

Climate Change
& Variability

Atmospheric Composition

Terrestrial Ecosystems & Biodiversity

Coastal Zones & Inland Waters

APN
Asia-Pacific Network for Global Change Research

ASIA-PACIFIC NETWORK FOR GLOBAL CHANGE RESEARCH

**Project and Regional Reports
2004/2005**

March 2005

Preface

The Asia-Pacific Network for Global Change Research (APN) is an inter-governmental network whose mission is to foster global change research in the Asia-Pacific region, increase developing country participation in that research, and strengthen interactions between the science community and policy-makers. The APN believes that international cooperation among governments and scientists will help increase the understanding of the complex mechanisms and impacts of global change on ecosystems and human society in the Asia-Pacific region. This is necessary to identify and address the problems that may arise from that change.

This publication comprises two chapters:

- Chapter One - APN Project Reports; and
- Chapter Two - APN Liaison Officer Regional Reports

Funds for these APN activities primarily came from the Ministry of the Environment, Japan, Hyogo Prefectural Government, Japan, and the National Science Foundation on behalf of the US Climate Change Science Program (NSF/USCCSP). In addition, the APN is appreciative for the in-kind support that comes from various countries and/or institutions for APN activities.

Chapter One features the reports of eighteen projects the APN supported in 2004/2005 as a result of the competitive Annual Regional Call for Proposals process. The projects supported cover a variety of important issues relating to global change research, with special emphasis on the Asia-Pacific region.

Chapter Two focuses on regional reports of the APN liaison officers in Oceania, South Asia, Southeast Asia and Temperate East Asia.

From reading this publication you will also see that APN activities collaborate closely with key global change organisations, such as the International Programme of Biodiversity Science (DIVERSITAS), the International Geosphere-Biosphere Programme (IGBP), the International Human Dimensions Programme on Global Environmental Change (IHDP), the SysTEM for Analysis Research and Training (START) and the World Climate Research Programme (WCRP).

The APN supports and encourages the dissemination of the information contained in this publication and specifically notes that the potential results of the present research can contribute to policy development relating to global change in the Asia-Pacific region.

This publication is also available on the APN website (www.apn.gr.jp).

Secretariat

Asia-Pacific Network for Global Change Research (APN)

**Asia-Pacific Network for Global Change Research (APN)
Project and Regional Reports
2004/2005**

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APN Project Reports

**Climate Prediction and Agriculture: An Assessment and
Perspective (APN 2004-17-NSY)**

Project Leader:

Prof. S. GADGIL

Indian Inst. Of Science

Bangalore, 560012

INDIA

Tel: +91-80-3092-505

Fax: +91-80-3600-865

Email: sulo@cas.iisc.ernet.in

Climate Prediction and Agriculture: An Assessment and Perspective (APN 2004-17-NSY)

APN funding:

US\$ 15,000

Participating countries:

Participants from the following countries were funded by this APN grant: China, India, Indonesia, and Viet Nam. Participants from the following countries were funded by alternative means: Australia, Chile, Germany, Ghana, India, Indonesia, Italy, Peru, South Africa, Switzerland, Thailand, Uganda, the UK and the USA.

Abstract:

The workshop, to be hosted by the WMO, Geneva, will bring together scientists and representatives of the broader community, now involved in CLIMAG-related activities, to review advances in the science since the 1999 International Workshop that launched CLIMAG, share experiences in application of seasonal forecasts, discuss outstanding issues and challenges, and develop a strategy for future activities under CLIMAG.

Activities conducted:

The workshop is planned for 11-13 May 2005 at the WMO HQ in Geneva, Switzerland. Logistical preparatory activities have been in progress for sometime now; the agenda, brochure, participants list, and invitations have been finalised.

Outcomes:

Expected outcomes include an authoritative review and assessment of the application of seasonal to inter-annual climate forecasts to agriculture production, particularly by small farmers in developing countries. The review will contain:

- Advances in seasonal climate forecasts;
- Predictions of agricultural impacts of climate fluctuation;
- Advances in communicating climate information to agricultural decision-makers; and
- Use of forecasts in decision support systems. The workshop will also identify significant gaps in knowledge, methodologies, implementation, and research and capacity building priorities and institutional needs. Furthermore, consideration of the potential applications of climate science to other sectors, such as water resources management, will be considered.

Product outputs:

We expect the following products will result from this activity:

- Workshop report, including abstracts of papers;
- A special issue of the journal "Climate Change" will include keynote and invited papers, and selected regional case studies; and
- Recommendations for follow-up research and capacity building activities.

Self evaluation:

Coordinating efforts are progressing well. The workshop was initially planned for late 2004; however, due to scheduling difficulties with WMO HQ and delayed confirmation from numerous keynote participants, it had to be postponed. The workshop is now confirmed for 11-14 May 2005.

Future directions and follow-up work:

The workshop report, containing abstracts of all the papers presented, summaries of discussions in plenary and breakout sessions, and key recommendations, will be published and distributed within 90 days of the culmination of the conference. A copy will be provided to the APN Secretariat. A special issue of the journal, "Climate Change", containing keynote and invited papers on key issues, will be published and distributed approximately one year after the conference.

**Applying Climate Information to Enhance the Resilience of
Farming Systems Exposed to Climatic Risk in South and
Southeast Asia (APN 2004-01-CMY)**

Project Leader:

Dr. H. MEINKE

Queensland Department of Primary Industries & Fisheries
Agricultural Production Systems Research Unit

P.O. Box 102, Toowoomba

QLD 4350

AUSTRALIA

Tel: +61-7-4688-1378

Fax: +61-7-4688-1193

Email: holger.meinke@dpi.qld.gov.au

Applying Climate Information to Enhance the Resilience of Farming Systems Exposed to Climatic Risk in South and Southeast Asia (APN 2004-01-CMY)

APN funding:

Year 1: (APN 2002-09) US\$ 85,000

Year 2: (APN 2003-02) US\$ 85,000

Year 3: (APN 2004-01-CMY) US\$ 85,000

Participating countries:



Participants from the following countries were funded: Australia, India, Indonesia, Pakistan, and the USA.

Abstract:

This is the final year of a three-year project, utilising the research network established by previous APN-funded projects: APN 2002-09 and APN 2003-02. It aims to deliver benefits from climate forecast information to agricultural decision-makers and plot a course for large-scale, sustained operational support of seasonal climate prediction within the target countries.

Activities conducted:

While attending the 4th International Crop Science Congress (4th ICSC) in September 2004, a short meeting was held to update team members on work conducted so far, and to confirm plans for the remainder of the project. A final project meeting is scheduled for August 2005, in Southern India. This meeting will synthesise and document project outputs including: capacity building; stakeholder interactions; farmer workshop protocols; methodology development; climate analyses; cropping system simulation and analyses; ex-ante analyses of decision responses; ex-post evidence of impacts of forecast use; and extensions beyond the project.

- Evaluation of transformed GCM hindcast skills at multiple scales has progressed with Dr. Hansen distributing and training users in the IRI Climate Prediction Tool (CPT). This tool supports the statistical analysis of district-scale crop data, rainfall and GCM indicators. In addition, the IITM nested Regional Spectral Model is being evaluated;
- An investigation into the predictability of spell statistics will be an activity reported at the final meeting;
- A poster on the global influence of the MJO  India and Indonesia was presented at the 4th ICSC, and a paper for the Journal of Climate is in the final draft stage;
- A study on financial tools for risk management continues, and will be presented at the final project meeting;
- Crop model runs from GCM hindcasts at 2 locations in Southern India are being performed at TNAU  imbatore;
- A TNAU field experiment evaluating groundnut varieties, has extended model-based analysis and provided insight on criteria for variety selection under climate risk;

- The risk management tool for extension (RiskPro) software package is currently being developed; its launch is scheduled for March, 2005;
- Model validation and analysis of cropping systems continues at IISC, Bangalore; aiming for publication in an international journal;
- A simple GCM statistical down-scaling model has been tested to extend the monthly rainfall series at a number of stations in Bandung districts. The down-scaled GCM data has been used to run the APSIM model;
- Modelling of simulation scenarios for Indonesia continues at BAU, Bogor. A database of simulation results was developed using APSIM Outlook. This allows users to easily evaluate the impact of changing crop managements on crop performance under different SOI phases;
- Perdinan and A. Faqih, from Indonesia, visited Toowoomba in October 2004 to present posters at the 4th ICSC and participate in the 2nd APN/CAPaBLE Climate Networks workshop. They subsequently spent a further three weeks to update their APSIM simulation skills, run model scenarios for Indonesia and explore a number of down-scaling techniques; and
- Simulation analysis of double-cropping scenarios in Pakistan is for the most part complete; a poster was presented at the 4th ICSC. On-farm demonstrations of double cropping opportunities continue in high, medium and low rainfall zones in the Islamabad area. Efforts are being made to boost the production of pulses in Pakistan, as their suitability in various cropping systems has been shown to benefit the resources of poor farmers, particularly in rainfed agriculture. A paper will be published soon after the harvest of wheat crops in April/May 2005.

Outcomes:

The project extension has allowed for a broader time frame and greater scope for our work. As such, many outcomes are still in progress. As a result of continued funding, Selvaraju was awarded the START Young Scientist award, in 2004. A growing realisation of the need for integrated systems modelling for agricultural research has resulted in a major initiative by the Pakistani Government. A meeting in early March aims to set up a major national research group closely modelled on APSRU. This collaborative initiative between several government ministries is a direct consequence of project activities.

Product outputs:

In addition to the outputs above, which are in various stages of production the following outputs have resulted from the project:

- Two invited papers (Meinke & Selvaraju) and 6 posters (Hansen, Aslam, Selvaraju, Boer, Gadgil, Donald) presented by team members at the 4th ICSC; and
- Meinke and Stone have published a major article in "Climatic Change" 2005 that draws extensively on work funded by this APN project.

Self-evaluation:

To be conducted at the final project meeting, South India, August 2005.

Future directions and follow-up work:

To be developed at the final project meeting, South India, August 2005.

**Water Resources in South Asia: An Assessment of Climate
Change-associated Vulnerabilities and Coping Mechanisms
(APN 2004-02-CMY)**

Project Leader:

Dr. A. MUHAMMED

President, Asianics Agro-Dev Int.

P.O. Box 2316, Islamabad

PAKISTAN

Tel: +92-51-2276-424

Fax: +92-51-2276-492

Email: asianics@isb.comsats.net.pk

Water Resources in South Asia: An Assessment of Climate Change-associated Vulnerabilities and Coping Mechanisms (APN 2004-02-CMY)

APN funding:

Year 1: (APN 2002-12) US\$ 60,000

Year 2: (APN 2003-04) US\$ 60,000

Year 3: (APN 2004-02-CMY) US\$ 60,000

The Hansen Institute for World Peace (HIWP), San Diego, USA, provided financial support to cover the multi-media activities and to facilitate the participation of the multi-media experts in the year-end meeting, in Chiang Mai, as part of the HIWP collaboration with the project.

