the overall Earth system, the APN also seeks to link the research it sponsors with research conducted in other regions and under the aegis of global-scale programmes.



HIGHLIGHTS OF 2007/2008

This section contains the major activities undertaken by the APN in 2007/2008.

Scientific Activities

Supporting/managing projects under the Annual Regional Call for Research Proposals (ARCP) and Scientific Capacity Building/Enhancement for Sustainable Development in Developing Countries (CAPaBLE) Programme is a high priority activity of the APN. Since the 12th Inter-Governmental Meeting (IGM)/Scientific Planning Group (SPG) Meeting in March 2007, the APN supported/managed 20 projects (12 new and 8 continuing) from the funded activities budget under the ARCP process. From the funded activities budget under CAPaBLE, APN supported 7 new and 2 continuing capacity building (CBs) projects and 3 continuing comprehensive research projects (CRPs).



Scientific Planning Group discussing which proposals will be recommended for funding to the IGM

Please refer to the “APN Funded Projects” Section of this Annual Report for a brief summary and publication list of projects completed in 2007/2008.

New Call for Proposals Process

The APN effectively implemented a more streamlined process for the calls for proposals, following recommendations at the 12th IGM/SPG Meeting. This new procedure includes a voluntary Advisory Service and a compulsory Proposals Submission and Review Process. The Advisory Service aims to assist project proponents in strengthening their proposals. By sending a Letter of Intent to the APN Secretariat, potential proponents may seek advice in the appropriateness of the proposal to be submitted for APN funding consideration. This service also provides assistance to emerging young scientists seeking collaborators in the region.

The Proposals Submission and Review Process has been further streamlined to ensure a less time-consuming process for proponents and reviewers alike. The proponents are asked to submit a summary proposal first, subject to review of the SPG Sub-Committee Members. Only those proponents who pass this stage are asked to submit a full proposal for further consideration.

Strengthening Sub-Regional Cooperation

The APN, being a unique network of governments with participants from both the science and policy communities, welcomes new mechanisms that strengthen the links between scientists and policy-makers and was pleased at the initiative of its member countries in Southeast Asia to form a sub-regional committee that would address this need.

On 21-22 August 2007, the 1st Southeast Asia Sub-Regional Committee (SEA-SRCom) Meeting was held in Jakarta, Indonesia. The aim of this meeting was to try a new model to improve communications among the APN members, specifically in SEA, and in so doing, use instead and enhance the function of the previous APN liaison officers. APN Members from SEA discussed mechanisms for the operation of a sub-regional committee, including its organisational structure, membership and functions.



Chair of the Southeast Asia Sub-Regional Committee, Ms. Liana Bratasida, presented relevant issues to the members

Each country representative also gave a presentation focusing on the needs, priorities, problems and possible solutions in relation to global change research. On science-policy linkages, challenges in the successful integration of science and policy were explored, and the need for demand-driven research or scientific assessments was highlighted. The SEA-SRCom summarised and proposed mechanisms for improving science-policy linkages, which include ensuring that all relevant stakeholders are involved from project scoping up to the communication of results of scientific assessments; incorporating institutional as well as local and indigenous knowledge whenever appropriate in the assessment process; and presenting scientific findings in different points of view and in a manner that is easily understandable among decision-makers.

The APN hopes that following the example of the SEA-SRCom, similar activities in other sub-regions will ensue to address the need for more effective communication among the APN membership and stronger links between science and policy.



Participants during the presentation of country reports

APN International Seminar

The **APN International Seminar “Global Warming Ecosystem/Biodiversity Changes: Facing the Challenge of Changing Ecosystems”** convened in Kobe, Japan, 02 December 2007. It was co-organised by the Hyogo Prefectural Government and DIVERSITAS in Western Pacific and Asia (DIWPA). The seminar was also held as one of the pre-events to the G8 Environment Ministers Meeting which was held in the same city, in May 2008.



The seminar was held in English/Japanese (with simultaneous interpretation)

Six experts who study influences of global warming were invited as speakers to share with the public the latest scientific results related to the theme and to stress the importance of adaptation. The Seminar, which was attended by more than 140 participants, was divided into three main sessions: Part 1 - The Current Situation and Projection of Ecosystems in Japan; Part 2 - The Current Situation and Projection of Ecosystems in Asia and the Pacific; and Part 3 - Discussion/Open-forum.

The Current Situation and Projection of Ecosystems in Japan

Dr. Toshi Nagata, Kyoto University, Japan, pointed out how global warming affects the Lake Biwa ecosystem causing great social concern. Lake Biwa is the largest freshwater lake in Japan and home to 58 indigenous species and more than 1,000 animals and plants which are essential not only to Japan but to the world. Recent studies predicted the possibility of deficient ‘total circulation’ due to global warming.



‘Total circulation’ is a physical phenomenon where winter cooling of highly dense surface water sinks causing the lower layer of water and the upper layer of water to mix (convection). The insufficient cooling caused by global warming results in low or no oxygen at all reaching the lakebed and deeper layers of the lake; thus, potentially endangering the biological habitat. Elution of nutrient salts and hazardous chemical substances from the lakebed sediments could also trigger a sharp decline in water quality or outbreak of algae. Dr. Nagata stressed the importance of forecasting the future ecology of Lake Biwa based on scientific data.



An overview of the impacts of global warming on natural forests in Japan was presented by Dr. Nobuyuki Tanaka, Forestry and Forest Products Research Institute (FFPRI), Japan. His presentation focused on predicting suitable habitats under current and future climate conditions for Buna (*Fagus crenata*) forests, a typical Japanese natural forest. A study revealed that migration of Buna cannot keep up with the shift of suitable

habitats (10-50km/100yr) due to climate warming because the past migration speed of *Buna* after the last glacial period was estimated to be 23km/100yr in some areas like Honshu and Hokkaido.

He asserted the importance of assessing the adverse impacts of climate change on many plant species and proposing adaptation measures for conserving biodiversity such as determining vulnerable areas and refugia, planting, reducing species competition, making corridors of natural vegetation, and taking other protective management measures.

Another expert from FFPRI, Dr. Hiromu Daimaru, gave a presentation on snow cover decrease and its impact on a mountain wet meadow. His report showed that present snow accumulation and snowmelt processes indicate that fluctuations of winter climate significantly influence the dimensions of summer snowpatches. Snowpatch grasslands in Japan are valuable not only as habitats for rare plant species, but also as records of past climates. Some climate models predict that increases in greenhouse gases will bring about decreased snowfall in winter and increased warming in the melt season in Japanese mountains. Global warming, therefore, will lead to extreme shrinkage or extinction of snowpatch grasslands.



The Current Situation and Projection of Ecosystems in Asia and the Pacific



Dr. Mastura Mahmud, University Kabangsaan, Malaysia, talked about tropical deforestation and its impact on the environment and quality of life. She emphasised that the multivariate causes in tropical deforestation make it extremely difficult to develop a widely accepted and applicable policy that can manage the issues of deforestation. She further noted that it is imperative that commitment and willpower of the people and decision-makers be reinforced for the survival of humans in the light of global warming.

A presentation on the influence of global warming and land-use on the tropical rain forests of Southeast Asia was given by Dr. Kanehiro Kitayama, Kyoto University, Japan. He used Borneo, the third largest island in the world, which used to support the biggest area of contiguous tropical rain forest in Southeast Asia, as a model system of the Southeast Asian tropics to demonstrate present land-use changes and how these changes may interact with climate change to influence rainforests. Studies showed that if unsustainable logging continues, coupled with severe droughts due to global warming, the tropical rain forests of Borneo might irreversibly become the major source of carbon, which may lead to the loss of important habitats.



Dr. Chuluun Togtohyn, Colorado University, U.S.A., reported on the vulnerability of the Mongolian steppe and nomadic culture to climate change. He explained how 'ecosystem function and services' in Mongolia change abruptly due to interacting climate change and human activities. This situation demands the implementation of adaptation strategies at pastoral community, local administrative

unit, river basin, sub-regional and country levels, with participation of all stakeholders. He also mentioned that these strategies to global environmental change should be linked to sustainable development and the Millenium Development Goals.

In his presentation, Mr. Basanta Shrestha, International Centre for Integrated Mountain Development (ICIMOD), Nepal, underscored the impacts of climate change on Himalayan glaciers and glacial lakes. ICIMOD developed a comprehensive database to understand the impacts of global change in the Himalayas and several studies revealed that most glaciers in Himalaya have been shrinking at accelerated rates in recent decades due to climate change. Noting that the Himalayan Region is the womb of ice glaciers and the water tower of Asia, adaptive mechanisms and vulnerability assessments are necessary to forewarn the community.



Facing the Challenge

The last part of the seminar, moderated by Dr. Tanaka, was an open discussion wherein participants were given the opportunity to comment on the presentations and ask questions. It was raised that two elements of biodiversity and ecosystems will definitely undergo changes and that global warming will proceed to an extent that poses negative effects on these elements. Therefore, action must be taken in order to adapt to climate change and global warming. Further, experts and scientists play an important role and should communicate their research results to policy-makers. This concern points to another challenge in how science can be better translated into policy, action and practices – a challenge that APN also faces.

The panellists agreed that climate change is one of the serious problems being faced by humankind and that the time has come for people to think collectively; determine what the human-induced impacts and natural impacts are, and then act accordingly.



The APN would like to thank the Hyogo Prefectural Government, DIWPA and the following institutions for their support in the success of the Seminar: Ministry of the Environment, Japan (MOEJ); Institute for Global Environmental Strategies (IGES), Kansai Research Centre; Hyogo Environmental Advancement Association, and the Japanese Society of Environmental Education, Kansai Branch.

Bilingual (Japanese and English) Proceedings of the International Seminar



ARCP Annual Regional Call for Research Proposals

CAPaBLE Scientific Capacity Building and Enhancement for Sustainable Development in Developing Countries



APN FUNDED PROJECTS



**New Publications
from APN Completed Projects**

Young Scientists' Section

**Special Report: APN's
Contribution to the IPCC AR4**



ARCP

Highlights and publications for completed APN projects are included in this chapter of the Annual Report. Further details on any of the projects highlighted in this publication can be obtained by contacting the APN Secretariat at info@apn-gcr.org or visiting the APN website at <http://www.apn-gcr.org>.

ARCP2007-02CMY-Koike: International Integrated Water Data Access and Transfer in Asia (IIWaDATA) Project

Project Leader: Prof. Toshio Koike

Email: tkoike@hydra.t.u-tokyo.ac.jp

Funding: US\$ 86,000 (2 years)

Participating Countries: Bangladesh, China, India, Indonesia, Japan, Mongolia, Pakistan, Philippines, Thailand, Viet Nam

About 60% of the world's population lives in Asia, and their various social activities including agriculture depend on the Monsoon rain. Simultaneously, the water cycle variation in Asia can be the cause of droughts and floods and, consequently, may be responsible for enormous human and economic damage.



Water-related issues in Asia

In recognising the need for accurate, timely, long-term, water cycle information as a basis for sound and effective water resources and risk management as well as current initiatives pursuing to meet this need, the IIWaDATA project initiated and contributed to the development of a sustainable scheme for water cycle data collecting, sharing, exchanging, and management at the regional level in Asia in cooperation with national governments, institutes and research communities and also international organisations that are consistent with the Global Earth Observation System of Systems (GEOSS), especially its Water theme component.

Through a series of meetings, the IIWaDATA project established mutual consensus among the participating countries and international organisations that defines data sharing and exchanging policy and responsibilities for data processing, management and archiving. This strong cooperative framework has evolved into a large regional initiative recognised by the Group on Earth Observations (GEO) as a GEOSS activity: GEOSS Asian Water Cycle Initiative (AWCI). The IIWaDATA project significantly contributed further to the Data Integration and Analysis System (DIAS) that was launched in 2006 as part of the Earth Observation and Ocean Exploration System, which is one of five National Key Technologies defined by the 3rd Basic Program for Science and Technology of Japan.

The project brought together scientists, water resources managers and policy- and decision-makers from 18 Asian countries, and established a mutual consensus (Data Policy) among these countries as well as a number of national and international

organisations, that defines data sharing and exchanging policy and responsibilities for data processing, management and archiving.

As a result of initial discussion that took place during the 1st and 2nd Asian Water Cycle Symposia (held in Tokyo, Japan, November 2005 and January 2007, respectively) and the 1st IIWaDATA International Task Team Meeting (held in Bangkok, Thailand, September 2006), a strong collaborative framework was established that evolved into a larger regional initiative which has a longer-term outlook envisioning continued activities to help mitigate water-related disasters and promote the efficient use of water resources.

The GEOSS/AWCI Implementation Plan, currently in its draft format, was developed based on the above agreed Data Policy. The Plan describes the goals and objectives of AWCI and strategies towards achieving these goals that include the Demonstration Project approach coordinated with the Capacity Building program. The project has also helped in further developing the DIAS system and begun to provide valuable hydro-meteorological and other water-cycle related data to its database. Through the DIAS system, the data is available (free of charge) to anyone through the Internet.

In parallel with the efforts dedicated to the establishment of GEOSS/AWCI, the project was involved in and contributed to DIAS. In addition, development of other important tools including downscaling techniques and advanced hydrological models was also supported by the project.

Publication: The GEOSS/AWCI Implementation Plan (draft version, July 2008); available for download on the AWCI website.

**ARCP2007-03CMY-Nadaoka:
Integrating Support System for
Managing Environmental Change and
Human Impact on Tropical
Ecosystems in East Asia and the
Pacific**

Project Leader: Prof. Kazuo Nadaoka

Email: Nadaoka@mei.titech.ac.jp

Funding: US\$ 56,500 (2 years)

Participating Countries: Fiji, Indonesia,
Japan, Philippines, Samoa, Thailand



Local media at workshop discussion

Timely and accurate detection, understanding and prediction of coastal environmental changes are crucial for management and decision-making to address possible resource conflicts and value trade-offs. However, information and analysis tools are still far from ideal. In managing coastal resources, the complex interactions between social, economic and environmental systems comprising the coastal zone must be considered. Global/regional phenomena (e.g. global climate change) should also be considered to achieve sustainability in the management and utilisation of coastal resources in the short-



Discussion at field sites in Puerto Galera, Philippines

and long-term. Effective management also requires collaboration between researchers, policy-makers and the community. There is a need to link science and decision-making stressing the continuum of exp from basic science to applied science to policy, governance and management.

The project aimed to strengthen current and future coastal observational (in-situ and space-based) and modelling capabilities and decision-making processes by developing a region-wide, collaborative strategy for data

exchange and analysis among coastal scientists and managers. The project collected useful data, providing information in understanding reef hydrodynamics and water quality, watershed discharge dynamics, long-term connectivity between reef and watershed considering the influence of socio-economic environment. This data served as baseline data for the sites studied. The project demonstrated how various data can be processed and integrated using geo-spatial technologies and modelling techniques. For example, various scenarios on how water quality in the Puerto Galera Bay can be improved were investigated using hydrodynamic and water quality modelling. The socio-physical survey in Puerto Galera indicated the people's varying perception of environmental quality.

Through the collation of historical data and additional field observations, the project integrated information from the physical, natural and social disciplines into a cohesive analytical framework (i.e. spatial analysis and numerical modelling). This framework served to establish major environmental changes, linkages, patterns, and short- and long-term trends within and among the human and natural systems of tropical coastal environment in East Asia and the Pacific. Specifically, the Project focused on sediment and nutrient regime in inland and shallow marine coastal systems. The framework included a global and regional component in order to understand the influence of global climate change on local conditions affecting sedimentation and nutrient delivery.

The project concluded that management and socio-economic aspects of an integrated coastal zone management must be supplemented with scientific data on the biophysical environment. Furthermore, monitoring of key environmental variables is critical in the protection of the coastal ecosystem. Loadings of sediments, nutrients and other materials into rivers and streams and subsequently to the reefs and bays need to be quantified. Through the case studies undertaken, the effect of sediment and nutrient discharges from the watershed and point sources in the water body itself (e.g. fish cages) is largely affected by hydrodynamics. Modelling of hydrodynamics and water quality is an effective tool for assisting managers in making informed decisions to protect and conserve coastal environmental resources. It is also essential to incorporate into the decision-making process the potential influence of global climate change such that decisions are made not only to address the need of the present generation but also of future generations to come.

Selected Publications:

- Ashikawa, K. and Nadaoka, K. 2008. Field Observation and Analyses of Water Quality Characteristics in a Dense Aquaculture Area Adjacent to a Coral Reef in Bolinao, Philippines. *Proceedings of Coastal Engineering, JSCE, Vol.54 (In Japanese)*.
- Blanco, A., Nadaoka, K. and Yamamoto, T. 2008. Planktonic and Benthic Microalgal Community Composition as Indicators of Terrestrial Influence on a Fringing Reef in Ishigaki Island, Southwest Japan. *Marine Environmental Research* (66): 520-535.
- Nadaoka, K., Yamamoto, T. and Arisaka, K. 2007. Analysis of Hydrodynamics Characteristics of S Fringing Reef and their Formation Mechanism under Typhoon Condition. *Proceedings of Coastal Engineering, JSCE, Vol.54, No.2, pp. 1066-1070 (In Japanese)*.

ARCP2007-05CMY-Lasco: Linking Climate Change Adaptation to Sustainable Development in Southeast Asia

Project Leader: Dr. Rodel D. Lasco
Email: r.lasco@cgiar.org
Funding: US\$ 35,000 (2 years)
Participating Countries: Indonesia, Lao PDR, Philippines, Viet Nam



Climate change is one of the primary concerns of humanity today. The IPCC AR4 states that climate is indeed changing and that human activities largely contribute to this change. Indeed, climate change will exacerbate current stresses on natural and social systems (Adger et al., 2003). As the climate changes, increasing attention is given to how societies and natural systems can adapt to a new climate regime.



Working group discussing climate change adaptation (top) and presentation of the synthesis report (above)

Recently, it is being recognised that the way to address climate change is to integrate adaptation policies into sustainable development programmes of the country (Huq *et al.*, 2003). By mainstreaming climate change adaptation into sustainable development and poverty reduction strategies, the most vulnerable sectors (poor people) will become more resilient to climate change (Sperling, 2003). However, the link between climate change adaptation and sustainable development is not explicitly recognised 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 project aimed to help clarify the links between climate change adaptation and sustainable development. By engaging the policy-maker community and other relevant stakeholders, the project hoped to contribute to the mainstreaming of climate change adaptation to the sustainable development agenda of Southeast (SE) Asian countries.



Participants at the Science-Policy Workshop

There is limited information on how developing countries in the region adapt to climate change. The project's activities helped identify the most appropriate climate change adaptation strategies for the natural resources and agriculture sectors as

well as rural communities. More importantly, the link of these adaptation strategies to the sustainable development agenda of each country was analysed. The project synthesised recent climate change adaptation and related research in the region (e.g. the recently completed Assessments of Impacts and Adaptations to Climate Change [AIACC] research involving the project leader and other collaborators). The results were used to build the capacity of national decision-makers through a science-policy workshop, which sought to promote dialogue between the science and policy communities in the SE Asian region.

Results showed that in the three countries (Indonesia, Philippines and Viet Nam), it is recognised that integration of climate change adaptation into sustainable development programmes is highly important. The adverse impacts of climate change are among the contributory factors why sustainable development efforts of the three countries are not being achieved. However, this can be addressed if climate change adaptation strategies are mainstreamed in the respective sustainable development plans of each country. Currently, sustainable development plans/programmes in Viet Nam, Indonesia and the Philippines do not yet integrate climate change. However, there are on-going discussions on how climate change adaptation can be mainstreamed. While there is no clear evidence that the project contributed to the mainstreaming of climate change adaptation to the sustainable development agendas of Indonesia, Philippines and Viet Nam, engagement of the stakeholders during the conduct of the research and the science-policy workshop triggered stakeholders to support the integration of climate change adaptation in sustainable development.

Publications:

- Lasco, R.D., Delfino, R.J.P., Pulhin, F. B. and Rangasa, M. 2008. The Role of Local Government Units in Mainstreaming Climate Change Adaptation in the Philippines. *AdaptNet Policy Forum 08-09-P-Ad*, 30 September 2008. Available at: <http://gc.nautilus.org/gci/adaptnet/policy/2008/climate-change-philippines>
- Lasco, R.D., Perdinan, Phon-asa, C., Hien Thuan, N.T., Pulhin, F.B. and Delfino, R.J.P. 2008. Linking Climate Change Adaptation to Sustainable Development in Southeast Asia. Project Synthesis Meeting Report. 101 pp.
- Lasco, R.D., Perdinan, Phon-asa, C., Hien Thuan, N.T., Pulhin, F.B. and Delfino, R.J.P. 2008. Linking Climate Change Adaptation to Sustainable Development in Southeast Asia. Science-Policy Workshop Report. 151 pp.
- Lasco, R.D. and Delfino, R.J.P. 2006. Linking Climate Change Adaptation to Sustainable Development in Southeast Asia [Project Poster].

ARCP2007-09NSY-Skole: Carbon Financial Markets, Rural Poverty and Global Change in Southeast Asia – Scoping Workshop, Training and Project Development

Project Leaders: Dr. David Skole and Mr. Jay Samek

Email: skole@msu.edu; samek@msu.edu

Funding: US\$ 30,000 (1 year)

Participating Countries: Cambodia, Lao PDR, Viet Nam, USA



Carbon Training in Thailand

Two of the greatest threats to planetary peace and prosperity are global climate change and extreme poverty. This project was based on the premise that both of these problems can be simultaneously addressed through a single intervention: The promotion of more carbon intensive, or “greener,” forestry and agriculture in impoverished rural communities in developing countries. Aside from the combustion of fossil fuels, agriculture and the conversion of forest to agricultural land are also the leading sources of greenhouse gas (GHG) production.

For many smallholder farmers in developing countries, the only recourse to a reduction in productivity is to expand the surface area under production, leading to an increase in the clearing of forestlands and the release of more carbon into the atmosphere. Introducing locally appropriate land-use changes, and linking these to the rapidly growing external carbon financial markets will create the necessary conditions for poverty reduction and GHG mitigation, while making environmental conservation a profitable undertaking and thereby introducing a new type of sustainability.

In order to achieve the long-term objectives of linking carbon offsets from agroforestry and afforestation/reforestation activities at the community level with carbon financial markets, training and planning must take precedent. This project supported: 1) training and project-scoping workshop; and 2) field site visits for validation and in situ biomass measurements. Capacity building materials specific to: 1) carbon cycle science; 2) carbon financial markets; and 3) measuring, monitoring and managing forest-related carbon sequestration projects were developed for the regional workshop. Information materials specific to potential carbon projects in Cambodia, Lao PDR, Thailand, and Viet Nam were also developed for the workshop.

From the field site visits, introductions regarding carbon sequestration and carbon markets were made to local landowners, community groups and local, regional and national government officials and agencies. Initial data collection resulted in Global Positioning System (GPS) field points and polygons, digital pictures, and in some sites the establishment of permanent sample plots for collecting routine biometric data. Through collaboration and dialogue, the project participants were able to identify a number of pilot project sites with the four Southeast Asian countries that represented a suite of smallholder farming and land management systems. The variation in landscapes and management systems is posing challenges to developing measurement and monitoring

methods for carbon sequestration and opportunities to develop new protocols for approval in nascent carbon markets, such as the Chicago Climate Exchange.

Publications: Two pending at time of writing.

ARCP2007-15NSY-Parish: Assessing Mitigation and Adaptation Options for Tropical Peatlands to Reduce GHG Emissions and Increase Resilience to Climate Change

Project Leader: Mr. Faizal Parish

Email: fparish@genet.po.my

Funding: US\$ 40,000 (1 year)

Participating Countries: Australia, Bangladesh, Japan, Sri Lanka, Thailand and Viet Nam



Degradation of tropical peatlands is a major and growing source of anthropogenic GHG emissions. By some estimates, current carbon dioxide emissions from peatland drainage, fires and exploitation are equivalent to at least 3,000 million tonnes per annum or equivalent to more than 10% of global fossil fuel emissions. This project has strengthened understanding and partnership among stakeholders in relation to peatlands and climate change in particular contributions to policy-makers through dialogues and workshops, input to conventions deliberations and web-based information dissemination.

The project provided the essential information and understanding needed on tropical peatlands ecosystems in South East Asia especially related to GHG emissions and how its losses are further enhancing global climate change. Significant input has been made to the decisions of the Convention on Biological Diversity (CBD) and United Nations Framework Convention on Climate Change (UNFCCC). Further to that, a web-based framework for information on peat and its relations to climate change is now providing both general and scientific information related to peatlands, biodiversity and climate change to influence the development of sound policies and decisions by stakeholders. The project made significant progress in collating, for the first time, information on the importance of peatlands for biodiversity and climate change through the preparation of a global assessment on this subject, which was formally welcomed by the CBD and officially promoted to the UNFCCC parties.

<http://www.peat-portal.net/>

The project concluded that:

- ✚ *Peatland issues should be better incorporated into international frameworks (e.g. CBD, Ramsar, UNFCCC, Convention to Combat Desertification [CCD] and so on) as well as regional policy processes. Conservation and rehabilitation of peatlands provide a major opportunity to reduce current global greenhouse gas emissions.*
- ✚ *Policy and management frameworks often fail to recognise the special eco-hydrological characteristics of peatlands that are so important for their sustainable management.*
- ✚ *Strict protection of intact peatlands is critical for the conservation of biodiversity and will maintain their carbon storage and sequestration capacity and other associated ecosystem functions.*
- ✚ *Relatively simple changes in peatland management (such as better water management and fire control in drained peatlands) can improve the sustainability of land use and limit negative impacts on biodiversity and climate.*
- ✚ *Optimising water management in peatlands (i.e. reducing drainage) is the single highest priority to combat carbon dioxide emissions from peat oxidation and fires as well as address peatland degradation and biodiversity conservation.*
- ✚ *Enhancing awareness and capacity, addressing poverty and inequity, and removing perverse incentives are important to tackle the root causes of peatland degradation.*
- ✚ *The emerging carbon market provides new opportunities for peat swamp forest conservation and restoration and can generate income for local communities.*

Publications: In addition to the publications below, this project has a number of papers pending publication.

- Parish, F., Sirin, A., Charman, D., Joosten, H., Minayeva, T., Silviu, M. and Strringler, L. (Eds). 2008. Assessment on Peatlands, Biodiversity and Climate Change: Main Report. Available at: <http://www.peat-portal.net/index.cfm?&menuid=123&parentid=113>.
- Parish, F., Sirin, A., Charman, D., Joosten, H., Minayeva, T. and Silviu, M. (Eds.) 2007. Assessment on Peatlands, Biodiversity and Climate Change: Executive Summary. Global Environment Centre, Kuala Lumpur and Wetlands International, Wageningen.
- Minimising Impacts of Palm Oil and Biofuel Production in SE Asia on Peatlands, Biodiversity and Climate Change. Report from the Technical Meeting and Stakeholder Outreach Workshop, 2 November 2007. Kuala Lumpur, Malaysia. Global Environment Centre.

ARCP2007-18NSY-Nawa: Using Clean Development Mechanism (CDM) Opportunities to Mitigate the Release of Greenhouse Gases by Improving Waste Management Practices

Project Leader: Dr. Nawa Raj Khatiwada
Email: nawa@ndri.org.np
Funding: US\$ 40,000 (1 year)
Participating Countries: Indonesia, Japan, Nepal

Improper solid waste disposal is a serious environmental problem and a major source of GHG emissions in Nepal. To address this issue, Nepal Development Research Institute (NDRI), with financial support from the APN, initiated the present project which aimed to address the issue of GHG, waste recycling, CDM



Benefits of composting technology in Nepal

and capacity building together. Results from the field survey revealed that more than two thirds of total waste generated originates from the kitchen indicating a strong potential of composting.

The project envisioned assessing a feasibility study for waste management using composting technology and utilising funds available under the CDM initiative. The activity was relevant to APN in three ways. First, the activity's major focus is on GHGs and climate change, and efforts to reduce the emissions. Second, the project links its results to sustainable development by addressing the CDM and waste recycling themes. Capacity building and awareness aspects in specific relation to municipal authorities and development practitioners were considered the third important element of the project. As part of the project activities, a five-day workshop was convened in Kathmandu, Nepal during 14-20 December 2007. The preparation of documents essential for project proposals to be submitted for CDM funding was the major focus of the event.



Improper solid waste management is a major source of GHG emissions in Nepal

The project effectively contributed to enhancing the capacity of NDRI and involving the researchers. Nineteen out of 58 municipalities in Nepal and 8 municipalities in Indonesia participated in the project activities. They are now aware of the innovative solid waste management options and the funds available under the CDM initiative. The awareness level of policy-makers, municipal authorities and development practitioners was also enhanced through the project activities. The analysis and investigations indicated a need for further empirical research on a few aspects covered under this project.

Key results from the project included:

- ✚ *Per capita waste generation ranged from 0.12 to 0.325 kg and waste generation was up to 65 ton per day in the municipalities.*
- ✚ *Kitchen waste, a major contributor of organic fraction ranged from 51 to 87% in municipalities (average 72%).*
- ✚ *A significant daily variation was observed during the weekends, which may affect the quantity of waste available for composting.*
- ✚ *Annual GHG emission rates ranged from 708 ton CO_{2e} (Ilam) to 20,925 ton CO_{2e} (Biratnagar).*
- ✚ *Although composting was found to be a feasible option for waste disposal, scale economy could be a barrier for project implementation under the CDM framework.*
- ✚ *Showcases of various small-scale disposal options including biogas plants were studied.*

Inspired by the project activities, the Solid Waste Management and Resource Mobilization Center (SWMRMC), an apex body in Nepal, is planning to organise a similar workshop in which representatives from all 58 municipalities are expected to participate. Similarly, Public-Private Partnerships for Urban Environment (PPPUE), Nepal has initiated a baseline survey of "Exploring prospects of a CDM project for Municipal Solid Waste Management (MSWM) in Nepal".

Publication: At the time of writing, one publication, which is to be presented at a conference in 2009, is pending.

ARCP2007-20NSG-Kwon: Development of Indices and Indicators for Monitoring Trends in Climate Extremes and its Application to Climate Change Projection

Project Leader: Dr. Won-Tae Kwon

Email: wonta@metri.re.kr

Funding: US\$ 10,000 (1 year) and Matching funds of US\$ 16,000 from Korea Meteorological Administration [KMA]

Participating Countries: Australia, Bangladesh, Cambodia, China, Fiji, India, Indonesia, Japan, Lao PDR, Malaysia, Mongolia, Nepal, New Zealand, Pakistan, Philippines, Republic of Korea, Russian Federation, Sri Lanka, Thailand, USA, Viet Nam

Anthropogenic climate change is currently recognised as one of the important aspects of global change that threatens future human society and ecosystems. More frequent and intense climate extremes, such as heat waves and flooding, are predicted through international efforts to reduce the expected serious damage and also to protect humankind and the environment from such events. This project, which shows an example of the importance of international collaboration in the Asia-Pacific region, was a continuation of the five APN-funded workshops previously led by Australia. The series of workshops expected to develop adaptation strategies and reduce uncertainty regarding occurrence of extreme climate events in the Asia-Pacific region.



Workshop participants (top) and presentation of each country representatives (above)

Trends in climate extremes based on surface observation data were analysed to monitor significant changes in climate extremes across ten western Pacific countries (Australia, China, Japan, Malaysia, Mongolia, New Zealand, Pakistan, Republic of Korea, Thailand, and Viet Nam). The 20 extreme temperature indices and 10 extreme precipitation indices were examined for the period 1955-2007. In order to synthesise the observed changes in

climate extremes, the 6th Asia-Pacific Network workshop was held in Seoul, 20-23 February 2008.