Participating countries:

Participants from the following countries were funded: Bangladesh, India, Nepal, Pakistan, and the USA.

Abstract:

Among the regions of the world, South Asia is the most sensitive to global climate change. This region depends heavily on the precipitation of the variable regional monsoon as well as water derived from the glacier melt in the Himalayas; both of which are being affected by climate change.

The three-year project focused on the following activities:

- Analysing recent experiences in climate variability and extreme events, and their impacts on regional water resources;
- Assessing the impacts of projected climate change and variability and associated extreme hydrological events and socio-economic changes on the water resources of Bangladesh, India, Nepal, and Pakistan;
- Determining the vulnerability of regional water resources to climate change, and identifying key risks to each sub-region and prioritising adaptation responses;
- Evaluating the efficacy of various adaptation strategies or coping mechanisms that could reduce vulnerability of the regional water resources; and
- Providing input to relevant national and regional long-term development strategies for mitigation of the adverse impacts.

Activities conducted:

- Preparation of regional maps of climate variability and change to identify areas at risk, in terms of water availability and agriculture;
- Preparation of draft project reports;
- Stakeholder meetings at the national level, with participation from experts and policy-makers;
- Preparation of final reports and its dissemination to selected stakeholders (planned);

- Publication of peer-reviewed articles in a special issue of the journal “Science and Culture”; and
- Preparation of the synthesis report for the entire project. The report will be published as a book for wider dissemination.

Outcomes:

All objectives of the project for the third year were achieved, with the exception of the organisation of an exposure meeting of technical experts and climate modellers in the Indian Institute of Tropical Meteorology (IITM), Pune, India.

Product outputs:

- Regional maps of climate variability and change, with areas at risk identified.
- Draft project reports;
- Stakeholders’ meetings organised in Dhaka (Bangladesh), Calcutta (India), Islamabad (Pakistan) and Kathmandu (Nepal);
- Presentations were made using the final reports and presented at the stakeholders’ meetings;
- Articles have been prepared to go into a special issue of Science and Culture;
- Synthesis reports on floods and droughts have been prepared; and
- Findings of the project are being compiled for publication as a book for wider dissemination.

Self evaluation:

The project brought together scientists from several disciplines of meteorology, climate science, hydrology, economics and agriculture, to study climate change, in the participating countries of the region, during the last century and trends for the next 25 years; the impact of climate change on water resources; and the incidence of extreme events. Policy-makers have demonstrated a keen interest in the project because of its importance in planning the harnessing of future water resources in light of anticipated climate change. Due to the expected water shortages, the urgency to develop new techniques to improve water use efficiency for crop production has been widely appreciated; water is fundamental for agriculture products in a large part of the sub-continent. Furthermore, the use of multi-media techniques is likely to prove very effective. These multi-media techniques were developed as a part of the project activities to disseminate the improved technology, especially to illiterate farmers.

Future directions and follow-up work:

Preparation of the final project report is underway. The project findings will be published in the May-June issue of Science and Culture. Planning is also underway to publish a book based on the activities of this project for wider distribution to scientists and policy-makers. A two-page summary for policy-makers is also being prepared, which will be a useful resource for communicating the findings of the project to policy-makers for incorporating into national policies.

**Inventory of Glaciers and Glacial Lakes and the Identification
of Potential Glacial Lake Outburst Floods (GLOFs) Affected
by Global Warming in the Mountains of India, Pakistan and
China/Tibet Autonomous Region (APN 2004-03-CMY)**

Project Leader:

Dr. J. G. CAMPBELL

Director-General

International Centre for Integrated Mountain Development (ICIMOD)

G.P.O. Box 3226, Kathmandu

NEPAL

Tel: +977-1-552-5313

Fax: +977-1-552-4509

Email: gcampbell@icimod.org.np

bshrestha@icimod.org.np (Mr. Basanta Shrestha)

pmool@icimod.org.np (Mr. Pradeep Mool)

Inventory of Glaciers and Glacial Lakes and the Identification of Potential Glacial Lake Outburst Floods (GLOFs) Affected by Global Warming in the Mountains of India, Pakistan and China/Tibet Autonomous Region (APN 2004-03-CMY)

APN funding:

Year 1: (APN 2002-15) US\$ 77,340

Year 2: (APN 2003-05) US\$ 75,000

Year 3: (APN 2004-03-CMY) US\$ 67,000

Participating countries:

Participants from the following countries were funded: China, India, and Pakistan.

Abstract:

The study of Tista basin, in India, Astor basin, in Pakistan and Pumqu basin, in China was carried out during the first year. During the second year, studies continued in the following basins: Poiqu and Rongxer in Tibetan Himalaya of China; Himachal Pradesh Himalaya of India; and five north-eastern basins: upper Indus Trunk River, Jhelum, Shingo, Shyok and Shigar basins of Indus Basin in Pakistan Himalaya. In continuing this initiative into the third year, the study expanded to the remaining sub-basins of Ganges Basin, in China in collaboration with CAREERI and BHT, other sub-basins of the Indus Basin in Pakistan in collaboration with WRRP of NARC, and the Uttaranchal Himalaya in India in collaboration with Wadia Institute of Himalayan Geology (WIHG) of India. Experts from ICIMOD, CAREERI, BHT, WRRP and WIHG are undertaking a comprehensive inventory and GIS database of glaciers and glacial lakes using available maps, satellite images, data and reports at different scales.

Activities conducted:

- Consultation meetings with collaborating institutions and agencies;
- Acquisition of satellite images (Landsat TM and ETM+, IRS 1C LISS3, CBERS, ASTER) of the project area;
- Acquisition of topographic maps and other necessary data (e.g. meteorological and hydrological data);
- Development of training materials, for the inventory of glaciers and glacial lakes, using Geographic Information System (GIS) and Remote Sensing (RS);
- Strengthened institutional capacities by training participants of collaborating institutions and agencies at ICIMOD;
- Provided GIS and RS technical support to participating institutions and agencies;
- Training of professionals of the participating countries in their own institutions and agencies on inventories of glaciers and glacial lakes using RS and GIS; and
- Preparation of a digital database of GLOFs of the Uttaranchal Himalaya of India, sub-basins of the Ganges in China and the Indus basin of Pakistan, using GIS and RS.

Outcomes:

- Digital satellite images of Landsat7ETM+, IRS 1C LISS3, CBERS and ASTER of the project areas;
- Digital topographic maps at the scale of 1:500,000 of the study areas;
- Upgraded/established the RS and GIS facilities at the institutions and agencies;
- Training manual and materials for the inventory and study of glaciers and glacial lakes, using GIS and RS; and
- Strengthened institutional capacities through a training workshop in August 2003, at ICIMOD for collaborators from China, India and Pakistan in RS & GIS technologies on inventories of glaciers and glacial lakes.

Product outputs:

- Trained professionals of the participating countries through on-the-job training in their own institutions and agencies for the inventory of glaciers and glacial lakes using RS and GIS;
- Digital satellite and topographic map data;
- Digital database of glaciers and glacial lakes of Uttaranchal Himalaya of India, the sub-basins of the Ganges of Tibet Autonomous Region, and of the PR China and Indus basin of Pakistan; and
- Documentation of glaciers, glacial lakes and potential GLOFs and associated hazards.

Self-evaluation (against original proposal objectives):

The developed database will significantly enhance the ability of global and regional climate researchers, national policy-makers and water resource planners, as well as the general public, to understand and mitigate GLOF-associated hazards. It is difficult to cover the entire Hindu Kush Himalaya region of India, Pakistan and the China/Tibet Autonomous Region within the limited time-frame and budget; such an extensive study would require a few more years to complete.

Future directions and follow-up work:

- Analyse and synthesise the database to locate hot-spots and potential GLOF circumstances, and dissemination of the results to the concerned agencies;
- Conduct rapid environmental change assessment (RECA) studies on GLOF hazard risks and potential impacts;
- Prepare analytical studies and briefing papers for policy-makers/planners, to be presented at regional/international workshops and conferences;
- Distribute, through the participating country organisations, publications on potential GLOF hazards and risks and their potential impacts and mitigation; and
- Comprehensive communication and dissemination plan developed and implemented based on the results and outputs of database analysis. Such a plan would strengthen policy and planning within the relevant agencies, and inform research institutions and the public, at national and regional levels. Collaborating countries held one-day workshops in Lhasa, Islamabad and DeharaDun, in February and March 2005, to present the results of the studies for discussion and future planning.

**Regional, Multi-scaled, Multi-temporal Land Use and Land
Cover Data to Support Global Change Research and Policy-
Making: A SEARRIN LUCC Project (APN 2004-04-CMY)**

Project Leader:

David L. Skole

Center for Global Change and Earth Observations
Michigan State University
1405 South Garrison Road, Suite 101
East Lansing, MI 48823

USA

Tel: +1-517-432-7774

Fax: +1-517-353-2932

Email: skole@msu.edu

Regional, Multi-scaled, Multi-temporal Land Use and Land Cover Data to Support Global Change Research and Policy-Making: A SEARRIN LUCC Project (APN 2004-04-CMY)

APN funding:

Year 1: (APN 2003-08) US\$ 75,000

Year 2: (APN 2004-04-CMY) US\$ 42,500

Participating countries:

Participants from the following countries were funded: Cambodia, China, Indonesia, Lao PDR, Malaysia, Philippines, Thailand, the USA, and Viet Nam.

Abstract:

This SEARRIN-LUCC project aims to develop a suite of accurate, validated geospatial data products of land use and land cover change for Southeast Asia at the regional and case study levels. In addition, the project will develop data portals via the Internet for access to the data by the global research and policy-making community. This will be accomplished by using web-based GIS applications. Furthermore, the collaboration between the SEARRIN-US team, led by Michigan State University (MSU), and the SEARRIN teams, from each of the eight regional countries, allows for data sharing and capacity building.

Activities conducted:

The following activities, most of which have been completed, are being conducted:

- Field work in Lao PDR and Viet Nam;
- Workshop in Ho Chi Minh City, Viet Nam with Nong Lam University and Forest Inventory and Planning Institute;
- Pre-planning meeting with Mekong River Commission Secretariat and National University of Lao PDR, Faculty of Forestry; Tam Dao National Park Paper (internal review); V0 Regional Analysis validation 80% complete;
- V1 case study fractional cover data acquisitions, analysis, field work 70% complete; and
- The development and installation of a Spatial Decision Support System data node, at the National Mapping and Resource Information Authority (NAMRIA), Philippines by an MSU graduate student from NAMRIA.

Outcomes:

The focus of the project has been on the following three areas:

- Development of validated land use and land cover datasets;
- Development of systems for access to information; and
- Capacity building.

SEARRIN country teams have conducted expert analysis of remotely sensed data that is being used to validate the regional forest cover datasets developed at MSU. The SEARRIN teams have also conducted fieldwork. In situ measurements were collected to validate and calibrate continuous field measurements of forest cover at a series of case-

study sites. Additionally, the project leader and research scientist from MSU conducted field surveys from Lao PDR and Viet Nam.