According to the workshop results, the number of summer warm days/nights based on upper/lower 5th percentile thresholds has increased, while the number of winter cool days/nights has decreased. The numbers of frost and ice days have decreased and those of tropical nights and summer days have increased. On the other hand, trends and intensity of extreme precipitation events are highly variable at the regional scale. This workshop contributed to enhancing the close collaboration among APN member countries and allowed for increasing recognition of the importance of monitoring and understanding climate extremes in relation to global change in the Asia-Pacific region.

Publications: CD-ROMs containing abstracts and presentations in the 6th APN Workshop on Climate Extremes held on 20-23 February 2008 were distributed among the participants during the workshop. At the time of writing, one paper pending publication.

CAPaBLE

Highlights and publications for completed projects under APN's CAPaBLE Programme are included in this chapter of the Annual Report. Further details on any of the projects highlighted in this publication can be obtained by contacting the APN Secretariat at info@apn-gcr.org or visiting the APN website at www.apn-gcr.org.

2005-CB02NMY-Taniguchi: Building Curriculum and Environmental Education Modules for Environmental Ethics

Project Leaders: Prof. Fumiaki Taniguchi and Prof. Azizan Baharuddin

Email: fumiaki@konan-u.ac.jp and azizanb@um.edu.my

Funding: US\$ 70,000 (2 years)

Participating Countries: Japan and Malaysia



Hands-on training session

Environmental Education is implemented as a major approach for sustainable development and involves interaction between the science community, policy-makers and the education sector (primary, secondary & tertiary). In this sense, environmental education is an important approach to materialise one of the APN's goals of linking science and policy. In order to assist in the development and promotion of the knowledge of natural sciences related to global change research, the International Symposia and workshops undertaken in the project aimed to share viewpoints of knowledge and expertise from invited guests in the fields of natural sciences, social sciences, and human sciences.

Studies on environmental education have not yet been sufficiently integrated to solve environmental issues. For having a common understanding of environmental issues based on environmental ethics, internationally recognised guidelines for environmental education need to be established. The symposia and workshops conducted aimed to establish preliminary guidelines and discuss the role of networks in the Asia-Pacific region in environmental education. 'Environmental Education' is embedded into all 'natural, social, and human sciences'.

The project and its activities focused around symposia/workshops: keynote speeches, lectures by leading researchers, panel discussions, hands-on training and workshops, development of materials, establishing an outline for the role of networks in environmental education and dissemination activities. The symposia and workshops in the second year further developed the outcomes of the first set of symposia and workshops.

The symposia resulted in the recognition of the real environment, particularly the indigenous environment, as a means to fill the various gaps among developed countries and developing countries, and among experts, teachers and other stakeholders. The need



Meeting of environmental education specialists

to establish flexible guidelines of environmental education applicable to stakeholders that will cut across all Asian countries was considered crucial to successful implementation.

The project concluded that one way to standardise the guidelines of environmental education is to use a top-down approach and make use of laws and regulations set by central and regional governments for environmental

education, as well as pay attention to international declarations and charters. A second consideration is bottom-up and, in this case, when establishing common guidelines for environmental education, common technical terms should be universally accepted, in order to bridge the “language” gap between specialists and citizens in general. This will further ensure that the process of dialogue among them will be bottom-up on the one hand, while facilitating the full understanding of top-down regulations on the other.

Publications:

- Taniguchi, F. (Ed). 2007. Guidelines for Environmental Education Focusing on Environmental Ethics and Human Dimension of Global Change. *Proceedings of International Symposium Establishing Guidelines for Environmental Education Based on Environmental Ethics (III)*. Kuala Lumpur, Malaysia, 3-4 May 2007: Fuzambo International Printing.
- Taniguchi, F. (Ed). 2007. Guidelines for Environmental Education Focusing on Environmental Ethics and Human Dimension of Global Change. *Proceedings of International Symposium Establishing Guidelines for Environmental Education Based on Environmental Ethics (I) and (II)*. Kobe, Japan. 28-30 January 2006 and Bangkok, Thailand. 17-21 August 2006: Fuzambo International Printing.

2005-CB06NMY-Ali: Socio-Economic Impacts and Lessons from the Management of Social Forestry Program in Bangladesh

Project Leader: Dr. Quazi Liaquat Ali
Email: liaquat@bangla.net
Funding: US\$ 20,000 (2 years)
Participating Countries: Bangladesh



Planting activity

The forestry sector is an important sector in Bangladesh and plays a significant role in meeting the diversified needs of the people, their socio-economic development and conservation of the environment. The depletion of forest resources is a common phenomenon severely threatening

our food and energy security as well as the quality of life. The people of Bangladesh have already been adversely affected both economically and environmentally due to the degradation of forest resources. Though forest products are massively harvested, there remains a wide gap between supply and demand. In another way, this gap is widening steadily with passing time due to increasing population and decreasing forestry resources. Due to progressively reduced supply and increasing cost of fuel wood, farmers are compelled to burn crop residues and animal dung to meet household fuel energy, which otherwise could have been recycled to replenish or augment soil organic matter. This has a direct bearing on the progressive deterioration of soil health and the environment. Under this scenario, social forestry has become a viable option to combat the whole range of issues for the present and coming centuries.



SFP beneficiary lifting water by tube-well and conserving in a dig for irrigation purposes

The role of social forestry in rural development and balancing environment has drawn the attention of the Government of Bangladesh. With the recognition of contributions of social forestry, the Bangladeshi Government has given top most national priority for planting trees at roadsides, in farmland, homesteads, and any other vacant lands/places. Different approaches particularly participatory forestry and social forestry programmes have been followed for the last three decades and, during this period, a number of government programmes were implemented. However, along with the positive views, a number of impediments from implementation to harvesting and share distribution stages were reported. As such, the social forestry programme (SFP) and its benefits and impacts among its participants and society as a whole, required a critical evaluation for its better management and maximum benefit.

The income of the programmes and establishment of income generating activities using the benefits of SFPs have given beneficiaries a new status in their families and societies through considerable access to pure drinking water, sanitation, health and education; improvement in housing patterns over time; advancement in intake of quality food and improvement in confidence, awareness, decision-making and empowerment. The governance of the programmes was somehow satisfactory without few exceptions. The beneficiaries expressed their satisfaction regarding transparency in the payment of wages, provision of training and technical assistance for plantation establishment and management.

The study proved that SFPs have significantly contributed towards tree resource development outside the forest land, technical knowledge development of the rural poor and socio-economic development of its beneficiaries, but several problems were documented that negatively affected the programmes as well. Significant problems included conflicts between landowners adjacent to the plantations and the beneficiaries; inadequate management practice (irrigation, thinning, pruning); weak cooperation and support from local government for protection, insufficient organisational training and the

bureaucratic process in tree harvesting/disposal; lack of functional coordination and collaboration between or among the agreed parties and other concerned agencies (Union Council, Thana Nirbahi Officers Office, Deputy Commissioners Office and Forest Department, etc.).

However, concerned stakeholders strongly believe that interventions on those issues would be highly effective in improving and sustaining the programme, protecting the environment, alleviating poverty and contributing more towards socio-economic development of its beneficiaries as well as society as a whole.

Publication:

- Ali, Q.L., Khair, A. and Miah, G. 2008. Socio-economic Improvement of Beneficiaries through Management of Social Forestry Program of Proshika. Journal of Socio-economic Research and Development, 2(5), 444-450.

CBA2007-01CMY-Bambaradeniya: Removing Barriers to Capacity Building in Least Developed Countries (LDCs): Transferring Tools and Methodologies for Managing Vulnerability and Adaptation to Climate Change

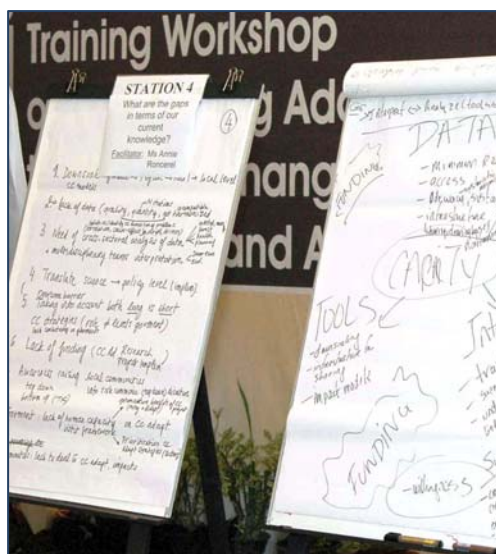
Project Leader: Dr. Channa Bambaradeniya

Email: cnb@iucnsl.org

Funding: US\$ 60,000 (2 years; with United Nations Institute for Training and Research [UNITAR] and UNFCCC matching funds)

Participating Countries: Bangladesh, Cambodia, Indonesia, Lao PDR, Malaysia, Mongolia, Nepal, Pakistan, Sri Lanka, Viet Nam

Developing country policy-makers, climate change negotiators and Non-Governmental Organisations (NGOs) attending IPCC negotiations have limited capacities to relate global thinking with local actions. It is essential that they also understand the methodologies and techniques for assessing the impacts of climate change during the negotiations even if the actual scientific assessments could be carried out by the trained scientific community. In most Conference of Parties (COP), representatives from developing countries are at loggerheads when it comes to interpreting and assessing technically available climatic data. Additionally, these policy-makers do not have multi-sectoral training to understand the implications and cross-linkages of climate change in various sectors. Considering this, the present project conducted a regional workshop for LDC member states of Southeast Asia (Lao PDR, Cambodia and Viet Nam). This workshop was intended to build capacity and train policy-makers, researchers and NGOs for understanding issues of vulnerability and adaptation to changing climate, and impart relevant knowledge and state of art training to all stakeholders in the use of relevant tools and technologies. Using the funds received from APN, The World Conservation Union (IUCN) was able to leverage additional funding



Workshop outputs

through fruitful collaboration, which enabled upscaling of the workshop to a wider group, including 10 APN member states in Asia. UNFCCC and UNITAR were also partners in the activities and sufficient funding was leveraged by these organisations to include both Asia and Africa.



Field visit after the training workshop

The project translated global thinking into local actions through building scientific capacities of local governments by way of transferring technologies and methods to a range of stakeholders for assessing vulnerability and adaptation to the global change process at local levels. The trans-regional consultative workshop laid emphasis on community-based adaptation approaches, encouraged ground level consultations and multi-stakeholder analyses to disseminate tools and technologies for vulnerability assessments, thus complementing the APN Science and Policy Agendas on global change research.

It was clear that there are many opportunities to design and implement community-based climate adaptation strategies related to sectors such as water, energy, health, agriculture and biodiversity. Several projects have already been implemented in LDCs in Asian and African regions, which offer opportunities to learn lessons, and improve the implementation of future projects.

The following key points were emphasised by participating countries, in relation to climate change adaptation:

- ✚ *The need to integrate community-based climate adaptation strategies into national development programmes and stress the value of sharing lessons learnt through pilot projects.*
- ✚ *The need to provide adequate funds to support the implementation of adaptation programmes.*
- ✚ *The need to establish and operationalise an Adaptation Fund as soon as possible.*

Publications:

- *Resource Kit on Climate Change Adaptation* [in CD-ROM]. The World Conservation Union, Ecosystems and Livelihoods Group Asia, Colombo, Sri Lanka.
- Bambaradeniya, C. 2008. Proceedings of Training Workshop on Developing Adaptation Strategies to Climate Change for Asia and Africa Region Yogyakarta [in CD-ROM]. 30 October – 2 November 2007.
- Bambaradeniya, C. 2008. Best Practice Guidelines and Lessons Learnt Related to Community-based Adaptation Strategies [In CD-ROM]. Resources Materials.

CBA2007-03NSY-Nunn: Understanding Environmental Decision-Making in the Rural Pacific Islands

Project Leader: Prof. Patrick Nunn

Email: nun_p@usp.ac.fj

Funding: US\$ 43,000 (1 year)

Participating Countries: Cook Islands, Fiji, Kiribati, Vanuatu



Eroding shoreline in Kiribati

For more than 20 years, climate-change assistance to Pacific Island Countries (PICs) has been predicated on the assumption that the most effective ways to raise preparedness is top-down, largely by influencing national policy and bringing it into line with international agendas. This research project was intended to understand the effectiveness of this approach by learning exactly how decisions regarding the environment and its changes were made. The approach taken was to target representative communities with experience in addressing climate-change linked decisions in representative countries of the Pacific islands region.

Within the four PICs selected, representative settlements were chosen on the basis of their exposure to climate-linked environmental change, their rural (non-urban) location, and the likelihood that they would experience increased pressure in the next few decades from climate change. Informants were sought and were able to discuss the nature of the environmental decisions the communities had to deal with, the nature of the information sources to which they referred the ranking of these in order of importance, and their understanding of global change. Data gathered from all these communities in each country were processed and analysed.



Chief Mahuri, key informant at Lolbualabwa Village, Pentecost Island, Vanuatu

It is clear from the research project that national policy has little or no influence on most decisions undertaken with reference to the environment in rural parts of the Pacific Islands. In fact, there is very little evidence that such decisions pay attention to science or other sources of insights concerning climate change. Most such decisions are made based on emulation, experience, and inferred best practice. This is not a satisfactory situation for any organisations like APN that seek to develop strategies to minimise the undesired impacts of climate change in vulnerable parts of the world like the smaller countries of the Pacific Islands region. The suggested way forward is to engage community-level 'persons of influence' and ensure that they are given the knowledge needed to make and sustain sensible decisions about the environments over which they have control well into the future.

It is important to continue to understand the pathways of environmental decision-making in regions like the rural parts of the Pacific Islands. The main reason is that much of the aid for climate change that reaches the developing world is earmarked for policy development, on the assumption that national policy is the best way to effect change across such a country. The research from this project suggests otherwise. One future project might look at ways in which community-level environmental decision-making in the Pacific Islands could be improved, made more consistent (from one place to another), and sustained into the future. Improvements could come from making national policy and science agendas more accessible and more intelligible to community-level decision-makers.

Publications: In addition to the two manuscripts that are currently under preparation, the following Keynote Addresses were made:

- Nunn, P.D. 2008. Assisting Pacific Island Nations Meet the Challenges of Climate Change. Keynote Address. International Symposium on the Environment and Assistance to Pacific Island Countries, 17 July 2008, Tokyo, Japan.
- Nunn, P.D. 2008. Climate Change: A Janus-faced Challenge for Our Times. Keynote Address. 2008 International Association of Marine Science Libraries and Information Centers (IAMSLIC) Conference, 15 September 2008, Suva, Fiji.
- Nunn, P.D. 2008. New Directions for Managing the Challenges of Climate Change in the Pacific Islands. Keynote Address. Pacific Climate Change Roundtable, 14 October 2008, Apia, Samoa.

CBA2007-04NSY-iino: Developing Chemical Analysis Capability (for POPs) in India and Pakistan and Risk Perception of Policy-Makers and People in Asia

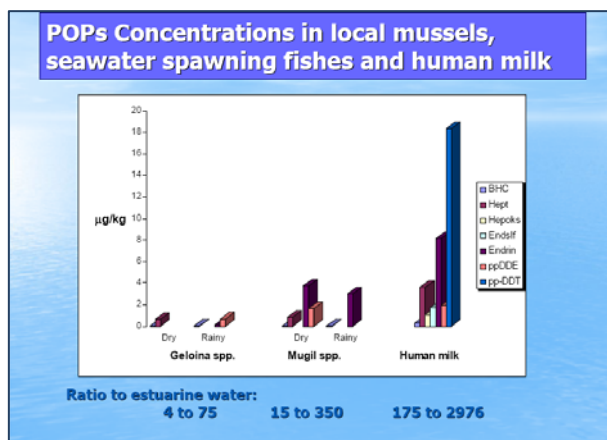
Project Leader: Dr. Fukuya iino

Email: iino@hq.unu.edu

Funding: US\$ 24,000 (1 year)

Participating Countries: India, Indonesia, Japan, Pakistan and Russia

The main objective of this project was to provide basic training necessary for scientists in India and Pakistan to initiate their own efforts for enhancing Persistent Organic Pollutants (POPs) analysis capacity and to disseminate POPs-related information in Asia. Another objective was to disseminate to stakeholders in Asia project results and risk perception concepts, which are important for policy-makers to know in formulating such chemical pollution-related policies. Two project trainees from India and Pakistan received POPs analysis training at the Korean Ocean Research Development and Institute (KORDI) that was organised as part of Asia-Pacific Economic Cooperation (APEC) activities.



Slide from a symposium presentation on POPs and risk perception

A project symposium was held in Indonesia with more than 160 participants. Three international speakers (Australian researcher on Dioxin formation from forest fire, Swiss researcher on risk perception, and Japanese researcher on POPs management) and one University Support to Environmental Planning and Management (USEPAM) project key personnel from Denmark (Danish International Development Agency [DANIDA]-supported project with the Asian Institute of Technology (AIT), were invited to the symposium to share their expertise and to network with symposium participants and project partners. A project expert visited the Indian partner for a follow-up onsite activity and provided a series of lectures at a chemical analysis workshop involving academic researchers as well as governmental technical staff members. His visit to Pakistan was postponed due to unforeseen circumstances.



Presentation on best environmental practice and risk perception

The training component of the project was designed to develop scientific capacity and sound chemical management in two emerging developing countries in South Asia. Acquiring domestic capability on how to measure POPs is a basic step for policy-makers in developing countries in collecting data and taking action to reduce POPs release to the environment. All countermeasures planned for POPs reduction in agriculture, industries, and social infrastructures, without the capability to pinpoint where, how much, and which POPs are being released, would simply result in wasting resources, which could be used to improve other aspects of sustainable development. Following project completion, both are now embarking on career-oriented initiatives in their respective countries.

The symposium in Indonesia, which focused on POPs and risk perception, received more attention than expected, and the discussion following the presentations was very active. The feedback from the symposium participants in the form of surveys emphasised the importance of such an event held for the general public with strong interests in the related topics. The only point that could have been improved was to have another presentation on Best Environmental Practice for people who are not familiar with the concept adopted by the Stockholm Convention. This concept was introduced during the closing remark by the project leader touching on haze issues as one of the critical regional environmental issues in Asia.

The project partners and trainees in India and Pakistan have learned analytical skills, which were applied for collecting field data. Although a lack of well-trained human resources in the project partner institutes is an issue, the laboratories are expected to disseminate their monitoring data and function as regional centers of expertise on environmental pollutant analysis. The capacities built through this project will be highly expected to aid their governments in implementing their National Implementation Plans that will be submitted to the Stockholm Convention Secretariat.

Publication:

- *Proceedings of United Nations University (UNU) Symposium Proceedings on POPs: Global Transport, Best Environmental Practice, and Risk Perception*, 14 November 2007. Available on the website indicated in the previous page.

CBA2007-05NSY-Kelkar: New Risks of Climate Change – Building Capacity to Protect the most Vulnerable

Project Leader: Ms. Ulka Kelkar

Email: ulkak@teri.res.in

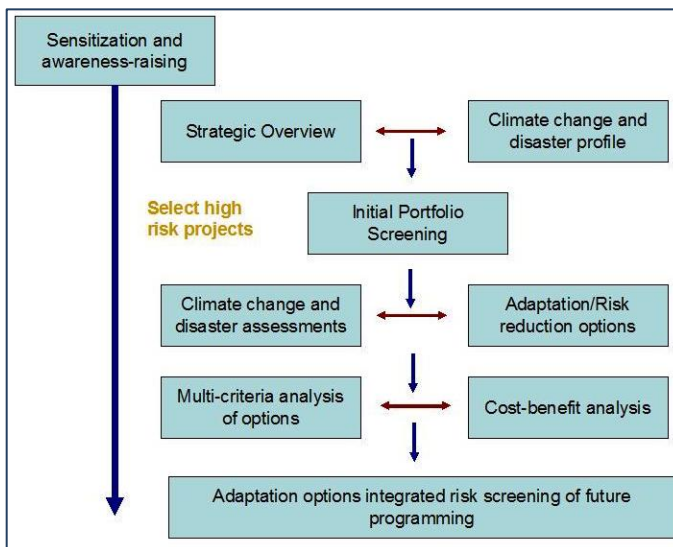
Funding: US\$ 20,000 (1 year)

Participating Countries: India

Scientific research indicates that climate change may result in intense and frequent extreme weather events such as hurricanes, acute heat waves, floods in some areas and drought in others. This may also trigger natural disasters, such as tsunamis, disease outbreak etc, more frequently. Global sea levels are predicted to rise up to three feet by 2100, threatening regions at or below this rise in sea level (IPCC, 2007). Climate change is often viewed as a gradual, progressive, and long-term phenomenon but past climate and disaster history will no longer be a good benchmark and future changes could be non-linear and abrupt. This change would be manifested not just in terms of a change in averages but also in terms of increasing variability.

It is expected that climate change will further aggravate its impacts in developing countries, whose economies are closely tied to climate-sensitive sectors like agriculture, and which are already facing multiple stresses due to population growth, urbanisation, industrialisation, and globalisation. In the tropics and subtropics, where some crops are already near their maximum temperature tolerance and where rain fed agriculture dominates, yields are likely to decrease for even small changes in climate, which could lead to increased risk of hunger. Often, the poorest in rural areas occupy the most marginal lands and this forces people to rely on highly vulnerable livelihoods in areas prone to drought, flooding, and other hazards. Developing countries also lack the financial mechanisms and technical resources to effectively defend themselves against natural disasters (IPCC, 2001). Thus, regions and communities that are unable to cope with current climate hazards are also likely to be the most poorly equipped to cope with the adverse impacts of climate change (Adger et al., 2003).

The first step towards meeting the challenges posed by climate change is to create awareness among civil society and policy-makers about probable impacts of climate



ORCHID process to screen and assess climate risks inherent in DfID's programmes and decision-making for a climate robust adaptation option

Source: Tanner et al, 2007

change, its causes, possible consequences and what can be done to mitigate it. This study was particularly aimed at enhancing existing capacities of policy-makers and practitioners not directly dealing with climate change issues on various aspects of climate change science, relevant information about factors responsible for adverse change in atmosphere, sectoral impacts and institutional responses that can be integrated effectively through policy-making framework.

After compiling relevant studies and success stories from developing countries, an appropriate framework was developed for a web-based portal. The prototype of the portal was initially launched for feedback from stakeholders (both policy-makers and practitioners) during Delhi Sustainable Development (DSDS) in February 2008. The results are being put together for dissemination on a new portal being prepared by The Energy Resources Institute (TERI) as part of the bigger programme. The name of the portal will be 'climate of concern' and is still to be uploaded in the public domain.

The outcome of this study is a comprehensive web-based database and tools to inform and prepare policy-makers for effective responses and measures, both at macro and micro levels. This study identified tools and techniques that can enable and strengthen the policy-making processes and practitioners to understand issues related to climate change, with the help of the following web-based packages:

- ✦ *Understanding climate change and impacts*
- ✦ *Climate risk screening methods*
- ✦ *Building coping strategies*
- ✦ *India's action on climate change*
- ✦ *Vulnerability index and hotspot mapping*
- ✦ *Addressing issues of burden sharing, equity and ethics of climate change*
- ✦ *Understanding the Southern perspective for Adaptation and Mitigation*
- ✦ *Mitigation and CDM: facts and figures*
- ✦ *Information and Communication Technology (ICT) for awareness and capacity building for enhancing adaptive capacities of vulnerable communities*

Publication:

- Kelkar, U. 2008. New Risks of Climate Change – Building Capacity to Protect the Most Vulnerable: Modular web-based learning package [in CD-ROM].

CBA2007-07NSY-Wang: Workshop on the “The Monsoon System: Prediction of Change and Variability”

Project Leader: Prof. Bin Wang
Email: wangbin@hawaii.edu
Funding: US\$ 50,000 (1 year)
Participating Countries: China, India, Malaysia, Pakistan, USA



Workshop participants and lecturers

Despite the enormous significance of change and variability in the Asian monsoon system for human activities, an inadequate number of scientists in the APN region have up-to-date knowledge of recent advances in monsoon science. To rectify this situation, the Advanced Institute on “The Asian Monsoon System: Prediction of Change and Variability” was conducted on 2-11 January 2008 at the East-West Center, located at the University of Hawaii, Manoa. Participants were twenty early career scientists from the Asia-Pacific region, selected through a competitive application and review process from a pool of 98 applicants, from many APN member countries including, China, India, Indonesia, Republic of Korea, Malaysia, Nepal, Pakistan, Philippines, Sri Lanka, Thailand, USA, and Viet Nam. Lecturers at the institute were prominent senior monsoon scientists from many APN countries, including USA, Japan, Republic of Korea, China and India. The young participants and lecturers interacted through a series of lectures, discussions and social activities that fostered research network development, knowledge and idea exchange, and ideas/proposals for future collaboration. Specific activities focused on:

- Review of latest advances in Monsoon science, especially in relation to variability and predictability of the Asian monsoon, associated hydrological cycle and other key factors affecting monsoon system including GHG emissions and aerosols.
- Practical hands-on experience with accessing and use of a comprehensive data and information system related to Asian monsoon based at the University of Hawaii.
- Formation of sub-groups on inter-seasonal, intra-seasonal and longer term variability of the monsoon and development of ideas/proposals for longer-term collaborative research.
- Awareness of and involvement in international science programs of World Climate Research Programme (WCRP) such as Climate Variability and Predictability (CLIVAR) and Global Energy and Water Cycle Experiment or (GEWEX).

The effort fully achieved all objectives. Early career scientists from APN member countries were brought together to exchange ideas, develop their networks, and learn about the latest data and methodologies used to study the Asian monsoon system. Human resource capacity was enhanced, a regional research network was developed and key institutions in the APN-region engaged in collaboration for future research on the variability and prediction of the Asian monsoon system. A list-serve of all participants and senior scientists is active and enables frequent communication and exchange of ideas. Selected

young scientists' perspectives on the training workshop have been reported on pages 48-49 of this annual report.

Publications:

- Wang, B., Virji, H. and Boos, B. 2008. The Monsoon System: Prediction of Change and Variability (CBA2007-07NSY-Wang). *Asia-Pacific Network for Global Change Research (APN) Newsletter*, Volume 14, Issue 2, April 2008, (<http://www.apn-gcr.org/en/products/nl/2008/April2008%20Newsletter.pdf>)
- Wang, B., Virji, H. and Boos, B. 2008. Advanced Institute on the Asian Monsoon System: Prediction of Change and Variability. Workshop Summary. Honolulu, Hawaii, USA, 2-12 January 2008. Available at: http://www.clivar.org/organization/aamp/documents/Monsoon_Institute_Summary.pdf
- Workshop materials are also available on the institute website: <http://www.start.org/Monsoon2008/home.html>

CBA2007-08NSY-Gordov: Capacity Building to Study Interrelations between Atmospheric Composition, Anthropogenic Load and Climate Change in Northern Asia

Project Leader: Dr. Evgeny Gordov

Email: gordov@scert.ru

Funding: US\$ 38,000 (1 year)

Participating Countries: Japan and Russia

The project aimed at engaging the regional research community, especially young scientists, in a professional activity in the area of experimental and theoretical studies of atmospheric composition, air quality and their interrelations with anthropogenic load and climate change in Northern Asia. As an initial step, an international workshop on Atmospheric Composition and Air Quality was organised in Tomsk, 20-22 July 2007.



Young scientists performing practical tasks on air quality modelling

To continuously support this activity, the project launched a dedicated website as an information system aimed at educating/training young scientists in this domain and integrate it into thematic educational resources, specially prepared based on the Workshop materials, including tutorials on selected topics of basics and applications of Atmospheric Chemistry and Physics of Climate. This transformed the website into a powerful instrument for young scientists' training and a platform for dissemination of environmental information to local population and decision-makers.

The Workshop was organised and held within the framework of an educational event Computational Information Technologies for Environmental Sciences (CITES) 2007 in Tomsk, 14-25 July 2007. This biannual (<http://www.scert.ru/en/conferences/>) 11-day international event comprised a Young Scientist School and Conference on CITES. Sixty



CITES participants during the lecture

young participants from NIS, Asian and European countries were selected on a competitive basis to participate first in the six-day school.

Publications:

- *Proceedings of International Conference and Young Scientists School on Computational Information Technologies for Environmental Sciences: "CITES-2007"* [in CD-ROM], 14-25 July 2007, Tomsk, Russia.
- All materials of CITES-2007 are available at: <http://www.scert.ru/en/conferences/cites07/materials/>.
- Project Thematic Educational Resources available at: http://project.enviromis.scert.ru/apn/Thematic_Educational_Resources/
- Project Thematic Educational IT Tools available at: <http://project.enviromis.scert.ru/apn/tools/>

CBA2007-09NSY-Soejachmoen: Capacity Building in Asian Countries on Climate Change Issues Related to the Future Regime

Project Leader: Dr. Moekti Handajani Soejachmoen
Email: kuki@pelangi.oe.id
Funding: US\$ 45,000 (1 year)
Participating Countries: China, Bangladesh, India Indonesia, Japan, Thailand



Country briefing papers from Bangladesh, China, Indonesia and Thailand

The first Commitment Period under the Kyoto Protocol takes place in the period of 2008-2012. A number of activities to achieve the ultimate objective of the UNFCCC have been introduced and undertaken under the Kyoto Protocol since February 2005. However, further stringent actions are needed beyond 2012. This project aimed to increase the capacity of research institutes and negotiators in developing countries, namely Indonesia, Thailand, India, Bangladesh and China, in participating in the international climate

negotiation. This is a continuation of the APN2005-25NSY project entitled *Capacity Building in Asia and the Pacific on Issues Related to Future Actions on Climate Change*.

The project consisted of three work streams. The first work stream was a research activity in Indonesia, Thailand, Bangladesh, India and China to increase the quality of information, including the exchange and production of information, within the region. The second work stream was conducted through national and regional dialogues to allow exchange and sharing of information in a non-negotiation ambience to increase the capacity of negotiators and policy-makers. The third work stream was conducted to share the view from the region to the rest of the world through a number of briefing papers and public sessions.

The project resulted in a series of interactive discussions and learning processes for both researchers and stakeholders involved, i.e. negotiators, in each country. In a number of involved countries, the in-country dialogues and briefing papers contributed significantly to the preparation of the country's positions and submissions to the UNFCCC process. A recommendation from the project team, which was distributed during the COP13/MOP3, also provided input to the negotiation process that resulted in the Bali Action Plan and other decisions related to future negotiations, which was referred to as the *Bali Road Map* by the COP13/MOP3 President. It is expected that the increased capacity of involved research institutes will enhance the capacity of developing countries negotiators to be actively involved in the international climate negotiations, especially those related to the future regime.

Publications:

- Country Reports and Brief Papers available at: <http://www.beyond2012.org/?show=publications>
- *Policy Brief Paper on Recommendation to the Bali Meeting*. 26 January 2008. Available at: http://www.beyond2012.org/?show=publications&detail=1&publications_id=12

SPECIAL REPORT

Phase 1 of the Comprehensive Research Pillar of the CAPaBLE Programme

Focus: Climate Change Adaptation and Mitigation

The two comprehensive research projects conducted under Phase I of the CAPaBLE Programme, referenced 2005-CRP01CMY-Khan and 2005-CRP02CMY-Shukla, were based on outputs from Working Groups II and III of the IPCC Third Assessment Report. An evaluation (August 2008) of these projects, which focused on modelling aspects for adaptation and mitigation, indicated that they were well conceived and implemented, largely successful, and delivered excellent outputs as a result of careful planning and structuring, the experienced scientists involved and the ability to cooperate across national borders in issues that are relevant to the region. The results and outputs follow below.