In early January 2005, a data node was installed at NAMRIA in the Philippines, to serve as an access point for geospatial data. In August 2004, a training and science workshop was conducted in collaboration with Nong Lam University and Forest Inventory and Planning Institute, Viet Nam; participants exceeded 50.

Product outputs:

- Eighty percent of the forest cover validation is complete and 70% of the forest fractional cover assessment has been completed;
- Field data is being compiled in a database. These products (maps and in situ data and measurements) will eventually be accessible through a web-based GIS data portal. The data node has been developed and established at NAMRIA, Philippines and is undergoing testing before going on-line;
- A CD-ROM, compiled from presentations, was produced as a result of the workshop in Nong Lam University; and
- A draft paper of the Tam Dao National Park analysis is being reviewed internally.

Self-evaluation:

We have accomplished a number of our objectives to a satisfactory level. The establishment of the data node in NAMRIA, following extensive training at the graduate level in GIS Science for one member of the NAMRIA IT staff, the continued capacity building via workshops and email communications, and the on-going validation of the products, has been accomplished.

We took advantage of the opportunity to co-host a workshop in Viet Nam to further the training component of the project. We also met with the Mekong River Commission Secretariat to establish a dialogue that may lead to an appropriate outlet for the data and information developed under this project. We have been less successful in developing the full suite of products from the multiple satellite data initially proposed, primarily due to the costs of the data and for the personnel who conduct the analyses. Probably the most exciting aspect of the project has been the identification of relevant and current case study topics to natural resource monitoring and management in the region. These include: mangrove systems, in Southern Viet Nam; trans-border contract farming, in Thailand and Cambodia; and the dynamics of upland swidden systems, in Lao PDR. Our goal is analyse data specific to these case studies as part of the project.

Future directions and follow-up work:

In the final five months of the project, the following activities will be completed:

- Regional workshop and training in Lao PDR;
- Capacity building through advanced training of Dr. Do Xuan Lan, FIPI, Viet Nam; he will stay at MSU for one month as a visiting scholar; and
- Final development of the project website; this will include an operational web-based GIS data portal. In addition, project colleagues are preparing manuscripts of the research to be submitted for peer review publication.

**Building Local Capacity for Global Change Research: The
Millennium Ecosystem Assessment Sub-Global Activities in
the Asia-Pacific Region (APN 2004-05-CMY)**

Project Leader:

Dr. W. REID

Director

Millennium Ecosystem Assessment

World Fish Center, GPO

10670, Penang

MALAYSIA

Tel: +60-4-6261-606

Fax: +60-4-6265-530

Email: reid@millenniumassessment.org

Building Local Capacity for Global Change Research: The Millennium Ecosystem Assessment Sub-Global Activities in the Asia-Pacific Region (APN 2004-05-CMY)

APN funding:

US\$ 23,000

Participating countries:

Participants from the following countries were funded: Australia, China, India, Indonesia, Nepal, Philippines, and Thailand.

The following participants were funded through other contributions: Brazil, Canada, Chile, Colombia, Egypt, Peru, Portugal, the Russian Federation, South Africa, Sweden, Trinidad, Tobago, USA, and Zimbabwe.

Abstract:

In March 2005, findings from the largest-ever assessment of the connections between ecosystem health and human well-being, the Millennium Ecosystem Assessment (MA), will be released. Central to the MA design is a set of 'sub-global assessments' conducted at levels ranging from local communities to multi-country regions. The APN funds were used to increase the participation of Asia-Pacific researchers in two core activities: a workshop on modelling and scenario-building (in 2003), and meetings of the MA Sub-global Working Group (in 2004). These activities were designed to: 1) improve the technical capabilities of scientists, in the region, to develop and quantify future scenarios of ecosystem change; 2) build regional cooperation, in the area of ecosystem change research, through the exchange of data and best practices; and 3) increase the participation of scientists, in the region, in global change research. Increased capacity to carry out integrated ecosystem assessments will contribute to improved environmental decision-making at every scale of governance.

Activities conducted:

The MA Sub-global Working Group met on 26-30 September 2004, in Kuala Lumpur, Malaysia, in conjunction with the final combined meeting of the MA working groups. This meeting took place following the first cycle of peer reviews of the draft chapters of the Sub-global Working Group report. The report synthesises findings and best practices from the MA sub-global assessments. The focus of the Sub-global Working Group was to respond to review comments received, and to revise the draft chapters in light of the review comments. The revised draft chapters were subsequently sent for a second round of review in October 2004, with planned finalisation and publication during 2005.

Outcomes:

Capacity to carry out integrated assessments of ecosystem change and human well-being has been strengthened among researchers, in the Asia-Pacific, involved in the MA sub-global assessments. This is substantiated by the application of the MA conceptual framework, and the progress made in completing the sub-global assessments in China, India, Philippines, and Viet Nam, by researchers in those countries who were not

previously familiar with integrated ecosystem assessments. In addition, the meetings of the MA Sub-global Working Group, and the writing of the working group report, involved scientists based in Australia, Indonesia, Nepal, and Thailand, thereby strengthening capacity in other Asia-Pacific countries and helping to create a network among these researchers in the region. The participation of young scientists in the working group meetings has added yet another dimension to capacity-building, specifically among the assessment teams in China, Philippines, and Viet Nam. At the same time, all of the assessment teams have benefited from communications and exchange of experiences, methods and best practices between other MA sub-global assessments. Particularly, those assessments in southern Africa, Europe, and South America

The sub-global assessments in the Asia-Pacific also meet the needs of decision-makers for information on the consequences of ecosystem change for human well-being. The focal issues of the assessments were identified through consultations with decision-makers, who are also now involved in the review of the assessments results.

Product outputs:

The MA's Sub-global Working Group report is on course for release in 2005, as part of the core of MA publications. In addition, assessment reports from individual sub-global assessments, including those in China, India, Philippines and Viet Nam, are being finalised and will be available in 2005. The assessments are targeted primarily for decision-makers in the locations where the assessments took place.

Self-evaluation:

The MA Secretariat has carried out the project activities as planned, and the delivery of the outputs is on track. Many of the sub-global assessments are providing useful findings for decision-makers, while simultaneously building capacity among researchers. The sub-global assessments have provided significant insight on working across scales, incorporating different knowledge systems. Based on the experience from the MA's sub-global assessments, future sub-global assessment processes, similar to the MA, should ensure that sufficient funds are available to subsidise the full work of the assessments planned, and provide sufficient time for the completion of sub-global assessment work and subsequent interaction with the global assessment.

Future directions and follow-up work:

Together with partners such as ICSU, UNEP, UNDP, UNESCO, IUCN, and WRI, the MA is proposing a consortium of institutional partners to follow-up on the activities and outcomes of the MA process, to be funded by GEF and the World Bank. Elements of this proposal are of particular relevance to the activities supported by the APN, including: 1) delivering training on integrated assessment methods and tools in collaboration with regional training institutions; 2) supporting broader dissemination of the findings of the sub-global assessments to decision-makers in the respective locations; 3) in partnership with ICSU, developing priorities for further place-based research on ecosystems and human well-being; and 4) maintaining and expanding the community of practice and network of research activities of sub-global assessments of ecosystems and human well-being.

**The Mega-Deltas of Asia: A Conceptual Model and its
Application to Future Delta Vulnerability
(APN 2004-06-CMY)**

Project Leader:

Prof. Z. CHEN

Department of Geography
East China Normal University
Shanghai 200062

CHINA

Tel: +86-21-6223-2706

Fax: +86-21-6223-2416

Email: Z.Chen@sklec.ecnu.edu.cn

The Mega-Deltas of Asia: A Conceptual Model and its Application to Future Delta Vulnerability (APN 2004-06-CMY)

APN funding:

Year 1: US\$ 35,000

Year 2: US\$ 33,537

Participating countries:

Participating countries funded were: Australia, Bangladesh, Cambodia, Canada, China, Finland, India, Iran, Japan, Pakistan, Singapore, Sri Lanka, Thailand, the US, and Viet Nam. Participating countries supported by funds other than the APN include: Brunei, Germany, Malaysia, the Netherlands, Philippines, the Republic of Korea, and the UK.

Abstract:

This two-year project focuses on developing a conceptual model for the geological process and response of Asian mega-deltas, affected by strong monsoons, high river flow and sediment load, and frequent geo-hazard occurrences. Previous databases will be integrated by many experienced Asian delta scientists, each working with specific geological issues: 1) subsidence from underground water withdrawal; 2) sea-level rise impacts; and 3) coastal erosion, saltwater intrusion, and river channel dry-up from damming and water diversion. Databases will be further incorporated with new field measures to better understand the geological framework of the delta basin. Thus, we hope to allow for substantial improvement and mitigation policies, which most often rely on oversimplified models because of insufficient data and/or lack of solid observations. Two workshops are planned: 1) to develop the Asian delta model and 2) a forum for Asian scientists and policy-makers to better understand long-term coastal management.

Activities conducted:

As the successor of the year-one workshop, this year-two APN funded workshop was also organised and held in Ho-Chi-Minh City, Viet Nam, 10-17 January 2005 (www.megadelta.ecnu.edu.cn). The workshop was jointly held with IGCP-475 and CCOP project (also headed by our APN co-leaders, Drs. Yoshiki Saito and Steven Goodbred). In total, more than 100 participants attended the workshop, of which at least 70 were international, from 22 countries and 30 were from the host country, Viet Nam. As planned, the workshop focused on critiques of delta conceptual models, based on the model establishment in the past year. Modelling and management, both on natural and human dimensions, were also major issues of the workshop. Individual Asian mega-delta models were addressed by local specialists in a series of keynote and oral presentations. During the workshop, a special session on delta-coast vulnerability, especially related to the recent tsunami disaster, was organised by invited presenters from those affected countries, including Indonesia, India, Philippines, Sri Lanka, and Thailand. Japanese scientists were also invited to present their long-term observations on how to understand tsunami events in terms of mechanisms and the prevention of major impacts. Communications among physical and social scientists, engineers, and

policy-makers were successful; lengthy discussions during poster sessions, accounted for about six hours of the three-day workshop. The workshop was beneficial for many local young scientists who are working on coastal environmental conservation. More than 20 such M.S. and Ph.D. students participated. During the conference, an open discussion for all participants was arranged to listen to feedback from the public on our project themes. Comments can be found at: (www.megadelta.ecnu.edu.cn). Pre- and post-meeting field trips took place to observe the evidence of sea-level fluctuations, sediment re-suspension, and coastal erosion of the Mekong delta coast.