2005-CRP01CMY-Khan: 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

Project Leader: Dr. Arshad Khan
Email: arshad.khan@gcisc.org.pk
Funding: US\$ 300,000 (3 years)
Participating Countries: Bangladesh, Nepal and Pakistan



Glacial Lake, Kathmandu, Nepal

Until recently, a major weakness of Pakistan and other South Asian countries in the field of climate change research has been their lack of expertise and experience in the area of simulation modelling. The Global Change Impact Studies Centre (GCISC), Pakistan and its collaborating partners: Pakistan

Meteorological Department (PMD); Department of Hydrology and Meteorology (DHM), Nepal; and Bangladesh Unnayan Parishad (BUP) were very fortunate to win one of the first two long-term projects awarded by APN under its CAPaBLE programme. This project has played a key role in making the scientists from Pakistan, Nepal and Bangladesh active members of the world community of climate change researchers.

The motive for the current project was the realisation that the biggest weakness of most of the South Asian countries in the area of climate change research is the lack of expertise and experience in the development and use of mathematical models for assessment of the impact of global climate change on the climate of their respective country and its sub regions and the corresponding impacts on various socio-economic sectors. Due to this weakness, these countries have so far not been able to make much headway in the area of climate change research. The present project was therefore designed with a strong capacity enhancement element for understanding the operation, use and validation of mathematical models for climate change research.

The project helped to impart training to 99 scientists from the three beneficiary countries in the fields of Regional Climate Modelling (RCM), Watershed Simulation Modelling (WSM), Crop Simulation Modelling (CSM), and the Development of Regional climate change (CC) scenarios, with a minimum of four persons from each country benefiting from each of the four training activities conducted for this purpose.



This enhanced capacity was effectively utilised to varying degrees by the three countries to pursue envisaged research on:



Climate-Modelling training sessions, Pakistan (left) and Thailand (above)

- Implementation, validation and calibration of a variety of RCMs, WSMs and CSMs;
- Development of coarse and fine resolution CC scenarios for the three countries;
- Assessment of the impacts of expected CC on annual and seasonal flows of their main rivers and on the yields of major crops in different agro-climatic zones; and
- Identification and evaluation of appropriate adaptation measures and coping mechanisms to counter the negative impacts of CC.

Two regional workshops were held during the last three months of the project tenure to discuss the research results and to review and harmonise the draft technical reports and, in the last two weeks of the project tenure, two national level seminars were held, one in Kathmandu and the other in Islamabad, to brief national planners and policy-makers in Nepal and Pakistan about the capacity building achievements and research findings of the project. The chief guests at both these seminars were the respective heads of National Planning Commissions, while the audience comprised senior and middle level professionals from various relevant ministries, government departments, NGOs and international organisations. The project outcomes were appreciated by the heads of the Planning Commissions in Nepal and Pakistan, who emphasised that this type of research is highly relevant to the countries of the South Asia region whose water and food securities are at great risk due to global climate change.

Several of the research activities initiated during the project activities are ongoing and will continue over the foreseeable future. The work has already resulted in the publication of 2 monographs, 4 research papers in international journals/books, 3 papers in national journals, 8 workshop proceedings and 21 draft reports, while a few more are in the pipeline. Besides, 71 research papers were presented at various international conferences and 21 at national level conferences.

Selected Publications:

- Hussain, S. S. and Mudasser, M. 2007. *Prospects for Wheat Production under Changing Climate in Mountain Areas of Pakistan – An Econometric Analysis*. *Science Direct, Agricultural Systems*, 94(2), 494-501.
- Pal, J., Giorgi, F., Ashfaq, M., Saiyed, F. et.al. 2007. *Regional Climate Modeling for the Developing World: The ICTP RegCM3 and RegCNET*. *Bulletin of the American Meteorological Society*, September 2007, 1396-1409.
- Amir, P. and Munir Sheikh, M. 2006. *Droughts in Pakistan: Causes, Impacts and Remedial Measures*. In Muhammad, A., Monirul, M., Mirza, O. and Stewart, B. (Eds), *Climate and Water Resources in South Asia: Vulnerability and Adaptation (78-94)*. Asianics Agro Dev. International/APN/START/HIWP.
- Saeed, S., Munir Sheikh, M. and Faisal, S. 2006. Simulations of 1992 Flood in River Jhelum Using High Resolution Regional Climate Model, PRECIS to Study the Underlying Physical Processes Involved in the Extreme Precipitation Event. *Pakistan Journal of Meteorology*, 3 (6).
- Syed, F., Giorgi, F., Pal, J., and King, M. P. 2006. *Effect of Remote Forcings on Winter Precipitation of Central Southwest Asia Part 1: Observations*. *Theoretical and Applied Climatology*, 86, 147-160.
- Hussain, S., Muddasser, M., Munir Sheikh, M., and Naeem, M. 2005. Climate Variability in Mountain Areas of Pakistan - Implications for Water Resources and Agriculture. *Pakistan Journal of Meteorology*.
- Climate Change: Global and OIC Perspective. 2004. Global Change Impact Studies Centre (GCISC), Pakistan.
- Energy Strategies for the OIC Member States. 2004. Global Change Impact Studies Centre (GCISC), Pakistan.
- Syed, F. and Younas, A. 2004. Variation in Fog Intensity/Duration and El Nino. *Pakistan Journal of Meteorology*, 1 (1), 1-49.



Project Leader (middle) and collaborators in Nepal. Far left is Madan L. Shrestha, project collaborator and APN SPG Member for Nepal

2005-CRP02CMY-Shukla: Integrated Assessment Model (IAM) for Developing Countries and Analysis of Mitigation Options and Sustainable Development Opportunities

Project Leader: Prof. P. R. Shukla

Email: shukla@iimahd.ernet.in

Funding: US\$ 300,000 (3 years)

Participating Countries: China, India and Thailand

The project theme of integrated assessment models for developing countries and analysis of mitigation options and sustainable development emerged from recommendations of various international assessments on long-term global environmental issues, especially by the IPCC, which showed gaps in quality and capacity of assessment for developing countries in the area of policy modelling. Two broad themes were identified as vital in this context. First, the development of tools for policy analysis in order to integrate climate

change and sustainable development concerns of developing country policy-makers. Second, the enhancement of capacity in developing countries for integrated assessment of climate change mitigation options in the context of sustainable national development priorities and policies.

The project was jointly implemented by three institutions, namely, Indian Institute of Management, Ahmedabad (IIMA), India; Energy Research Institute (ERI), China and Asian Institute of Technology (AIT), Thailand. The project work was organised around three themes: 1) development of national scenarios with developing country perspective; 2) explicit recognition of developing country dynamics in the modelling, 3) initiation of national modelling exercises and development of national databases in the three participating countries. The project teams carried out activities both jointly and independently.

The joint activities included designing model framework, database and application outlines. Besides, each country team developed national scenarios and policy modelling in the context of national development plans and greenhouse gas mitigation. The dissemination and project level coordination was done via a comprehensive website (www.e2models.com) which displays intellectual resources related to the project domain including an inventory of papers, and presentations. The website has received excellent feedback from researchers and other stakeholders in terms of its design, relevance of materials and comprehensiveness. The website includes the publications and presentations linked to project activities.

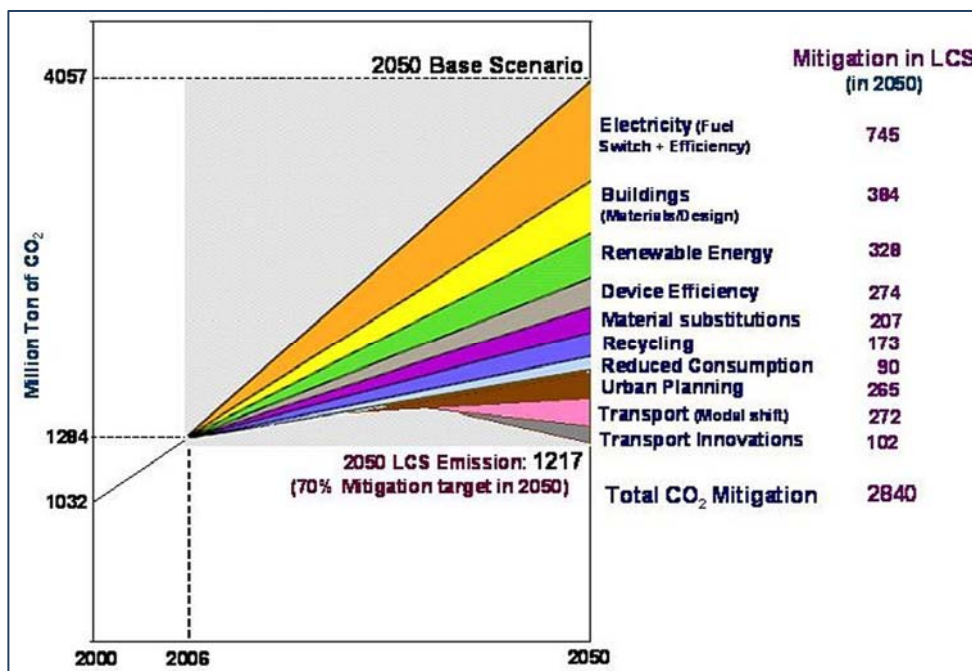
Three project workshops were held (AIT, Bangkok in August 2004; ERI, Beijing in September 2005; IIM, Ahmedabad in March 2007) with participation of diverse stakeholders. The project work has led to numerous publications. The project outcomes are interfaced with various international environmental assessments by the project team members participating in the activities such as IPCC AR4, GEO 4, Asia-Pacific Environment Innovation Strategy (APEIS), and Development and Climate project led by United Nations Environment Programme (UNEP) RISO Centre on Energy, Climate and Sustainable Development, Denmark.

The key output of the project is the **CAPaBLE CGE Model**, which is reported in full in the 'Model Report'. This is available from the Project Leader or from the APN Secretariat. The



Presentation on climate change mitigation related issues

model applications were made for China, India and Thailand, which show the model as a very useful tool. The project identified generic databases, which users from developing countries can access free from the web, and specific databases, which more advanced users, may subscribe. The project paid keen attention to capacity building training more than



Low carbon society scenario for India: Sustainable portfolio of measures

15 doctoral and post-doctoral students, disseminating information to diverse stakeholders from several developing countries from Asia-Pacific region.

The project website was used effectively for access to project outputs. Throughout the project implementation, the interfaces were maintained with various international environmental assessments. Project work has led to numerous publications which has helped capacity building of researchers in developing countries. The project partners contributed to the formation of the Asian Energy and Environment Modelling Forum (AEEMF), which was established in July 2004. An important outcome of the project is an extended network among the modelling and climate change mitigation researchers in the Asia-Pacific region and establishment of fresh links with international research networks.

Four key areas for further work are: 1) enhancing the model developed for the present CAPaBLE project comprehensive to a global model which can align global sustainable development and climate change mitigation in an integrated framework for developing roadmap for transition to a future 'Low Carbon Society'; 2) developing strategic technology database for supporting the model for the long-term technology strategy involving innovations and their transfers and deployment in developing countries; 3) disseminating project work through targeted workshops as well as available forums; and 4) sustaining the research network in the Asia-Pacific region and links with international networks. In the context of the last two areas, the project website will be continued beyond the project duration. There are also plans to convert the final outputs from the project to various publications for wider dissemination.

Selected Publications:

- Jiang, K. and Hu, X. Energy Demand and Emissions in 2030 in China: Scenarios and Policy Options. *Environment Economics and Policy Studies*. (accepted)
- Garg, A., Shukla, P.R., Kapshe, M. 2007. From Climate Change Impacts to Adaptation: A Development Perspective for India. *Natural Resources Forum*, 31 (2007) 132-141.
- Garg, A., Shukla, P.R. and Kapshe, M. 2006. Multigas Emissions Inventory of India: Sectoral and Regional Trends. *Atmospheric Environment*, 40, 4608-4620.
- Jiang, K., Hu, X. and Zhu, S. 2006. Multi-Gas Mitigation Analysis by IPAC. *Energy Journal* [Special Issue Number 3], 420-438.
- Menon-Choudhury, D., Shukla, P.R., Biswas, D. and Nag, T. 2006. Electricity Reforms, Firm Level Responses and Environmental Implications In Kalra, P.K. and Rue,t J. (Eds), *Electricity Act and Technical Choices for the Power Sector in India* (pp. 183-216). Manohar.
- Shukla, P.R. 2006. India's GHG Emission Scenarios: Aligning Development and Stabilization Paths. *Current Science*, 90 (3), 354-361.
- Shukla, P.R., Garg, A., Kapshe, M., and Nair, R. 2006. India's Non-CO₂ GHG Emissions: Development Pathways and Mitigation Flexibility. *Energy Journal* [Special Issue Number 3], 461-483.
- Shukla, P. R., Rana, A., Garg, A., Kapshe, M., Nair, R. 2006. Global Climate Change Stabilization Regimes and Indian Emission Scenarios: Lessons for Modeling of Developing Country Transitions. *Environment Economics and Policy Studies*, 7(3), 205-231.
- Jiang, K. and Zhu, S. 2005. Analysis on Policy Options for Promotion of Clean and Energy Efficient Technologies in Transport Sector in Beijing. *International Journal of Environment and Pollution*, 27 (7).
- Jiang, K., et. al. 2005. Chapter 17. In *China's Climate Change Review and Assessment*. China: China Metrological Publishing House, Beijing.
- Malla, S. and Shrestha, R. M. 2005. *Implications of Carbon Tax and Energy Efficiency Improvement on Thai Economy* (Research Report). Asian Institute of Technology, Thailand.
- Malla, S., Shrestha, R. M. and Kumar, S. 2005. *National Level Energy and Emission Scenarios Development for Thailand* (Research Report) Asian Institute of Technology, Thailand.
- Shukla, P.R., Nag, T. and Biswas, D. 2005. Electricity Reforms and Firm Level Responses: Changing Ownership, Fuel Choices and Technology Decisions. *International Journal of Global Energy Issues*, 23 (2, 3).
- Shukla, P.R., Sharma, S., Garg, A. and Bhattachayya, S. 2004. Inventory Estimation and Emerging Issues. In Mitra, A.P., Sharma, S., Bhattacharya, S., Garg, A., Devotta, S. and Sen, K., (Eds.), *Climate Change and India: Uncertainty Reduction in Greenhouse Gas Inventory Estimates* (pp. 1-14). India: Universities Press (India) Pvt Ltd, Hyderabad.

New Publications from APN Completed Projects

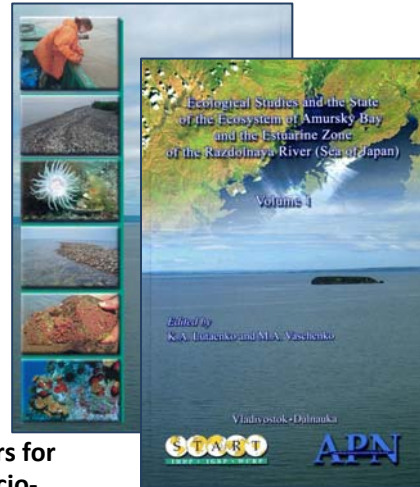
In addition to the publications listed previously, the below also lists papers published prior to, and in 2007/2008 as a result of the funding contributions provided by APN.

APN2005-02CMY-Sonak: Role of Institutions in Global Environmental Change

- Sonak, S., Sonak M. and Giriyan M. 2008. Shipping Hazardous Waste: Implications for Economically Developing Countries, *International Environment Agreements* (8):143–159, DOI 10.1007/s10784-008-9069-3.

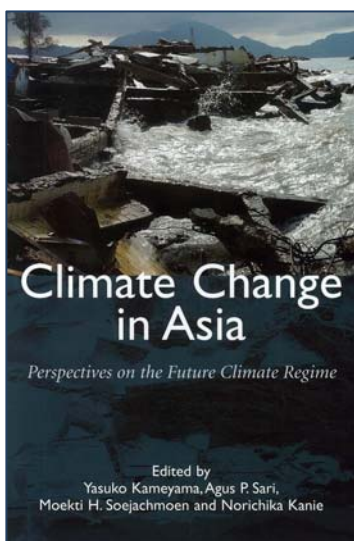
APN2005-05CMY-Kasyanov/Adrianov: Climate Variability and Human Activities in Relation to Northeast Asia and their Land-ocean Interactions and their Implications for Coastal Zone Management

- Lutaenko, K.A. and Vaschenko, M.A. 2008. (Eds.). *Ecological Studies and the State of the Ecosystem of Amursky Bay and the Estuarine Zone of the Razdolnaya River (Sea of Japan)*. Volume 1. Vladivostok, Dalnauka, 301pp.



APN2005-10NSY-Sheik: Development and Application of Climate Extreme Indices and Indicators for Monitoring Trends in Climate Extremes and their Socio-economic Impacts in South Asian Countries

- Sheikh, M. and Hameed, S. 2008. *Trends in Extreme Daily Rainfall and Temperature Indices over South Asia*. First Report. Global Change Impact Studies Centre, 39pp.

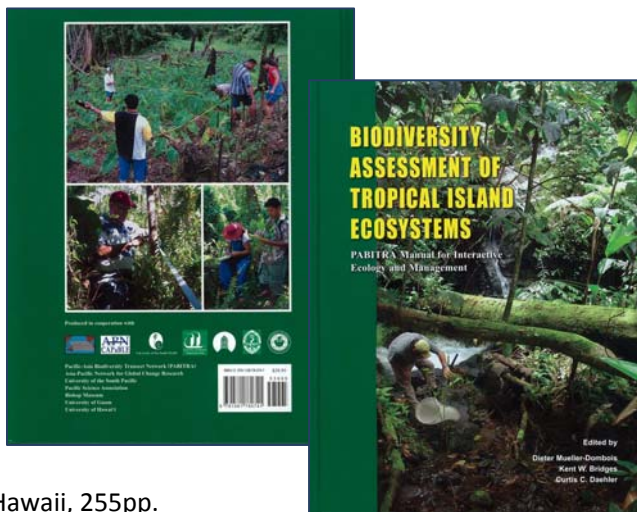


APN2005-25NSY-Sari: Issues Related to Future Actions on Climate Change in Asia and the Pacific

- Kameyama, Y., et.al. (Eds). 2008. *Climate Change in Asia: Perspectives on the Future Climate Change Regime*. United Nations University Press, 274pp.

CBA2006-01NSY-Manner: Capacity Building and Meeting Research Needs on the Ecology of Global Change in Island Landscapes of the Republic of Palau

- Mueller-Dombois, D., Bridges, K. W. and Daehler, C. (Eds.) 2008. *Biodiversity Assessment of Tropical Island Ecosystems: PABITRA Manual for Interactive Ecology and Management*. Bishop Museum Press, Honolulu, Hawaii, 255pp.



CBA2006-06NSY-Towprayoon: Greenhouse Gas (GHG) and Aerosol Emissions under Different Vegetation Land Use in the Mekong River Basin Sub-region

- Garivait, S., Bonnet, S. and Kamnoed, O. 2007. *Air Pollutant Emissions from Paddy Residues Open Burning and Their Potential for Bioenergy in the Mekong River Basin Sub-Region*. Paper presented at the GMSARN International Conference on Sustainable Development: Challenges and Opportunities for GMS, Pattaya, Thailand, 12-14 December 2008
<<http://mpuhost04.ait.ac.th/gmsarn/gmsarn2007/paperlist/050%20-%20Env06%20-%20Garivait%20-%20Air%20pollutant.pdf>>
- Towprayoon, S., et.al. 2007. *Greenhouse Gas and Aerosol Emissions From Rice Field and Forest in the Mekong River Basin Sub-Region*. Paper presented at the GMSARN International Conference on Sustainable Development: Challenges and Opportunities for GMS, Pattaya, Thailand, 12-14 December 2008
<<http://mpuhost04.ait.ac.th/gmsarn/gmsarn2007/paperlist/041%20-%20Env06%20-%20Towprayoon%20-%20Greenhouse%20gas.pdf>>
- Towprayoon, S., et.al. *Greenhouse Gas and Aerosol Emissions From Rice Field and Forest in the Mekong River Basin Sub-Region*. Paper presented at the 13th Regional Deposition Processes on the Atmosphere (RDPA), Tsukuba, Japan, 20-24 January 2008
- Towprayoon, S., et.al. 2007. *Greenhouse Gas and Aerosol Emissions From Rice Field and Forest in the Mekong River Basin Sub-Region*. GMSARN International Journal 2 (2008), 163 - 168

CBA2006-10NSY-Sari: Institutional Dimensions of Global Environmental Change (IDGEC) Synthesis Conference; Institutions for Sustainable Development in the Face of Global Environmental Change: Questioning-Explaining-Demystifying

- Young, O.R., Chambers, W.B., Kim, J.A. and ten Have, C. (Eds.). 2008. Institutional Interplay: *The Case of Biosafety*. United Nations University Press. 200pp.

- Biermann, F. and Siebenhuener, B. *Managers of Global Change: The Influence of International Bureaucracies in Environmental Policy*. Paper presented at the annual meeting of the International Studies Association 48th Annual Convention, Hilton Chicago, CHICAGO, IL, USA, 28 February 2007.

Young Scientists' Section

Workshop on the "The Monsoon System: Prediction of Change and Variability" January 2nd to 12th, 2008, Hawaii, USA



From the organisation to the setting of courses; from the contents of the faculty to the hot discussions among participants; this workshop was successful. The two-week experience during this training will be my invaluable treasure in my life for the Institute provided me a platform to enlarge my knowledge regarding the Asian Monsoon; a chance to meet so many friends and an opportunity to collaborate with friends for future work. For me, this was a most useful and important event. Attending the institute gave me a good chance to access up-to-date knowledge regarding the Monsoon field, which is the basic tool for my future research. The warm discussions and fruitful teaching showed us the known and unknown issues regarding the Asian Monsoon system, which stimulated me to work on some unresolved issues in the future.

Lin Liu, CHINA (Email: liul@fio.org.cn)

State Oceanic Administration, the First Institute of Oceanography

I was very happy to have attended this event and to meet a group of possible research collaborators. I am very much determined to continue to work with them. Getting to know the sources of data and people who can share their data with us is really helpful to me and to my colleagues in my home institution. Also, I was able to gain up-to-date knowledge on the subject of the Asian Monsoon System. It is difficult for my home university to fund research and networking (attending conferences, etc.). This institute helped me identify possible research partners, whom I would not have met otherwise. I am very positive that the young scientists I met in this Institute will help us obtain recent knowledge where we have limited access to research publications such as international journals and books at our home institutions.



Dulakshi Karunasingha, SRI LANKA (Email: dulakshi@yahoo.com)

Faculty of Engineering, University of Peradeniya



This institute provided a stage for me to interact with young scientists around the Asia-Pacific region. The lectures given were relevant and informative and I feel like I now know more about the sciences of the monsoon. Knowing the latest issues and possible challenges ahead has helped to plan for my research milestones for the next few years. I am currently looking forward to working with scientists from the Asia-Pacific Climate Center (APCC) for seasonal prediction and a visit is planned in June, 2008.

Ju Neng Liew, MALAYSIA (Email: juneng@ukm.my)

Faculty of Science and Technology, Universiti Kebangsaan Malaysia

Being a young Meteorologist in Asia, the institute was key to enhancing my understanding about the advances in monsoon science and was one of the most important events for my career development. This opportunity is not only helpful for me but also for the growth of my Department in Kathmandu, Nepal. More importantly, this institute has provided us with a platform to interact with eminent faculties and colleagues and to develop a network for future work.



Archana Shrestha, NEPAL (Email: archanamet@yahoo.com)

Department of Hydrology and Meteorology, Government of Nepal



The institute helped me a lot to refine my research work. It also enhanced my understanding of the Asian Monsoon System and opened many new research topics for me. I developed new collaborations in this institute and will continue working closely with the participants of the institute through the young scientists' network developed in this institute.

Shahbaz Mehmood, PAKISTAN

(Email: shahbaz.mehmood@gcisc.org.pk)

Global Change Impact Studies Centre

Special Report: APN's Contributions to the IPCC AR4

As an inter-governmental network of 21 member countries, the APN is committed to "Strengthening appropriate interactions among scientists and policy-makers, and providing scientific input to policy decision-making and scientific knowledge to the public" (Goal 2). One important role of science is to provide the underpinning information for policy- and decision-making, so it must respond to the needs of policy-makers and decision-makers. It is often a challenge to achieve appropriate linkages and interactions between science and policy processes and, to address this challenge, the APN aims to identify and develop effective methodologies and procedures in the areas under its Science Agenda, and transfer this knowledge and information to the scientific and decision-making communities.

One of the objectives under the APN's Policy Agenda, is to achieve an excellent record of accomplishment of strengthening appropriate science-policy interactions in the areas under its Science Agenda by the end of the period covered by the Second Strategic Plan (2005-2010). One of a number of strategies developed to achieve this is to ensure APN relevance in the work conducted by policy-related bodies such as the IPCC. As such, this section provides selected summaries of APN funded research and capacity building activities that are cited in the IPCC AR4 Report, which was released in December 2007.

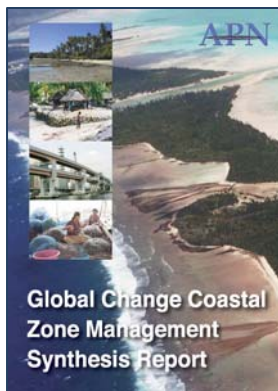
1. [APN2000-09](#). *APN/SURVAZ/LOICZ Joint Conference on Coastal Impacts of Climate Change and Adaptation*: Cited in Chapter 6, Working Group II of IPCC AR4, the APN/SURVAS/LOICZ Joint Conference on Coastal Impacts of Climate Change and Adaptation in the Asia-Pacific Region was held on 14-16 November 2000, at the APN Centre in Kobe, Japan, under the auspices of the APN, the Organising Committee of the Conference, and the Science Council of Japan. The A-P region has been recognised as a focus of the impacts of climate change and sea level rise. However, the linkage between global climate change and societal impacts, and the feasibility of adaptation are poorly understood. It is also questioned how the present environmental problems and development practices are related to future threats. To answer such questions, the conference aimed at bringing relevant researchers and policy-makers in this field to develop a comprehensive understanding on the present knowledge of national and regional vulnerability and possible adaptation strategies.



IPCC Fourth Assessment Report: Climate Change

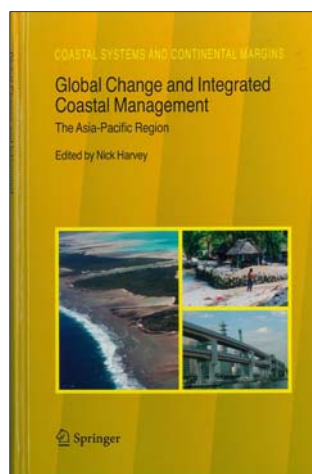
2. [APN2002-02](#). *Continuation of Regional Climate Modelling (RCM) Development*: Cited in Chapter 2, Working Group 1 of IPCC AR4, regional climate modelling groups from throughout the region collaborated to compare their RCM models. This set the scene for comparing regional projections of future climate scenarios using these models, which is expected to provide vital information for policy-makers.
3. [APN2003-01](#). *Asia-Pacific Workshop on Indicators and Indices for Monitoring trends in Climate Extremes*: Cited in Chapter 3, Working Group 1 of IPCC AR4, this was a series of data workshops to which participants from individual countries brought their own data and analysed it for indicators and indices of trends in climate extremes. A series of papers were submitted to journals enabling the IPCC to incorporate these results, which are of relevance to policy developers and hazard managers, into IPCC assessment reports. Participants also brought the results to the attention of their own in-country policy-makers. The work in the region continues to be supported by the APN.
4. [2003-CB070NSY](#). *Capacity Building Workshop on Global Change Research in Pakistan*: With the second workshop proceedings cited in Chapter 10, Working Group II of IPCC AR4, the two workshops conducted under this APN-funded project aimed at enabling mid-career Pakistani scientists to participate effectively in the area of Global Change (GC) Research and the APN process to award annual competitive research grants. The workshops were designed to describe the perspective of GC, the existing international organisations engaged in GC research, the APN network and details of the APN Annual Regional Call for Research Proposals.
5. [ARCP2004-06CMY](#). *The Mega Deltas of Asia – A Conceptual Model and its Application to Future Delta Vulnerability*: Cited in Chapter 10, Working Group II, IPCC AR4, the APN project focused on developing a conceptual model for the geological process and response of Asian Megadeltas, affected by strong monsoons, high river flow and sediment load, and frequent geo-hazard occurrences. Previous databases were integrated from many experienced Asia delta scientists, each working with specific geological issues: 1) subsidence from underground water withdrawal; 2) impact due to sea-level rise; and 3) coastal erosion, saltwater intrusion, and river channel dry-up from damming and water diversion. The database has been further incorporated with new field measures to better understand the geological framework of the delta basin. Thus, the project will allow for substantial improvement of mitigation policies, which most often rely on oversimplified models because of insufficient data and/or lack of solid observations.
6. [ARCP2004-14NMY](#). *Integrated Regional Studies of Global Change in Monsoon Asia: Phase 1 – APN/SCOPE/START Rapid Assessment Project of Global Change in Monsoon Asia*: Cited in Chapter 10, Working Group II, IPCC AR4, this project was aimed at providing a rapid assessment of environmental changes occurring in the monsoon Asia region as a prerequisite for developing a coordinated and integrated effort on regional scale global changes of particular importance to the global earth system. The assessment was envisaged on the basis that irreversible changes to the regional biogeochemistry, and terrestrial and marine ecosystem functioning brought about by increase in population, intensified land use, urbanisation, industrialisation and economic development may have global as well as regional consequences. Similarly, effects of global change may have a significant impact on sustainable development at both regional and national levels.

7. [ARCP2005-20NMY](#). *Assessment of the Effects of High Particulate Pollutants on Pulmonary Health Status in selected Mega-cities of South Asia*: Cited in Chapter 10, Working Group II, IPCC AR4, this ongoing project is investigating 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. Utilising surveys specially designed to analyse and segregate various confounding parameters in the target population and localities in mega-cities of South Asia (Colombo, Delhi, Dhaka, Karachi, Kathmandu, and Calcutta), this project brings together the physical and medical scientists of the region to pool their expertise for the benefit of South Asia.



8. [Synthesis of APN Projects](#). *Global Change Coastal Zone Management: The Asia-Pacific Region*: Cited in Chapter 16, Working Group II, IPCC AR4, this synthesis activity evaluated achievements of APN-funded coastal projects; reviewed coastal issues and research needs for the region; identified future coastal research directions for the region, and reported the results to the APN to assist with future policy directions. The synthesis report demonstrated that, since 1998, the APN provided US\$750,000 funding for 20 coastal research projects in the region. Of these, 11 projects had coastal issues as their main focus and 9 projects dealt with the coast as a crosscutting theme.

9. [APN Springer Publication 2006](#). *Global Change and Integrated Coastal Management: The Asia-Pacific Region*: Cited in various chapters of Working Group II, IPCC AR4, this book is one outcome of the APN synthesis on Global Change Coastal Zone Management and focuses on the potential impacts of global change on coastal environments in the Asia-Pacific region. The book identifies important global change issues, which will be relevant for the future management of coastal environments in the Asia-Pacific region. The most important of these is global warming and accelerated sea-level rise. The potential impacts from this are compounded by current issues such as unsustainable use of coastal resources; coastal impacts from poor catchment management; population increase and urbanisation pressure; coastal resource and development pressure on rural coasts. The book addresses methods for tackling these issues such as 'integrated coastal management' and the need to recognise the diversity of coastal management.



10. [2005-CRPO2CMY](#). *Integrated Assessment Model for Developing Countries and Analysis of Mitigation Options and Sustainable Development Opportunities*: Cited in Chapters 3 and 11 of Working Group III, IPCC AR4. This CAPaBLE Phase I comprehensive research project focused on integrated assessment models for developing countries and the analysis of mitigation options and sustainable development. A summary of the activities conducted under this project is available in the present annual report on pages 41-44.