Outcomes:

- Established on-going capacity networks during the first-year; four-working groups: East Asia, Southeast Asia, South Asia, and Oceania. This has certainly provided a beneficial and effective channel for all scientists and policy-makers/government administrators, who have been connected through this APN project to address all necessities relative to delta models and coastal vulnerability;
- Provided a useful venue to access the existing databases relating to delta-coast sediment sources, supplement, monsoon-driven factors, such as morphological/hydrological dynamics, high flow/sediment loads to delta sinks, and coastal hazard mitigation;
- Channelled communications among physical and human scientists, and policy-makers through our website, workshops, and on-line media. This will be effective in the long-term for upgrading public awareness of environmental conservation, leading to sustainable development strategies in the near future;
- The project goal also received wider public attention. For instance, APN project leaders, Drs. Chen, Goodbred and Chen, were interviewed by Ms. Alexandra Seno, correspondent to Newsweek Magazine, via phone and email, regarding hazard prevention and mitigation during the recent tsunami event, as well as other broader threats to Asian mega-deltas. Ms. Seno discovered the APN-supported Mega-Delta project via the project website, reflecting the importance of the study and its broader impacts; and
- Circulating relevant knowledge to participating countries, including 12 developing and 10 developed countries, and regional networks.

Product outputs:

Outputs include: 1) workshop abstract proceedings and field trip guide (2-years); 2) APN Proceedings, being published by China Ocean Press: available in the late 2005; 3) APN website: www.megadelta.ecnu.edu.cn; 4) peer-reviewed papers; draft manuscripts prepared by APN leaders participants; and 5) summary of Ho-Chi-Minh Workshop on CD-ROM.

Self-evaluation:

This APN Mega-Delta project is expected to reach its goals set in the original proposal. The project promotes building capacity networks, synthesising existing databases, and improving communications between scientists and society. This will strengthen our resolve for long-term collaboration regarding future environmental delta-coast conservation.

Directions and follow-up work:

Since there have been fruitful results obtained: established capacity networks, existing database, and channelled communication systems, we all agree that it is imperative for further collaboration through new funding, aimed at: 1) regional workshops to disseminate information; 2) field work in some selected key areas; and 3) continuation of our efforts to expand the knowledge of delta models. Such efforts are already underway with the joint IGCP-475 DeltaMAP and CCOP DelSEA project co-led by Drs. Goodbred and Saito. However, the APN Mega-Delta leaders and participants need further funds to continue work already carried out by this APN project.

**Integrating Carbon Management into Development Strategies
of Cities - Establishing a Network of Case Studies of
Urbanisation in the Asia-Pacific (APN 2004-07-CMY)**

Project Leader:

Prof. R. D. LASCO

World Agroforestry Centre (ICRAF) Philippines
2/F College of Forestry & Natural Resources Administration Building
K.P. Los Banos, College, Laguna

PHILIPPINES

Tel: +63-49-536-2925

Fax: +63-49-536-4521

Email: rlasco@laguna.net

Integrating Carbon Management into Development Strategies of Cities - Establishing a Network of Case Studies of Urbanisation in the Asia-Pacific (APN 2004-07-CMY)

APN funding:

Year 1: (APN 2003-16) US\$ 33,000

Year 2: (APN 2004-07-CMY) US\$ 24,000

Participating countries:

Participants from the following countries were funded: India, Indonesia, Philippines, Singapore, Thailand, and Viet Nam.

Abstract:

The overall goal of the project was to explore how carbon management could be integrated into the development strategies of cities and to understand the present trends and possible scenarios of urbanisation and urban transformation, in the region. The project commenced by implementing a comparative study within the following selected core cities in Asia: Ho Chi Minh, Jakarta, New Delhi, Metro Manila and Chiang Mai.

In April 2004, USER held a conference, electronically, to critique the progress of various ongoing case studies, as well as to provide opportunities for input from researchers in other regions, particularly Europe and North America. Although the web-based conference did not bring in external contributions, it was nevertheless beneficial for the current project members. In January 2005, a synthesis meeting, aimed to synthesise the preliminary analyses of the case studies, was held in Chiang Mai, Thailand. During the meeting, the first draft of the country case study reports and the synthesis report were presented and discussed. The synthesis report drew lessons and insights from the case studies and other related studies and experiences.

Activities conducted:

- Web-based conference "Integrating Carbon Management into Development Strategies of Cities," 7 June- 17 July 2004;
- Synthesis Meeting "Integrating Carbon Management into Development Strategies of Cities: a Combined APN and SARCS Workshop," 6-8 January 2005, Chiang Mai, Thailand;
- Five country case study reports; and
 - 1) Integrating Carbon Management into the Development Strategies of the Cities: Draft Report on the Delhi case study;
 - 2) Integrating Carbon Management into the Development of Metro Manila and Laguna Lake Basin;
 - 3) Integrating Carbon Management into the Development Strategies of Ho Chi Minh City and Surroundings;
 - 4) Carbon and the City: Carbon Pathways and Decarbonisation Opportunities in Greater Jakarta; and
 - 5) A Carbon's Eye View of Urbanisation in Chiang Mai: Improving Local Air Quality and Global Climate Protection;

- Synthesis Report: Integrating Carbon Management into Urban Development in Asia: a Preliminary Synthesis.

Outcomes:

- Synthesis report and the five country case study reports completed as planned;
- Drafts are available for viewing on shared web community pages (www.sea-user.org/communities.php); and
- Public information available on UTURN website.

Product outputs:

- First draft of country case study reports, by project leaders; and
- Synthesis report resulting from the case study reports.

Future directions and follow-up work:

- Edited working papers compiled into a final activity report to the APN by 1 March 2005;
- Submission of the final Financial Report to the APN by 1 March 2005;
- Case studies and synthesis reports made available on-line in 'Working Paper Series' by 5 March 2005;
- Distribution of final reports, papers and other meeting materials to all meeting participants, in CD format, by 5 March 2005;
- Decision on final publication format for case studies by 1 April 2005; and
- Submission of the synthesis report to a journal by 1 May 2005.

**SOLAS Science 2004: Travel Fund for Young Scientists
(APN 2004-08-NSY)**

Project Leader:

Associate Prof. M. UEMATSU
Ocean Research Institute
Centre for International Cooperation
University of Tokyo
1-15-1 Minamidai, Nakano
Tokyo, 164-8639
JAPAN
Tel: +81-3-5351-6533
Fax: +81-3-5351-6533
Email: uematsu@ori.u-tokyo.ac.jp

SOLAS Science 2004: Travel Fund for Young Scientists (APN 2004-08-NSY)

APN funding:

US\$ 20,000

Participating countries:

Participants from the following countries were funded: Bangladesh, China, India and Thailand.

Additional funding for the SOLAS Science 2004 came from the following sources, other than APN:

- \$7,500 from SCOR, for developing country scientists. The excess costs of the APN young scientists were funded from this grant;
- \$15,000 from SCOR, for the operational costs of the conference;
- \$3,000 from IAI, for supporting young scientists from the Americas;
- \$11,000 from the UK SOLAS for the attendance of UK students; and
- \$2,000 from the SOLAS IPO, for supporting other young scientists.

Abstract:

SOLAS (Surface-Ocean Lower Atmosphere Study) Science 2004 was the first international conference to present the results of SOLAS. It was held in Halifax, Nova Scotia, Canada from 13-16 October 2004. In total, 222 participants from 24 countries, including APN countries: Australia, Bangladesh, China, India, Indonesia, Japan, New Zealand, the Russian Federation, Thailand, and the USA, attended the event. The aim of the conference was to provide an opportunity for building multi/interdisciplinary linkages and broadening participation in SOLAS, by encouraging an enhanced level of cooperation in planning and execution of research among many different disciplines in the environmental sciences. This involved educational and capacity building efforts to bring together young and established researchers for the mutual exchange of ideas and experience, from countries with developed and developing science bases. The APN travel fund enabled eight young researchers from developing countries across the APN region to attend the conference.

Activities conducted:

Eight young scientists were selected, as recipients of the travel fund, from over 40 applications by a careful review process. During the conference, 19 speakers from 10 different countries gave wide-ranging educational plenary talks covering the broad range of multidisciplinary science spanned by the domain of SOLAS. Discussions on current SOLAS hot topics of uncertainty took place, to which all were invited. Three sizable poster sessions were held on separate days of the conference, providing a forum for international junior and senior scientists and students, including the APN-supported young scientists, to present their research to the community.

Outcomes:

We were able to fully fund the attendance of eight young scientists from developing countries in the APN region, giving them opportunities to liaise with, and present their

results to the international SOLAS community. The travel fund succeeded in building capacity by enabling SOLAS to identify young scientists in the APN region, and also by exposing young scientists from APN countries to the latest SOLAS Science.

The APN-funded scientists from China and India were able to see how their institute's research related to the SOLAS network already established in their countries, thus adding another branch to their national SOLAS networks. In addition, young scientists from Bangladesh, and Thailand, countries yet to have built up a national network, will be able to bring links between science in their countries and the international SOLAS work.

Product outputs:

The plenary talks were published on the SOLAS website and can be viewed at (<http://www.uea.ac.uk/env/solas/ss04.html>). Science highlights and reports of the discussion sessions from the conference were published in SOLAS News, January 2005.

Self-evaluation:

The SOLAS Science conference ran smoothly, and we have received positive feedback from the APN supported scientists relating to the well-structured platform provided for discussing and sharing their SOLAS Science with the international community.

It is apparent to us that the APN-supported scientists have built on local knowledge about the SOLAS network, as since the conference we have received interest and correspondence from other individuals at the APN young scientist's institutes.

Future directions and follow-up work:

The young APN scientists have been added to the SOLAS mailing lists to receive bulletins on SOLAS Science and news of further SOLAS events. Some have been in contact since the event and may be included in workshops and task teams being organised this year such as a workshop entitled "Implementing SOLAS in Asia" running in June this year.

Further SOLAS Science conferences are planned to take place on a bi-annual basis. In addition, every other year SOLAS holds an international summer school specifically designed for education and capacity building within the international SOLAS community. Attendance from scientists from the APN region will be encouraged.

**Biodiversity Measures in Different Biomes: Challenge for the
Next Decade (APN 2004-09-NSG)**

Project Leader:

H.E K. MUTH

Ministry of Environment

48, Samdech Preah Sihanouk Street, Phnom Penh

CAMBODIA

Tel: +855-16-821-180

Fax: +855-23-219-287

Email: moe@online.com.kh

Biodiversity Measures in Different Biomes: Challenge for the Next Decade (APN 2004-09-NSG)

APN funding:

US\$ 15,000

Participating countries:

Participants from the following countries were funded: Cambodia, Lao PDR, Viet Nam, New Zealand, and the UK.

Abstract:

A two-day scoping workshop was held in Phnom Penh, Cambodia from 16-17 September 2004, to focus on the proposal, "Biodiversity Measures in Different Biomes: Challenge for the Next Decade" that was submitted to the APN for funding in September 2003. The reviewers suggested redrafting the proposal and providing comprehensive details about the project and its activities. The application would then be considered for funding following its resubmission, in November 2004. The scoping workshop, in Phnom Penh, was hosted by the project leader, Khieu Muth of the Ministry of Environment, Cambodia; and key participants from the original proposal were present. This workshop provided the opportunity to bring in other experts in the biodiversity field. Participants from Cambodia, Lao PDR, and Viet Nam were in attendance, with the purpose of gaining a more extensive understanding of the priority biodiversity issues in the Indochina region. During the meeting, it was decided to focus the new proposal on one biome, the tropical forest in the Indochina region. This was deemed appropriate as the national borders (and hence policies and science approaches) of these countries cut across the natural boundaries of this forest ecosystem, and there are diverse demands from different elements of those nations' societies on biodiversity.

Activities conducted:

Focus meeting

Day 1

- Opening;
- Outlined meeting objectives;
- Presentations on the situation of biodiversity in Cambodia, Lao PDR, and Viet Nam;
- Discussion on priority biodiversity issues in the Indochina region; and
- Prioritising objectives for the new proposal.

Day 2

- Discussion about the content of the new draft proposal;
- Redrafted proposal; and
- Allocation of participants' duties and responsibilities.

Outcomes:

The following are comments from the first proposal: 1) the objectives should have been more apparent; 2) exploring such an extensive scope of biomes was too ambitious for this project and 3) the outcomes should be disseminated to scientists, policy-makers and decision-makers, alike. It was decided that the initial methodology for measuring biodiversity change could be established by focusing on the tropical forest biome. Therefore, it made sense to confine the redraft to the Indochina region. The targets were refined according to the new remit. The main objective of the proposal is to engage not just scientists, but also locals who use the forests' resources, policy-makers, managers, and developmental and governmental agencies. The outputs are, therefore, orientated towards these groups with policy documents and press releases to be translated into the language of each country so that information reaches not only those that work in the field but locals whose existence depends on the forest biome.

Project outputs:

- To establish a project website;
- To develop an agreed set of biodiversity change measures for tropical forests (first workshop) and recommend them to agencies within each country, a scientific synthesis paper (co-ordinated by bioSUSTAINABILITY);
- To communicate science-based recommendations to the group of people responsible for formulating policy. The information will be disseminated in the form of a two-page policy brief, translated into the languages of each region, and sent to governmental and developmental agencies. This can also be used to create media interest in the region; and
- To evaluate the effectiveness of current biodiversity policy instruments (second workshop).

Self-evaluation:

The meeting was successful and extremely valuable. A new, more focused, proposal was written, incorporating the reviewers' comments and suggestions. The new proposal was submitted to the APN for funding last November. Each participant clearly understands the goals of the proposal; his/her role subsequent to its submission and the necessary organisation of the workshops. Everyone was pleased that the new proposal addressed issues that are relevant and fundamental to their country, and the Indochina region as a whole.

Future directions and follow-up work:

If this proposal is accepted and the workshops go ahead, there are additional areas of expansion:

- If the approach in this proposal can be validated using the tropical forest biome it is intended to apply it to all biomes in the region over the next decade; and
- The participants of the meeting were interested in developing local outreach schemes for biodiversity education in the region; potential sources of funding were discussed.

**Climate Interactions and Marine Ecosystems: Effects of
Climate on the Structure and Function of Marine Food-Webs
and Implications for Marine Fish Production in the North
Pacific Ocean Marginal Seas (APN 2004-10-NSY)**

Project Leader:

F. E. WERNER

Marine Sciences Department
University of North Carolina at Chapel Hill
12-7 Venable Hall, CB# 3300
Chapel Hill, NC 27599-3300

USA

Tel: +1-919-962-0269

Fax: +1-919-962-1254

Email: cisco@unc.edu

Climate Interactions and Marine Ecosystems: Effects of Climate on the Structure and Function of Marine Food-Webs and Implications for Marine Fish Production in the North Pacific Ocean Marginal Seas (APN 2004-10-NSY)

APN funding:
US\$ 45,000

Participating countries:

Participants from the following countries were funded: China, Japan, Republic of Korea, the Russian Federation, and the USA. Participants from Canada were funded by PICES, the North Pacific Marine Science Organisation (<http://www.pices.int>).

Abstract:

The project's overall hypothesis is that global climate change can alter both the structure and function of the marine ecosystem, causing changes in energy cycling, plankton composition and dynamics, and ultimately fish production. The objectives of the project include: 1) to use a common marine food-web and fisheries bioenergetics modelling approach, along with long-term area-specific datasets, to understand the propagation of climate change effects on the marine food-web; 2) to quantify its effects on energy cycling and fish growth and production in distinct regions in the North Pacific; and 3) to initiate a discussion of how these results can be integrated into the decision-making process by resource managers.

Activities conducted:

With Pacific herring as the initial target fish species, we conducted a successful workshop entitled "Climate Interactions and Marine Ecosystems" held in Honolulu, Hawaii from 10-13 Oct 2004 (see PICES Newsletter, 13(1), 2005). The workshop activities focused on addressing three sub-hypotheses:

Sub-hypothesis 1: Geographic variations in fish growth can be explained by differences in environmental conditions and resulting differences in lower trophic conditions. We:

- Identified locations with available datasets for lower trophic levels (LTLs) calibration;
- Cross-referenced the LTL target list with locations that may have data on Pacific herring, sardines, anchovy, mackerel and other potential target species;
- Developed a strategy for analysis of these data via a coupled LTL and fish model to address the hypothesis on geographic variability; and
- Agreed to compile the available datasets with final site and target species selection to be determined depending on the quality of the available information.

Sub-hypothesis 2: Synchronous (or asynchronous) changes in herring growth rates across locations may be accounted for by basin-wide decadal-scale changes in environmental conditions. With full-basin scale solutions as targets for the study of regime shifts in the longer term, an agreed target for the next six months is to implement

and study the response of point LTL and coupled LTL-fish models at selected sites in the North Pacific for various regime periods.

Sub-hypothesis 3: Future climate and global change scenarios may affect fish production through changes in the structure of the lower trophic levels. It was agreed at the workshop that exploratory tests of the effects of future conditions would be conducted by changing bulk model parameters. The changes imposed would be guided by the basin scale model results and other sources, e.g. IPCC reports.

Outcomes:

The outcomes have been in accordance with the proposed activities and in some instances, such as the identification of additional target fish species; we believe we may have been able to exceed our expectations, as a result of the capacity sharing collaborations established with our colleagues.

Product outputs:

At this stage, the workshop's success and the resulting activities that are being conducted are the main products to date. There are two additional areas that should result in tangible products in the form of datasets and papers. These are:

- Links to management - the discussions of the relevance of our model products to management led to the following observations: 1) correlations between size-at-age (SAA) and fish biomass (and their fluctuations) exist for some species; 2) providing information on SAA can be a useful indicator of population health; and 3) SAA allows us to better understand fish mortality vis-à-vis bottom-up (fishing-independent) factors.
- Capacity sharing - discussions among workshop participants resulted in the following gains: 1) preliminary model codes were explained and distributed; 2) novel quantitative methods to study model sensitivity were discussed and adopted by the group; and 3) new target species (e.g., anchovy, sardines) were identified for future consideration as were the associated data needed for model development and analysis.

Self-evaluation:

We are on track to completing a successful project. We have laid out plans that could be ambitious in some aspects, and as such, we need to ensure that all parties are able to deliver the various components that were agreed on at the workshop.

Future directions and follow-up work:

Our main targets are to complete the above work and publish it in the primary literature; fisheries science and resource management. We also intend to present results of the work at international conferences during the course of this year.

**Institutional Capacity in Natural Disasters Risk Reduction: A
Comparative Analysis of Institutions, National Policies, and
Cooperative Responses to Floods in Asia (APN 2004-11-NMY)**

Project Leader:

Dr. E. NIKITINA

EcoPolicy Research and Consulting
Piluigina st., 14-1-182; 7095/9468581
117393 Moscow

RUSSIA

Tel: +7-095-1322-642

Fax: +7-095-1322-642

Email: enikitina@mtu-net.ru

Institutional Capacity in Natural Disasters Risk Reduction: A Comparative Analysis of Institutions, National Policies, and Cooperative Responses to Floods in Asia (APN 2004-11-NMY)

APN funding:

Year 1: (APN 2004-11-NMY) US\$ 35,000

Participating countries:

Participants from the following countries were funded: Japan, the Russian Federation, Thailand, and Viet Nam.

Abstract:


The Institutions for Floods in Asia (IFA) explores how to effectively shape human institutional responses to the risk of floods in Asia. Although a variety of domestic and regional policies and measures are performed, the vulnerability of people to floods remains high, in both developed and developing countries; the poor are especially vulnerable. Why are existing risk management institutions and the behaviour of actors not always effective in enhancing human security? Why do implementation failures occur? Were there any options that would have reduced the immeasurable loss from the recent tsunami tragedy? What innovations of institutions are needed? For this purpose, the IFA analyses and compares national and regional institutional regimes, policies and measures to prevent, or limit destructive effects of floods through mitigation, preparedness, emergency response and rehabilitation. Countries selected for analysis represent developed, transitional economies and developing countries (Japan, the Russian Federation, Viet Nam, and Thailand); the IFA compares lessons learned, successes and failures in institutional performance.

Activities conducted:

1) project meeting “institutional capacity in natural disasters risk reduction”; 2) four working papers; 3) development of ‘Research Protocol’ as a guide for compatible case-study analysis in four countries; 4) development of policy recommendations for practitioners, policy-makers and local NGOs; 5) selection of the IFA panel for the 6th IHDP Open Meeting in Bonn; 6) IFA presentations at: a) annual GECHS scientific committee meeting in Cape Town; b) UN ISDR headquarters in Geneva; and c) IHDP capacity building workshop for the Russian Federation in Zvenigorod; 7) expanding IFA networks to include Bangladesh, Germany, India, Philippines, the USA, and UNU/EHS; and 8) development and maintenance of IFA website (<http://www.sea-user.org/floods.php>).

Outcomes:

1) a presentation of IFA at the UNU-EHS and ADRC Workshop “Measuring Vulnerability and Coping Capacity,” WCDR, Kobe; 2) contribution to the “National Report: Disaster Risks in Vietnam” for WCDR, Kobe; 3) the nomination of IFA as a core project of GECHS/IHDP; 4) networking during the workshop on “Water Resources in South Asia: An Assessment of Climate Change-Associated Vulnerabilities and Coping Mechanisms,” Chiang Mai, Thailand, with colleagues from Bangladesh, India,

Nepal, and Pakistan; 5) a field trip by IFA partners to the Mae Ping River and Meeting with the Fai Phaya Kham Committee and the "River Care" local organisation; 6) presenting the ISDR contributions (brochures, kids' game-kit, literature, etc) to the FPK Committee; and 7)  Vulnerability, Livelihood's Security and Well Being: An Action-Research Platform and Dialogue Project on Tsunami Reconstruction." Concept Proposal, 15.01.05, Unit for the Social and Environmental Research at Chiang Mai University.