COMMUNICATIONS AND OUTREACH

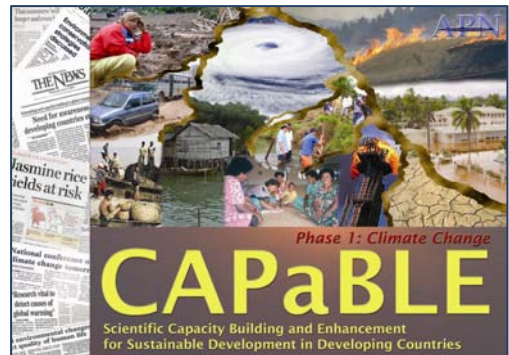
In 2007/2008, the APN used the following communication tools to demonstrate its work in the region, communicate the outcomes of the projects it supports, and disseminate the results and outputs of its activities to the public.

Publications

The following publications were produced/published to provide scientific information to policy-makers and the public, to further promote the network in the region, and to encourage involvement in APN activities.

CAPaBLE Phase I Brochure

This brochure highlights activities completed in Phase One of the Scientific Capacity Building/Enhancement for Sustainable Development in Developing Countries (CAPaBLE Programme), which ran from April 2003 to March 2006, including seventeen capacity-building and comprehensive research projects conducted throughout the Asia-Pacific region. This was distributed at the United Nations Framework Convention on Climate Change (UNFCCC) 13th Conference of Parties and 3rd Meeting of the Parties (COP13/MOP3), held in Bali, Indonesia, on December 2007.



APN General Brochure 2007 (12 languages)

This brochure contains a brief introduction about APN with information on its vision, goals, scientific agenda, programmes, members and structure. It came out in 13 languages: Bahasa Indonesia, Bahasa Malaysia, Bengali (Bangladesh), Chinese, English, Filipino/Tagalog, Japanese, Khmer (Cambodia), Lao, Russian, Sinhala (Sri Lanka), and Thai. Some of these versions are both available in hard and electronic copies. The APN members painstakingly translated the brochure in their native languages, voluntarily shared in the printing expenses and disseminated the brochures to scientists and policy-makers

in various organisations and government institutions. These brochures are making considerable difference in the visibility of the APN at the national and sub-regional level.

Annual Report 2006/2007 (in English and Japanese)

The Annual Report 2006/2007 (produced in both English and Japanese) presents a summary of APN’s efforts at promoting global change research, particularly highlighting the results and outputs of its completed projects conducted under the Annual Regional Call for Research Proposals (ARCP) and CAPaBLE, publications produced by APN, and other major activities.



Project Bulletin, Volume 3

The Project Bulletin, Volume 3 contains the abstracts of research and capacity building projects funded by APN under the ARCP and the CAPaBLE Programme (21 projects under the ARCP and 14 under CAPaBLE). Contact information of the project leaders is also included for those interested in learning more about the funded projects.



APN Newsletter

The APN publishes a quarterly newsletter which features news from the Secretariat, APN’s representation at national and international events, ARCP-funded projects, CAPaBLE Programme updates, list of ongoing projects, people in the APN (members and committees), newsletter questionnaire, crossword challenge and a calendar of events, which highlights particular events supported by the APN. In order to reduce the environmental and economical burden, it was decided to produce the newsletter in electronic format only. All issues of the APN newsletter are available for download in PDF format in the “products” section on the APN website.



Inclusion in “The First 100 Steps to GEOSS”

The outcomes of the APN Scoping Workshops on Global Earth Observations and Capacity Building Needs of the Region: Focus –Climate was published in the Group on Earth Observations (GEO) publication “The First 100 Steps to Global Earth Observation System of Systems (GEOSS)” as Annex of Early Achievements to the Report on Progress 2007 of the Cape Town

Ministerial Summit: Earth Observations for Sustainable Growth and Development on 30 November 2007.

Website

This is an important communication tool of the APN which, from the time it was established, has become a source of useful information about the APN, how it is structured, who are the key players as well as details on the projects that APN supported and is currently funding; publications that were produced; global change events; and other activities that were conducted in the past. The website is maintained daily, providing up-to-the-minute information on the APN and its activities. To further disseminate information to the public and to make the project outputs accessible to the global change community, a more comprehensive 'APN Project Outputs' webpage is being developed for the projects under ARCP. A webpage on CAPaBLE project outputs and resources used was published in August 2008.



<http://www.apn-gcr.org/>



Electronic Mailing List

APN maintains an electronic mailing list (EML) and uses this tool to strategically disseminate information as well as support the network. Aside from the quarterly Newsletter, periodic announcements and notifications that are related to global/climate change or to APN activities are also sent via our EML. These include: upcoming GC events, call for papers, release of new publications such as technical papers, policy briefs, etc. APN also welcomes requests from partner organisations to post announcements on the website and distribute the information via the APN EML. The Secretariat also subscribes to other mailing list groups of various organisations to be able to receive information and further disseminate it to its Members and the global change community.

Representation at National and International Events

The APN attended and made presentations at various international fora to further raise its visibility/recognition in the region. Committed to strengthening appropriate interactions among scientists and policy-makers, and providing scientific input to policy decision-making and scientific knowledge to the public, the APN is also continuously cooperating with the global change programmes and other institutions and bodies such as the Secretariat of the United Nations Framework Convention on Climate Change (UNFCCC) particularly on holding events in connection with the Subsidiary Body for Scientific and technological Advice (SBSTA).

1. **UNFCCC 26th Session of SBSTA. Bonn, Germany. May 2007**
2. Institute for Global Environmental Strategies (IGES) In-House Seminar. Kanagawa, Japan. June 2007
3. Inter-American Institute for Global Change Research (IAI) 14th Conference of the Parties. Manaus, Brazil. June 2007



APN participated at the 15th ECO Asia, Fukuoka, Japan, September 2007

4. 15th Environment Congress for Asia and the Pacific (ECO Asia 2007). Fukuoka, Japan. September 2007
5. Global Change SysTEM for Analysis, Research, and Training (START) Scientific Steering Committee Meeting. Ottawa, Ontario, Canada. September 2007
6. Asia-Pacific Regional Workshop on GEOS Information Access. Beijing, China. October 2007

7. International Group of Funding Agencies for Global Change Research (IGFA) Meeting. Vienna, Austria. October 2007
8. UNFCCC 13th Conference of the Parties and 3rd Meeting of the Parties (COP13/MOP3). Bali, Indonesia. December 2007

- APN Project “Capacity Building in Asian Countries on Climate Change Issues Related to Future Regime” Unofficial Side Event
- UNU (IHD) Official Side Event on Vulnerability, Adaptation, Resilience: Cutting-Edge Science for Informed Decisions
- APN Project “Assessing the Mitigation and Adaptation Options for Tropical Peatlands to Reduce GHG Emissions and Increase Resilience to Climate Change” Official Side Event and Exhibit
- Overseas Environmental Cooperation Center (OECC) Unofficial Side Event on Climate Change and Development: Creating an Enabling Environment for Development Planning: Perspectives from the Asia-Pacific

9. 3rd Asian Water Cycle Symposium. Oita International House of the Japan Student Services Organisation, Beppu, Japan. December



APN presented APN GEOS-related activities at the Asia-Pacific Regional Workshop on GEOS Information Access, Beijing, China, October 2007

At the UNFCCC COP13/MOP3 in Bali, Indonesia, December 2007



Former Secretariat Director, Mr. Hashizume and Project Leader, Mr. Faizal in a side event



APN publications showcased in various exhibition booths



Scientific Officer, Dr. Stevenson presented on climate-adaptation activities by APN

PEOPLE IN THE APN

The APN is made up of dedicated experts who play an active role in promoting the APN programme and its activities in their countries, sub-region and the global change community.

The lists below are current, at the time of publication, December 2008.

APN national Focal Points (nFP) and Scientific Planning Group (SPG) Members

Each member country appoints one nFP who sets policy for programmes, finances and other APN activities, and one SPG Member, who recommends science themes and activities for the Inter-Governmental Meeting (IGM) to consider for support.

Australia

Michael STODDART (nFP), Australian Antarctic Division

David WALLAND (SPG), Bureau of Meteorology

Bangladesh

Md. Nazrul Islam KHAN (nFP), Ministry of Environment and Forest

Giashuddin MIAH (SPG), Bangabandhu Sheikh Mujibur Rahman Agricultural University

Cambodia

Sundara SEM (nFP), Ministry of Environment

Khieu HOURT (SPG), Ministry of Agriculture, Forestry and Fisheries

China

Xuedu LU (nFP), Ministry of Science and Technology

Wenjie DONG (SPG), Beijing Normal University

Fiji

Epeli NASOME (nFP), Ministry of Land, Mineral Resources and Environment

Rajendra PRASAD (SPG), Fiji Meteorological Service

India

Subodh SHARMA (nFP), Ministry of Environment and Forests

B.N. GOSWAMI (SPG), Indian Institute of Tropical Meteorology

Indonesia

Liana BRATASIDA (nFP), Ministry of Environment

Erna Sri ADININGSIH (SPG), National Institute of Aeronautics and Space (LAPAN)

Japan

Hiroshi ONO (nFP), Ministry of the Environment

Nobuo MIMURA (SPG), Ibaraki University

Lao People's Democratic Republic

Bauntanh BOUNVILAY (nFP), Water Resources and Environment Administration

Ongkeo OULAPHONE (SPG), Water Resources and Environment Research Institute

Malaysia

Yap Kok SENG (nFP), Malaysian Meteorological Service

Subramaniam MOTEN (SPG), Malaysian Meteorological Department

Mongolia

Bayarbat DASHZEVEG (nFP), Ministry of Nature and Environment of Mongolia
Tsogtbaatar JAMSRAN (SPG), Mongolian Academy of Sciences

Nepal

Meena KHANAL (nFP), Ministry of Environment, Science and Technology
Madan Lall SHRESTHA (SPG), Nepal Academy of Science and Technology

New Zealand

W. Andrew MATTHEWS (nFP/SPG), New Zealand National Commission for UNESCO

Pakistan

Muhammad Tanvir BUTT (nFP), Ministry of Environment
Amir MUHAMMED (SPG), National University of Computer and Emerging Sciences

Philippines

Samuel PEÑAFIEL (nFP), Department of Environment and Natural Resources
Leuvina TANDUG (SPG), Ecosystems Research and Development Bureau

Republic of Korea

Jung Kyun NA (nFP), Ministry of Environment
Chang-keun SONG (SPG), National Institute of Environmental Research

Russian Federation

Alexander STERIN (SPG), *Russian Research Institute for Hydrometeorological Information - World Data Center*

Sri Lanka

M.A.R.D. JAYATILAKE (nFP), Ministry of Environment
G.H.P. DHARMARATNA (SPG), Department of Meteorology

Thailand

Saksit TRIDECH (nFP), Ministry of Natural Resources and Environment
Jariya BOONJAWAT (SPG), Chulalongkorn University

United States of America

Louis BROWN (nFP), U.S. Climate Change Science Program; National Science Foundation
Luis M. TUPAS (SPG), US Department of Agriculture

Viet Nam

Xuan Bao Tam NGUYEN (nFP), Ministry of Natural Resources and Environment
Nga MAI NGOC (SPG), Center for Support of Social Development Programmes

Invited Experts to the SPG

International organisations and research institutions, involved in global change research activities, may attend the SPG Meeting as observers and to participate in SPG activities.

Congbin FU, START Regional Committee for Temperate East Asia
Kanayathu KOSHY, START Oceania Regional Committee (former Director)
Chao Han LIU, Southeast Asia START Regional Committee

Members of the Steering Committee (SC)

The SC acts on behalf of the IGM during the period between IGMs, implementing IGM decisions, with assistance from the Secretariat.

National Focal Points

Liana BRATASIDA, Indonesia

Hiroshi ONO, Japan

Samuel PEÑAFIEL, Philippines (Chair)

Yap Kok SENG, Malaysia

SPG Co-Chairs

G.H.P. DHARMARATNA, SPG Member for Sri Lanka

W. Andrew MATTHEWS, nFP/SPG Member for New Zealand

Opt-in Members

Louis BROWN, nFP for USA

Roland FUCHS, Senior Fellow, East-West Center (former START International Secretariat Director)

Jung-kyun NA, nFP for the Republic of Korea

Michael STODDART, nFP for Australia

Saksit TRIDECH, nFP for Thailand

Members of the Capacity Development Committee (CDC)

The CDC oversees the processes related to the operation of the CAPaBLE Programme and the development of strategies for its advancement.

Ex-officio Members of the SC

G.H.P. DHARMARATNA, SPG Co-Chair

W. Andrew MATTHEWS, SPG Co-Chair

Samuel PEÑAFIEL, SC Chair

Donor Representative

Hiroshi ONO, nFP for Japan

Invited Experts

Ahsan Uddin AHMED, Center for Global Change

Roland FUCHS, East-West Center

David WALLAND, SPG Member for Australia

Members of the SPG Sub-Committee

The SPG Sub-Committee oversees the implementation and development of the APN scientific activities, particularly the Annual Regional Call for Research Proposals.

G.H.P. DHARMARATNA, Sri Lanka

Andrew MATTHEWS, New Zealand

Subramaniam MOTEN, Malaysia

Luis TUPAS, USA

Secretariat

The Secretariat performs the daily operations of the APN and, in particular, assists the IGM, the SC, the CDC and the SPG in implementing the APN's Strategic Plan and Operational Plans; programme; budget; and other activities, as appropriate. Its Office is located in Kobe, Japan, under the support of the Hyogo Prefectural Government.

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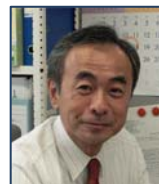


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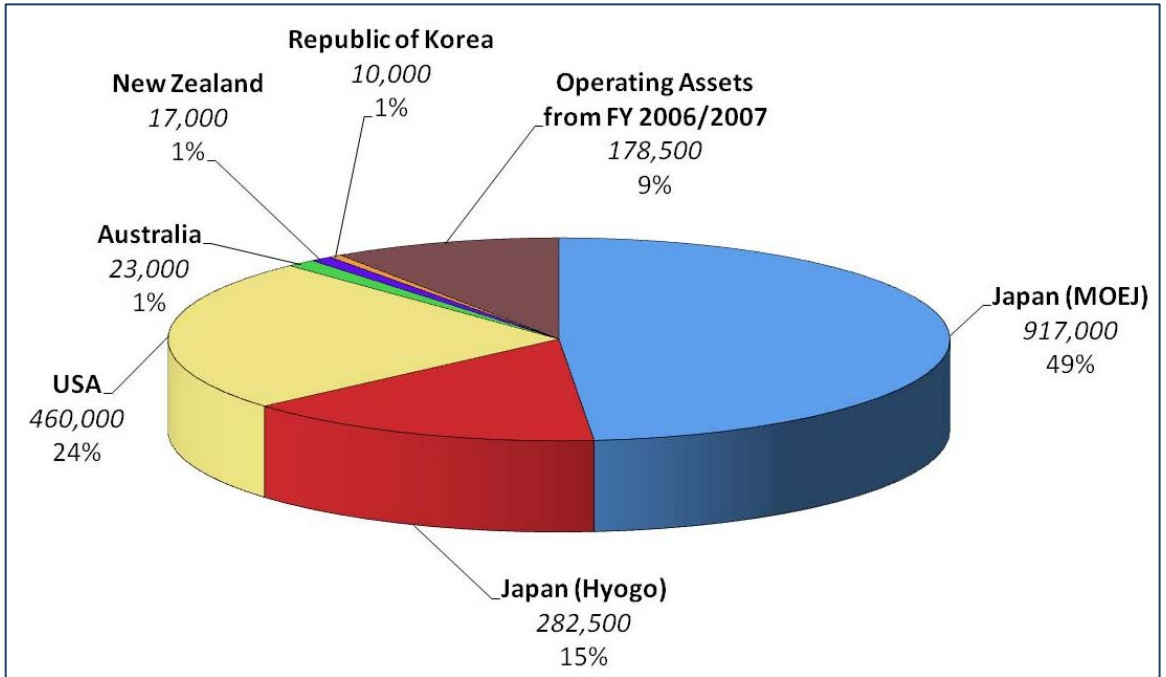