Product outputs:

The following product outputs have resulted from funding:

- Proceedings of the project meeting "Institutional Capacity in Natural Disasters Risk Reduction," USER/EcoPolicy;
- Lebel and Sinh: "Too much of a good thing: How better governance could reduce vulnerability to floods in the Mekong Region" (chapter, forthcoming);
- Kotov and Nikitina: "Institutional Frameworks for Natural Disasters Risk Reduction in the Russian Federation," In Living with Risk. A Global Review of Disaster Reduction Initiatives, ISDR, 2004;
- Kotov, Jeggle, Nikitina, Ono, and Rencoret: "Institutional Frameworks for Natural Disasters Risk Reduction" (chapter, forthcoming);
- Manuta, Lebel, Khрутmuang and Huaisai: "The Politics of Re-distributing Risks and Altering Vulnerabilities to Floods in Thailand," Vulnerability and Human Well-Being Workshop, C-Rica, January 2005;
- Manuta and Lebel: "Human Security and Climate Change: Governance of Flood Risks in Thailand." Abstract for workshop, Norway, June 2005; and
- Khрутmuang and Manuta: "Recovery and Reconstruction of People's Lives, Livelihood and Community: Emerging Opportunities and Challenges," Conf.Brief, Thailand, January 2005.

Self-evaluation:

Although IFA performed activities on a much broader scale than envisaged by the proposal, we have not yet accomplished the full range of possible outcomes. For example, there is still more to be done to assess how institutions can be more effective in enhancing human security, and to reduce the possible tragedies associated with natural disasters, especially through enhancing preparedness and rehabilitation. More assessments and comparisons are needed, both at national and local levels, to develop recommendations for better institutional performance in all partner countries.

Future directions and follow-up work:

1) IFA project workshop in Hanoi, Viet Nam, 2005; 2) publication of IFA articles in the special issue of Science and Culture, 2006; (3) publication of IFA Scoping Report, 2006; 4) organisation of IFA panel at the IHDP 6th Open Meeting in Bonn; 5) implementation of the 2nd section of IFA Research Protocol, i.e. aggregation of research results and comparative cross-country analysis; 6) joint efforts with UNU/EHS on vulnerability indicators and their testing, in application to the local communities affected by floods in Asia; 7) presentation and discussion of IFA results at UNU/EHS in Bonn; 8) assessment for the Tsunami Reconstruction of Fisheries Communities in Southern Thailand; and 9) extension the IFA network to Bangladesh, Cambodia, China, and Philippines (and possibly Indonesia).

**Role of Institutions in Global Environmental Change
(APN 2004-12-NMY)**

Project Leader:

S. SONAK

F-9, La Marvel Colony, Dona Paula – Goa

INDIA

Tel: +91-832-245-6064

Fax: +91-832-245-6053

Email: ssonak@teri.res.in

Role of Institutions in Global Environmental Change (APN 2004-12-NMY)

APN funding:

Year1: (APN 2004-12-NMY) US\$ 40,000.

Participating countries:

Participants from the following countries were funded: India, Sri Lanka, and Nepal. The following countries received funding through the INTEREST project of the European Commission: Netherlands (Wageningen University), Portugal (LNEC) and the UK (Rothamsted Research. A project meeting was held from 17-19 January 2005 and was attended by the following three teams: 1) the Energy and Resources Institute, from India; 2) the RRI, from Sri Lanka; and 3) the ENPHO, from Nepal. In addition, one participant from Delhi and two participants from Portugal attended the meeting by funding obtained from the INTEREST project.

Abstract:

The project assesses the role of institutions, particularly the environmental and resource regimes operating at local levels, in global environmental change. It will investigate how the management of resources can be improved in the context of global environmental change, by learning from a variety of management systems and their dynamics. It will also build capacity of the local communities to adapt to global change through capacity building programmes. The findings of the project will be disseminated to a wide target audience, including policy-makers, through booklets.

Activities conducted:

The following activities were conducted as a result of APN funding:

- Existing data was analysed, data gaps identified and additional data was collected, by all three teams within the first six months of the project;
- A project meeting was held from 17-19 January 2005; and
- The following capacity-building programmes were conducted: rain water harvesting, in Goa; organic farming, in Karnataka; awareness generation meetings on participatory forest management, in Haryana; and possible adaptation measures for rubber cultivation and harvesting of latex, in three different villages in Sri Lanka. Furthermore, to conduct capacity building training in Nepal, targeted beneficiaries were identified and curriculum has been developed.

Outcomes:

The following are outcomes of the aforementioned projects:

- Conceptual framework showing feedback between ecological and human systems has been worked out for all five ecosystems;
- Assessment of impacts of environmental change on the local communities in five selected ecosystems is currently underway;
- Analysis of the role of institutions, formally and informally, environment and resource management regimes in particular, operating at local levels on global

environmental change, is being conducted by focusing on selected questions for each ecosystem and using the IDGEC framework; and

- Capacity-building programmes for the local communities to help them adapt to global change are being carried out in the selected ecosystems.

Product outputs:

The following are product outputs resulting from the projects:

- A structure for the book entitled “Multiple Dimensions of Global Environmental Change” was discussed at the meeting and contributions were invited from the project team; some abstracts and one full paper have already been received;
- Research papers for the special issue of a journal were presented and discussed at the meeting; and
- Capacity-building programmes are ongoing.

Self-evaluation:

It is still too early to evaluate.

Future directions and follow-up work:

Deadlines, for submitting papers for the book and the journal, were finalised at the meeting and a list of potential invitees to contribute to the book is being prepared. “Global Environmental Change” has been identified as the most suitable journal for publication of the research papers. It is planned to approach the journal’s editor to request a special issue on “Role of Institutions in Global Environmental Change” with all research papers on the five ecosystems under study and a synthesis paper. Future programmes for capacity-building have also been discussed.

**Synergy between Ecosystem Change and Biodiversity Studies
in the Western Pacific and Asia: Establishing Case Studies for
Carbon Management and Biodiversity Conservation
(APN 2004-13-NMY)**

Project Leader:

Dr. K. KITAYAMA

DIWPA, c/o Center for Ecological Research
Kyoto University, 509-3 Otsuka, Kamitanakami-Hirano
Otsu, Shiga 520-2113

JAPAN

Tel: +81-77-5498-233

Fax: +81-77-5498-233

Email: kityama@ecology.kyoto-u.ac.jp

Synergy between Ecosystem Change and Biodiversity Studies in the Western Pacific and Asia: Establishing Case Studies for Carbon Management and Biodiversity Conservation (APN 2004-13-NMY)

APN funding:

Year 1: (APN 2004-13-NMY) US\$ 40,000

Participating countries:

Participants from the following countries were funded: China, Indonesia, Japan, Malaysia, Sri Lanka, and Viet Nam.

Abstract:

This project seeks to synergise climate change studies and the conservation of biological diversity by linking the estimation of net biome productivity with biodiversity observation in rapidly changing terrestrial ecosystems, in Monsoon Asia. The Kyoto Protocol incorporates the vital role of forests and wetlands in its mechanisms to reduce greenhouse gases, favouring fast growing plantations. The Convention on Biological Diversity (CBD) emphasises the conservation and sustainable use of forest and wetlands that harbour biological diversity. Guidelines need to be developed without sacrificing these mutually exclusive requirements. This project aims to increase the awareness of synergy between ecosystem change and biodiversity studies and to disseminate the synergy concept through: 1) organising a workshop; 2) utilising the existing DIWPA network; and 3) establishing a pilot case-study site in Borneo.

Activities conducted:

DIWPA and the State Department of Forestry, Sabah, Malaysia, jointly organised the international workshop on “Synergy between Carbon Management and Biodiversity Conservation in Tropical Rain Forests, 24-26 November 2004” in Sabah, Malaysia. This workshop was conducted to disseminate the synergy concept and to demonstrate the economically/ecologically sound production system to conserve carbon and biodiversity among foresters, policy-makers, for conservation, and other stakeholders. We have initiated a pilot site in the Deramakot Forest Reserve, in Sabah, to investigate the amount of carbon and biodiversity in a number of forests with varying degrees of degradation with various intensities of past timber extraction.

Outcomes:

A total of 92 participants from 21 local and international agencies registered at the workshop. The workshop was publicised throughout five newspaper articles. The concept of synergy was successfully disseminated to the workshop participants and local communities. The pilot site was demarcated where the conservation of biodiversity and carbon sequestration are to be harmonised. This site was visited by the workshop participants.

Product outputs:

One volume of the workshop abstracts was published. Methods to investigate carbon and biodiversity were developed, tested in the field, and suggested as standardised methods. A new algorithm to estimate the amount of carbon in tropical rain forests using satellite data was developed. One journal paper is being prepared on this new technique. A concept paper to develop a fuller project was drafted for international organisations.

Self-evaluation:

This project is being conducted smoothly and without any delay. Eighty percent of the objectives that were planned for 2004/2005 have been achieved at this stage. The outstanding objective is the fieldwork to investigate the relationships between carbon and biodiversity in the pilot site, which will be completed from February to June 2005. Although the primary objective of the workshop was achieved, the number of international participants was less than expected, due to little preparation time.

Future directions and follow-up work:

The relationships between carbon and biodiversity will be clarified in the field, and we will propose a mechanism to meet the cost of ecosystem management by December 2005. Guidelines will be suggested to mitigate the conflicts of the CBD and the Kyoto Protocol by March 2006, and they will be distributed as publication products through DIWPA, DIVERSITAS, and other international organisations.

**Integrated Regional Studies of Global Change in Monsoon
Asia Phase I: APN/SCOPE/START Rapid Assessment Project
of Global Change in Monsoon Asia (APN 2004-14-NMY)**

Project Leader:

Dr. A. SNIDVONGS

Southeast Asia START Regional Centre (SEA START RC)

SWU Pathumwan 5 Building, 5th Floor

Henri Dunant Road

Bangkok 10330

THAILAND

Tel: +66-2-218-9464

Fax: +66-2-251-9416

Email: anond@start.or.th

Integrated Regional Studies of Global Change in Monsoon Asia

Phase I: APN/SCOPE/START Rapid Assessment Project of Global Change in Monsoon Asia (APN 2004-14-NMY)

APN Funding:

Year 1: (APN 2004-14-NMY) US\$ 45,000

Participating countries:

Participants from the following countries were partially or fully funded by this APN grant: Australia, China, Japan, Mongolia, the Russian Federation, Republic of Korea, Thailand, and the USA. Participants in the Southeast Asia Rapid Assessment Project Coordinators meeting from the following countries will be funded by this APN grant: China, Indonesia, Malaysia, Philippines, and Thailand.

Abstract:

Monsoon Asia has been identified by the ESSP (IGBP, IHDP, WCRP and DIVERSITAS) as a priority region for integrated research studies. Changes to the regional climate, biogeochemical, and terrestrial and marine ecosystem functioning, brought about by human driving forces such as increase in population, intensified land use, urbanisation, industrialisation, and economic development, may have global as well as regional consequences. Similarly, effects of global change will have a significant impact on sustainable development at both regional and national levels. Together with the ESSP, START and its regional networks in East Asia, South Asia and Southeast Asia will undertake integrated regional studies of global change in Monsoon Asia. The integrated regional studies will be preceded by a first phase of three sub-regional Rapid Assessment Projects for China/East Asia, South Asia and Southeast Asia. The first phase will systematically review current knowledge regarding regional aspects of global change in Monsoon Asia. A series of book volumes, primarily authored by regional scientists, will be produced within one year of each project workshop.

Activities conducted:

The East Asia Rapid Assessment Workshop was held 6-8 October 2004 in Hangzhou, China. All chapters submitted were reviewed by independent reviewers, as well as SCOPE assigned editors. Modified versions of most chapters have been received and final editorial work is in progress. A synthesis section and forward of the book volume are in early draft form. The Southeast Asia Rapid Assessment Project Coordinators meeting is scheduled for April 2005. A similar meeting of coordinators for the South Asia Rapid Assessment is also planned for the same time.

Outcomes:

Three books summarising current knowledge on regional aspects of global change in Monsoon Asia, identifying gaps in knowledge, and priorities for new research are underway. The first of the three books, "Changes in the Coupled Human-Monsoon System of East Asia in the Context of Global Change", has been drafted and is currently under review. Publication is expected in October 2005. The Second book, "Global Environmental Change and the Southeast Asian Region: an Assessment of the State of the Science", is in the planning stage. The final book on the South Asia Rapid Assessment is also in the planning stage; author identification is underway and many authors have been identified.

The ultimate outcome of this project will be a conceptual framework, which will serve as the basis for a science plan for follow-up studies in each sub-region of Monsoon Asia, and the establishment of an international network of scientists engaged in integrated regional analysis of regional environmental change, and the implications for sustainable regional development.

Product outputs:

The first RAP sub-regional workshop for the East Asia region was held 6-8 October in Hangzhou, China. This workshop brought together key scientists engaged in ongoing research on East Asia, including representatives from START's program sponsors, SCOPE and the APN. Products from this meeting include a refined conceptual framework for sub-regional or national-level studies and the publication of the first of the three rapid assessment books for East Asia, "Changes in the Coupled Human-Monsoon system of East Asia in the Context of Global Change." We intend to finalise all material by early March 2005 and submit the manuscript to the publishers Island Press, by mid-March 2005. We anticipate publication of this volume by July 2005.

Self evaluation:

The effort is progressing well. Some delay in organising the final synthesis workshops has occurred due to the deliberate pace of revisions by chapter authors. Overall the project is proceeding as per original objectives.

Future directions and follow-up work:

Initial meetings of the lead coordinators of the Southeast and South Asia RAPs are scheduled from 2-7 April 2005, preceding the APN 10th IGM/SPG meeting. During these meetings, early drafts of extended abstracts will be reviewed. Individual authors will then finalise their chapters. These will be independently reviewed by August 2005. Final synthesis workshops for both sub-regional RAPs will be scheduled for the last quarter of 2005. The main outputs of these workshops will be the second and third rapid assessment volumes for South and Southeast Asia, which will likely be published by mid-2006.

Follow-up activities include:

- Discussion at the upcoming START SSC on MAIRS and the RAPs and on the development of a research strategy. The research strategy is for a coordinated program of studies in Asia that would include new research activity based on the results of the RAPs; focused research in at least three major river delta regions, including the Yangtze, Mekong, and Ganges are being considered;
- Publications in peer-reviewed scientific journals; and
- Engagement of policy-makers in science-policy dialogues that underline the relationship between global change processes and their implications for regional/national development.



**Fourth International Human Dimensions Workshop -
Globalisation and Food Systems: A Global Environmental
Change Perspective (APN 2004-15-NSY)**

Project Leader:

Prof. J. XU

Department of Ethno botany
Kunming Institute of Botany
The Chinese Academy of Sciences
Kunming, Yunnan 650204

P. R. CHINA

Tel.: +86-871-5150-660

Fax: +86-871-5150-227

Email: CBIK@public.km.yn.cn

Fourth International Human Dimensions Workshop - Globalisation and Food Systems: A Global Environmental Change Perspective (APN 2004-15-NSY)

APN funding:

US\$ 15.000

Participating countries:

Participants from the following countries were funded by the APN grant: China, India, Philippines, Sri Lanka, and Viet Nam. The Institute was co-sponsored by IHDP, IAI, UNA-CEMEDE (Universidad Nacional Costa Rica, Centro Mesoamericano de Desarrollo Sostenible del Tropico Seco), Global Change System for Analysis, Research and Training (START), International Institute for Applied Systems of Analysis (IIASA), National Science Foundation (NSF), International Food Policy Research Institute (IFPRI) and the International Foundation for Science (IFS).

Abstract:

The 4th International Human Dimensions Workshop (IHDW), formally called the “IHDP-IAI Global Environmental Change Institute on Globalisation and Food Systems, Scientific Workshop and Science-Policy Forum” took place from 24 October to 6 November 2004, in Costa Rica. This was the first time that IHDP had organised a capacity-building event in close collaboration with a regional agency, and with a less developed country. During the two-week workshop, participants were introduced to general concepts of global environmental change, globalisation and food systems. The Institute concluded with a Science-Policy Forum at which, in addition to the participants of the workshop, representatives from the regional science and policy community participated. The Science Policy Forum directed its discussions to specific problems of Food Systems in Central America.

Activities conducted:

Representatives from the IHDP core projects and the Food Systems project were invited to present their projects through the Food Systems and Globalisation “lens.” During the workshop, participants worked together in small “working groups” to address specific questions that surfaced due to diverse perspectives, regional and disciplinary perspective. The discussion concerning potential research proposals was accompanied by presentations given by representatives from funding agencies. The presentations concentrated on necessary criteria for writing successful proposals. During the second week of the workshop, participants had the opportunity to work in interdisciplinary groups on potential project proposals.

Outcomes:

The workshop was not only successful in establishing strong links between the participants, but also between the participants and the speakers. This was achieved due to the hands on nature of the workshop. During the workshop, the possibilities of how to get involved with the extensive IHDP community and its core projects were highlighted.

Product outputs:

Concrete follow-up to the workshop will be an edition of the IHDP Newsletter with contributions from the workshop participants and speakers, and a workshop report. There will also be a book on the Science-Policy Forum, both in English and Spanish. All publications will be released in 2005. The workshop's homepage (www.institutes.iai.int) provides information on the workshop and its outcomes. The participants were encouraged to submit panels to the Open Forum. Two sessions submitted by participants funded through the APN have been accepted, Suruchi Bhadwal and Lilibeth Acosta-Michlik. Moreover, they were further encouraged to apply for the pre-Open Forum training seminar on "Understanding Vulnerability and Resilience" and to continue efforts in their "working groups."

Self-evaluation:

The organisers of the workshop were able to identify high level participants. The workshop was very successful in generating enthusiasm and interest in human dimension themes and IHDP projects. The future will reveal whether the participants were able to integrate the knowledge and networks, which were attained at the workshop, into their own work. It will be valuable to offer future opportunities for further involvement with the GEC community.

Future directions and follow-up work:

The participants will continue to work together in the coming months with an aim to submit a proposal to the Annual Regional Call for Proposals. This goal had already been identified prior to the workshop. The lecturers will assist them in the final preparation of the proposals. Planning for the next capacity-building workshop has already started. IHDP has approached the APN to ask whether they would be willing to act as a co-organiser of the IHDW 2006, to take place in Asia.

**Groundwater Discharge as an Important Land-sea Pathway
in Southeast Asia (APN 2004-16-NSY)**

Project Leader:

Dr. M. TANIGUCHI

Research Institute for Humanity and Nature (RIHN)

335 Takashima-cho, Kamigyo-ku

Kyoto 602-0878

JAPAN

Tel: +81-75-2296-193

Fax: +81-75-2296-150

Email: makoto@chikyu.ac.jp

Groundwater Discharge as an Important Land-sea Pathway in Southeast Asia (APN 2004-16-NSY)

APN funding:

US\$ 45,000

Participating countries:

Participants from the following countries were funded: Japan, Philippines, the Russian Federation, Thailand, and the USA. Additional support for Japanese participants was provided by the Research Institute for Humanity and Nature (RIHN). The participants from the USA had additional support from the National Science Foundation and Florida State University.

Abstract:

A field expedition to determine the extent and patterns of Submarine Groundwater Discharge (SGD) in Manila Bay, Philippines, was held in January 2005. Six APN project members and another eight scientists and students, from associated institutes, joined the expedition. Detailed assessments of SGD into the southwest area of the bay, employing several new methodologies and technologies, were performed. Temporal and spatial changes in SGD rate, nutrient and water quality parameters of the SGD, natural radon and radium tracers, resistivity of the coastal sub-surface water, and conductivity and temperature anomalies of sea water were determined. Our results showed that the average SGD rate ranged from 10-20 cm/day in the study area. The resistivity showed that the seawater-freshwater interface and freshwater component of SGD changed during the tidal cycle. An international workshop on SGD, with APN project members and scientists from Southeast Asia, was held in Thailand during February 2005 to discuss future SGD research on the Asian coast and research collaborations.

Activities conducted:

A field expedition to assess Submarine Groundwater Discharge (SGD) was held in Manila Bay, Philippines from 7-11 January 2005. Six APN project members and another eight scientists and students, from project members' institutes joined the expedition. Detailed assessments of SGD into the southwest area of the bay, employing several new methodologies and technologies developed by the project members over the past few years, were performed.

The following measurements were performed during the field experiment:

- Seepage meter measurements were taken using four automated and twelve manual seepage meters. SGD rates were measured every 10 minutes via these automated instruments;
- Groundwater hydraulic gradients were evaluated from water levels measured from monitor wells on land in the study area;
- Nutrients (nitrate, phosphate, etc.) and other water quality measurements were taken from groundwater and seawater;
- Resistivity measurements were taken to estimate the conductivity of the subsurface waters near the coast for evaluation of the freshwater-seawater interface;

- CTD (conductivity, temperature, and depth) profiles were made in Manila Bay in order to describe the water structure;
- Natural radon measurements were taken to measure isotopic inventories of the coastal waters. Continuous measurements of radon inventories in coastal waters were taken every ten minutes using an automated radon monitoring system; and
- Samples of radium isotopic measurements were collected using "Mn fibers" for pre-concentration. These samples are now being analysed by delayed coincidence and gamma counting at Florida State University.

An international workshop on SGD, which included APN project 2004-16-NSY members and scientists from Southeast Asia, convened in Thailand in February 2005. The following is a summary of the workshop agenda:

- Introduction to SGD: characteristics, fluxes, and a review of SGD studies, isotopic methods for assessment of SGD, and coastal zone management implications of SGD in Florida (Gulf of Mexico coast, Florida Keys, Biscayne Bay) and Japan (Suruga Bay, Osaka Bay, Shiranui Bay, and Inland Asian seas);
- SGD studies in Asia, with examples from Chinese-Taipei, the Republic of Korea, Philippines, and Thailand;
- Coastal zones in Southeast Asia and potential SGD study sites in Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Thailand, and Viet Nam; and
- Discussions about new projects and future research plans and input for the final APN report.