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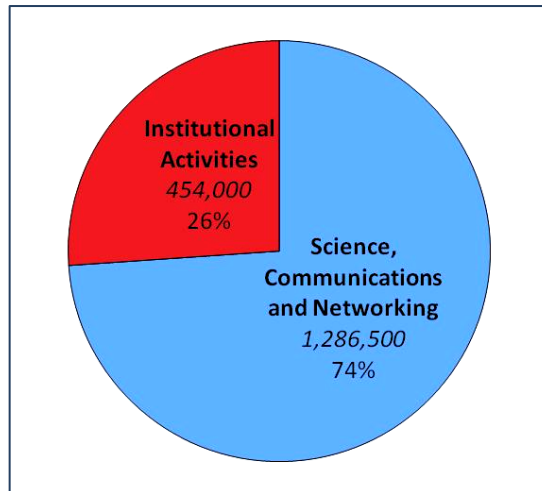


FINANCIAL RESOURCES

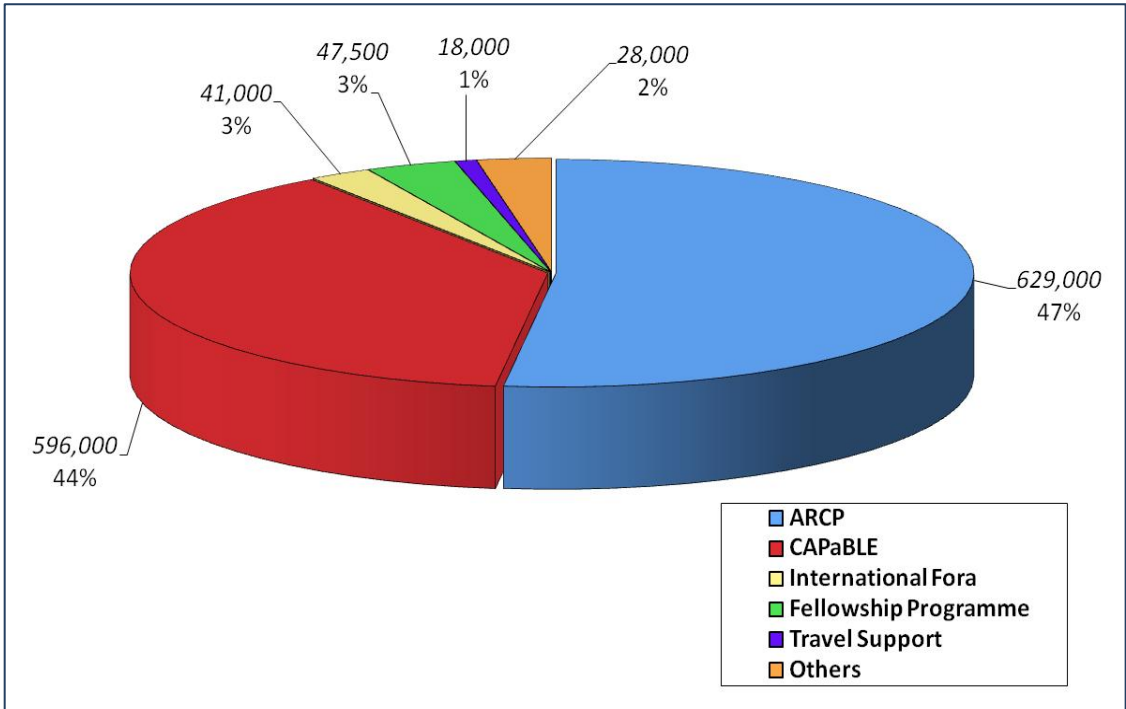
Revenue in FY 2007/2008 (US\$)



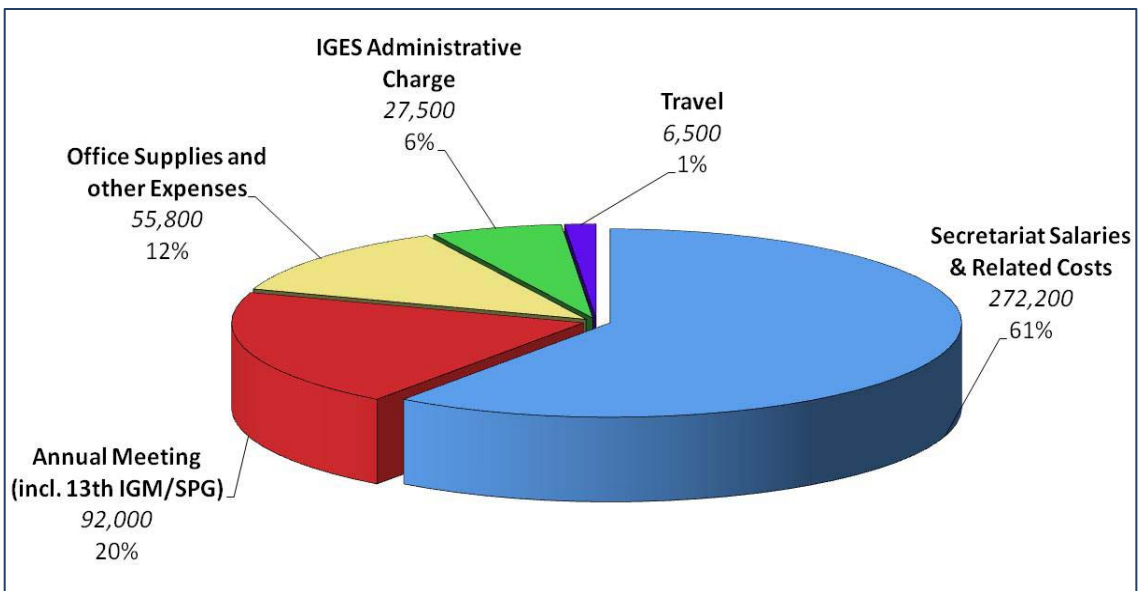
Expenditure in FY 2007/2008 (US\$)



**Breakdown of Expenditure for Science,
Communications & Networking (US\$)**



Breakdown of Institutional Expenditures



MEMBER COUNTRIES AND SPONSORS

The APN relies heavily on the generosity and commitment of all its member countries for financial and in-kind support.

APN Membership

The APN's membership has grown from 12 countries in 1996 to the current 21 member countries: Australia, Bangladesh, 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.

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 membership participation criterion.

APN Sponsors

The following sponsors provide direct funding for the APN that is complimented by in-kind support from APN members, such as hosting workshops and seminars and the sharing of scientific and management expertise.



Australian Government

Department of the Environment, Water, Heritage and the Arts



Hyogo Prefectural
Government, Japan



Ministry of the
Environment, Japan



Ministry for the
Environment
Manatū Mo Te Taiao

New Zealand



Ministry of Environment
Republic of Korea



National Science Foundation
United States of America



United States of America

PARTNER ORGANISATIONS

A key goal of the APN is to strengthen cooperative relations amongst the global change research community.

The APN believes in the value of partnerships and networks and considers working with other organisations involved in global change research, capacity building and policy development a crucial effort in fostering global change research in the region.

Together with the organisations and institutions that are directly co-implementing APN projects and activities, the following are among APN's key partners:

- AfricaNESS – African Network for Earth System Science
The mission of AfricaNESS is to promote global change research and capacity enhancement for sustainable development in Africa.
- ESSP – Earth System Science Partnership
It is a joint initiative of four global environmental change programmes: DIVERSITAS, IGBP, IHDP, and WCRP bringing together researchers from diverse fields and from across the globe, to undertake an integrated study of the Earth System, the way that it is changing, and the implications for global and regional sustainability.
- DIVERSITAS – International Programme of Biodiversity Science
The mission of DIVERSITAS is to promote an integrative biodiversity science, linking biological, ecological and social disciplines in an effort to produce socially relevant new knowledge; and provide the scientific basis for the conservation and sustainable use of biodiversity.
- IAI – Inter-American Institute for Global Change Research
It is an intergovernmental organisation dedicated to the principles of scientific excellence, international cooperation, and the full and open exchange of scientific information to increase the understanding of global change phenomena and their socio-economic implications in the Americas.
- IGBP – International Geosphere-Biosphere Programme
It is a research programme that studies the interactions between biological, chemical and physical processes and interactions with human systems and collaborates with other programmes to develop and impart the understanding necessary to respond to global change and also to provide scientific knowledge to improve the sustainability of the living Earth.
- IHDP – International Human Dimensions Programme on Global Environmental Change
It is an international, interdisciplinary, non-governmental science programme dedicated to promoting and coordinating research, capacity-development and networking on human dimensions of global environmental change.
- WCRP – World Climate Research Programme
The two overarching objectives of WCRP are to determine the predictability of climate and to determine the effect of human activities on climate.
- START – Global Change SysTEM for Analysis, Research and Training
It is a non-governmental, non-profit organisation that seeks to establish and foster regional networks of collaborating scientists and institutions in developing countries to conduct research on regional aspects of environmental change, assess impacts and vulnerabilities to such changes and provide information to policy-makers.

Recognising that it cannot achieve its goal on its own, APN is constantly exploring opportunities to find new synergies for funding, research, and network-building, etc.

NEXT STEPS



For 2008/2009 and particularly in the next four months, the APN will be very busy preparing for the scientific and institutional review of its second strategic phase hand-in-hand with the formulation of its third strategic plan. This is a priority activity next to the management of projects under the two main pillars of APN's activities: the ARCP and the CAPaBLE Programmes.

In its forward-looking approach, the APN continues to exert its efforts on achieving its mission and goals in the most efficient and effective way guided by the Second Strategic Plan 2005-2010 and its Annual Operating Plan to be of better service to the global change (GC) community, particularly in the Asia-Pacific region. The APN is counting on the active participation of its 21 member countries and cooperation of partner organisations and agencies to be able to play a more significant role in supporting GC research based on its three main agendas: Science, Policy and Institutional.

Under the Science Agenda, the APN will update the scientific themes according to the changing research and priorities of the network, its members and the GC and policy-making communities. It will continue to facilitate and support collaborative research projects in the region and make use of the SPG expertise and the pool of external expert reviewers to provide sound and fair judgement on which proposals submitted to APN will be considered for funding. The Secretariat, with support and guidance from the SPG Sub-Committee will investigate how the Proposal Submission and Review Process can be further streamlined.

The Capacity Development Committee will continue to oversee the implementation of activities under the CAPaBLE Programme and also aim for further improvement in the APN's capacity development endeavours. Capacity building and capacity enhancement efforts in science and education at all levels from the local community levels, to the national, regional and global levels, particularly in developing countries, will be continued.

The APN is dedicated to further promoting science-policy linkages under its Policy Agenda. While this is a challenge that also faces many organisations in the world, the APN is determined to identify and develop new and effective mechanisms to help transfer beneficial information and knowledge to decision-makers and scientific communities. More publications, such as policy briefs and project syntheses are in the pipeline for 2008/2009.

The APN's Institutional Agenda covers a wider area including: 1) active involvement of member countries; 2) financial resources; and 3) alignment with the GC community. While significant improvements were realised in the past years, there remain challenges that APN is ready to address. The development of the APN 'Communications Strategy' is a work in progress, together with the empowerment of its members so they can actively participate in various APN activities, particularly in their respective sub-regions. In this time where countries in the world are experiencing global economic crisis, APN will endeavour to design and implement a 'Resources Development Plan' to maximise its support from members and partners. To make the most of available resources and deliver the best possible results, the APN will continue working in partnership with other organisations involved in policy development and GC research.

ACRONYMS

AEEMF	Asian Energy and Environment Modelling Forum
AfricaNESS	African Network for Earth System Science
AIACC	Assessments of Impacts and Adaptations to Climate Change
AIT	Asian Institute of Technology
APCC	Asia-Pacific Climate Center
APEC	Asia-Pacific Economic Cooperation
APEIS	Asia-Pacific Environment Innovation Strategy
APN	Asia-Pacific Network for Global Change Research
AR4	Fourth Assessment Report
ARCP	Annual Regional Call for Research Proposals
AWCI	Asian Water Cycle Initiative
BUP	Bangladesh Unnayan Parishad
CAPaBLE	Scientific Capacity Building and Enhancement for Sustainable Development in Developing Countries
CBD	Convention on Biological Diversity
CC	Climate Change
CCD	Convention to Combat Desertification
CDC	Capacity Development Committee
CDM	Clean Development Mechanism
CITES	Computational Information Technologies for Environmental Sciences
CLIVAR	Climate Variability and Predictability
COP	Conference of the Parties
CRP	Comprehensive Research Project
CSM	Crop Simulation Modelling
DANIDA	Danish International Development Agency
DHM	Department of Hydrology and Meteorology
DIAS	Data Integration and Analysis System
DIVERSITAS	International Programme of Biodiversity Science
DIWPA	DIVERSITAS in Western Pacific and Asia
DSDS	Delhi Sustainable Development
ECO Asia	Environmental Congress for Asia and the Pacific
ERI	Energy Research Institute
ESSP	Earth System Science Partnership
FFPRI	Forestry and Forest Products Research Institute
GC	Global Change
GCISC	Global Change Impact Studies Centre
GCM	Global Climate Model
GCISC	Global Change Impact Studies Centre
GEO	Group on Earth Observations
GEOSS	Global Earth Observation System of Systems
GEWEX	Global Energy and Water Cycle Experiment
GHG	greenhouse gas
GPS	Global Positioning System
HIWP	Hansen Institute for World Peace
IAI	Inter-American Institute for Global Change Research
IAM	Integrated Assessment Model
IAMSLIC	International Association of Marine Science Libraries and Information Centers
ICIMOD	International Centre for Integrated Mountain Development
ICT	Information and Communication Technology
IDGEC	Institutional Dimensions of Global Environmental Change

IGBP	International Geosphere-Biosphere Programme
IGES	Institute for Global Environment Strategies
IGFA	International Group of Funding Agencies for Global Change Research
IGM	Inter-Governmental Meeting
IHDP	International Human Dimensions Programme on Global Environmental Change
IIMA	Indian Institute of Management
IIWaDATA	International Integrated Water Data Access and Transfer in Asia
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for Conservation of Nature (The World Conservation Union)
KMA	Korea Meteorological Administration
KORDI	Korean Ocean Research Development and Institute
LAPAN	National Institute of Aeronautics and Space
LDC	Least Developed Country
LOICZ	Land-Ocean Interactions in Coastal Zone
MOEJ	Ministry of the Environment, Japan
MOP	Meeting of the Parties
MSWM	Municipal Solid Waste Management
NDRI	Nepal Development Research Institute
nFP	national Focal Point
NGO	Non-Governmental Organisation
OECC	Overseas Environmental Cooperation Center
PMD	Pakistan Meteorological Department
PABITRA	Pacific-Asia-Biodiversity Transect Network
PICs	Pacific Island Countries
PNRC	Palau Natural Resources Council
POPs	Persistent Organic Pollutants
PPPUe	Public-Private Partnerships for Urban Environment
PRECIS	Providing Regional Climate for Impacts Studies
RCM	Regional Climate Modelling
RDPA	Regional Deposition Processes on the Atmosphere
SARAP	South Asia Rapid Assessment Project
SBSTA	Subsidiary Body for Scientific and Technological Advice
SC	Steering Committee
SCOPE	Scientific Committee on Problems of the Environment
SEASRCom	Southeast Asia Sub-Regional Committee
SPG	Scientific Planning Group
START	global change SysTem for Analysis, Research and Training
SURVAS	Synthesis and Upscaling of sea-level Rise Vulnerability Assessment Studies
SWMRMC	Solid Waste Management and Resource Mobilization Center
TERI	The Energy Resources Institute
UNCSD	United Nations Commission on Sustainable Development
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNITAR	United Nations Institute for Training and Research
UNU	United Nations University
USEFAM	University Support to Environmental Planning and Management
USP	University of the South Pacific
WCRP	World Climate Research Programme
WSM	Watershed Simulation Modelling

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

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