The following activities are currently in progress: data interpretations of the temporal and spatial variations in SGD rates; the nutrient and other water quality parameters of SGD; natural radon and radium tracers; resistivity of the coastal subsurface water; and conductivity and temperature anomalies of sea water. Preliminary results indicate that the average SGD rate ranges from 10 to 20 cm/day, in the study area. Furthermore, the seawater-freshwater interface and the freshwater component of SGD changes with tidal stages. These results are consistent with those from other similar coastal locations. We also plan to model: 1) coastal typology; 2) characterisation of aquifer parameters; and 3) groundwater flow in the study area. The models for SGD will be established in the near future.

Outcomes:

The project outcomes for the fieldwork in the Philippines met the original project objectives i.e., preliminary measurements were made and several country scientists and students were trained on the methodologies for assessment of SGD.

Product outputs:

Since the fieldwork was just completed, there are no specific outputs, as yet, although we did provide training for several Filipino scientists and students, and a future project output, in the form of a scientific paper to an international journal is planned.

Self-evaluation:

The project participants felt that the work in the Philippines was well planned and executed. The scientists from the University of the Philippines provided a higher level of support than what was necessary.

Future directions and follow-up work:

Building on the foundations of the international workshop on submarine groundwater discharge and its coastal management implications, APN project members and scientists from Southeast Asia have highlighted what is known about SGD in Asian coastal seas and are planning future collaborative research.

**Climate Variability and Human Activities in Relation to
Northeast Asian Land-ocean Interactions and their
Implications for Coastal Zone Management
(APN 2004-18-NMY)**

Project Leader:

Prof. V. L. KASYANOV

Director

Institute of Marine Biology

Far East Branch of the Russian Academy of Sciences

Palchevsky Street 17

Vladivostok 690041

RUSSIA

Tel: +7-4232-310-905

Fax: +7-4232-310-900

Email: inmarbio@mail.primorye.ru

Climate Variability and Human Activities in Relation to Northeast Asian Land-ocean Interactions and their Implications for Coastal Zone Management (APN 2004-18-NMY)

APN funding:

Year 1: (APN 2004-18-NMY) US\$ 60,000

Participating countries:

Participants from the following countries were funded: China, the Republic of Korea, and the Russian Federation.

Abstract:

The main objectives of the project are as follows: to identify estuarine and coastal changes in Northeastern Asian region, with special reference to the Amur, Tumen and Razdolnaya Rivers; to evaluate the sensitivity of regional changes in relation to anthropogenic processes and climate change; and to provide recommendations to the management of sustainable coastal development of the region. In order to achieve these goals, the literature review and analysis of the existing data were undertaken in comparison with major Korean (Han River) and Chinese (Yangtze, Yellow and Pearl Rivers) rivers, by a team of experts from the countries above. The workshop for the data exchange and discussion of the plan of the forthcoming monograph was held in Nanjing University, Nanjing, China. A website of the project was created (<http://www.imb.dvo.ru/misc/apn/index.htm>) and it contains information about current activities, publications of the participants, reports on previous research, and proceedings of the workshops.

Activities conducted:

One of the main activities was collection, compilation and collation of the existing datasets and literature reviews on the changes in coastal and near-estuarine areas which included the following topics:

- Climatic tendencies in Northeast Asia and Northwest Pacific;
- Climatic changes and river discharges;
- Seasonal and annual variability of the concentration and output of nutrients by the Razdolnaya (Suyfun) River (Russian Federation);
- Concentration of metals in the rivers of the southern part of the Russian Far East;
- The state of coastal ecosystems in near-estuarine areas of Razdolnaya (Suyfun) River (Russian Federation), and
- Long-term changes in the hydrological regime of the Amur River.

The workshop, "Climate Variability and Human Activities in Relation to Northeast Asian Land-ocean Interactions and Their Implications for Coastal Zone Management," was held 4-9 December 2004 in Nanjing University, Nanjing, China, (Co-organisers, Prof. Shu Gao and Dr. Konstantin A. Lutaenko). The main themes discussed during the workshop were: Good aquaculture practice for sustainable coastal management; Nature management within the Russian Far East coastal zones; Study of the state of coastal

ecosystems in the near-estuarine area of Razdolnaya River: comparative analysis of the data of 1980s, 1990s and 2000s; Environment management strategy for Han River estuary in the Republic of Korea; long-term changes in the hydrological regime of the Amur River; the impact of climate variability and human activities on flood and drought disaster in the Yangtze Valley; change in Changjiang suspended load after completion of the Three-Gorges Dam and its impacts on the delta evolution; the changes of sediment concentration; and discharge in the past five years from the Pearl River to the Pearl River Delta. The workshop was jointly held with a business meeting to discuss the science plan and implementation strategy structure of the project, and field excursion to the apex areas of the Changjiang (Yangtze) River delta.

Outcomes:

Some of the important outcomes of the first year of the project were the collection and exchange of data, strengthening of linkages between experts from the three aforementioned countries, and the creation of the website and development of the detailed plan of the future monograph (ten chapters, including Climate variability, Human activities, River runoff, Changes in physical environment of the coast, Material cycling pattern, Ecosystem characteristics, Inter-comparison, Implications on CZM, and Knowledge gaps).

Product outputs:

A book, "Proceedings of the Workshop Climate Variability and Human Activities in Relation to Northeast Asian Land-ocean Interactions and Their Implications for Coastal Zone Management, Nanjing," China, 4-8 December, 2004 (Nanjing: Nanjing Univ., 2004. 157 pp. was published. The proceedings include 30, full-length papers and extended abstracts by Russian, Chinese and Korean experts dealing with different aspects of climatic and environmental changes in coastal areas of China, the Republic of Korea and the Russian Federation. Eight papers were submitted to both national and international journals. A common internet site was created (<http://www.imb.dvo.ru/misc/apn/index.htm>).

Self-evaluation:

The goals of the proposal for 2004 to the beginning of 2005 were fulfilled.

Future directions and follow-up work:

An international training course for young scientists from China, the Republic of Korea, and the Russian Federation will be held in Vladivostok. A wide range of scientists and experts will be involved and a brochure dealing with practical recommendations for policy/decision makers will be prepared and published in several languages. Field surveys in the estuarine areas of Razdolnaya and Amur Rivers will be organised to identify pollution levels and river delta community changes. A workshop/seminar for finalising the draft of the monograph and disseminating the research findings among scientists and policy-makers will be held in the Republic of Korea. The monograph will be one of the main outcomes of the project.

APN Liaison Officer Report for Southeast Asia

Liaison Officer:

Dr. Anond SNIDVONGS


Southeast Asia START Global Change Regional Center
Room 508, 5th Floor, Old SWU Pathumwan Building Number 5
Chulalongkorn University
Henri Dunant Road, Bangkok, 10330, Thailand
Tel: +66-2-218-9464 to 7
Fax: +66-2-251-9416
Email: apnsea@start.or.th

APN Liaison Officer Report for Southeast Asia

- **Overview of work carried out on behalf of the APN:**

1. During 2004/2005, the Liaison Officer (hereinafter referred to as LO) submitted a total of 17 reports in all 4 issues of the APN Newsletter: Vol.10, No.2-4, and Vol.11, No. 1.
2. The LO attended seven conferences and workshops in the region, on behalf of the APN. Some of the major workshops and conferences were:
 - a. CAPaBLE 2003-CB01, in Lao PDR and Thailand; CAPaBLE CRP Theme II, in Patumthani, Thailand.
 - b. The Dialogue: Climate-Sustainable Development – Society: Implications and Response, in Bangkok, Thailand.
 - c. The ESCAP Subcommittee on Environment and Sustainable Development First Session, in Bangkok, Thailand.
 - d. The Second AIACC Regional Workshop for Asia and the Pacific, in Manila, Philippines.


- **Overview of Regional Activities:**

During 2004/2005, there were a number of regional and international activities global change organised in the Southeast Asia Region. 

1. One of the major activities on climate change impacts and climate variability was the CAPaBLE CB-01 project on ‘Building Capacity of Mekong River Countries to Assess Impacts from Climate Change - Case Study Approach on Assessment of Community Vulnerability and Adaptation to Impact of Climate Change on Water Resources and Food Production,’ which was jointly funded by the APN and the AIACC. The objective of this project was to study the regional climate scenarios and impacts of climate change of food products and water resources. Workshops and training sessions on theoretical foundations and computer models and techniques were organised with the objective to build human resources capacity in Lao PDR, Thailand, and Viet Nam, as well as to develop networks at local, national, and regional levels. Following the workshops, research studies were carried out in four selected pilot sites within the lower Mae Kong catchments, comprising the three countries. The project was concluded during the regional synthesis workshops, which delivered impressive results on capacity building and collaboration networks of scientific communities, within the region. Additionally, public awareness was raised through public media in Lao PDR and Thailand; with emphasis on the importance of climate change to the livelihood and social-economic development of countries in the region.
2. Besides this integrated comprehensive regional program, there were other activities such as:
 - a. The 5th APN workshop on indices and indications for monitoring trends in climate extremes in Melbourne, Australia.

- b. The CAPaBLE CRP Theme II workshop on integrated assessment models for developing countries: assessing sustainable development of greenhouse gas mitigation opportunities in Patumthani, Thailand
- c. The 2nd AIACC regional workshop for Asia and the Pacific in Manila, Philippines Dialogue: climate-sustainable development-society: implications and response in Bangkok, Thailand.

Policy-makers, scientists, from countries in the region, and international representatives participated in these activities.

3. Major activities organised under the theme of coastal zones and marine systems include the 5th International Conference on Asian Marine Geology, and the 1st Annual meeting of IGCP475 DeltaMAP project and the APN Mega-Delta project in Bangkok and Ayudhaya, Thailand; and the 2nd SEAGOOS Consultative Meeting Interim Working Group (IWG) in Hangzhou, China. During the 1st Annual meeting of IGCP475 DeltaMAP and the APN Mega-Deltas, scientists were given the opportunity to exchange ideas on and discuss the mega-deltas in the Asia Region. During the second quarter of fiscal 2004, there was an initiative to set-up a Southeast Asia Global Ocean Observing System (SEAGOOS). The terms of reference was drafted by Dr. Liew Soo Chin. This activity was part of an initiative of IOC and will be funded by the EU.
4. There was also an activity on integrated assessment under the topic of Monsoon Asia Integrated Regional Study (MAIRS) where SARCS members and local experts discussed integrated regional studies on the Rapid Assessment Project (RAP) for Southeast Asia. Currently, chapter outlines, a list of contributors and author review literature are being developed. This MAIRS study is also supported by the APN.
5. Two governmental and non-governmental policy relevant activities, which addressed the topic of sustainable development, were organised within the region. The ESCAP subcommittee on environmental and sustainable development 1st session in Bangkok, Thailand and, the 3rd IUCN world conservation congress in Bangkok, Thailand. During the 1st session of ESCAP, conference policy-makers at national, regional and global levels participated and addressed the promotion of sustainable development in Asia and the Pacific. Almost 1,000 of the world's leading scientists and over 200 business representatives attended the IUCN conference.
6. A major global event – the 10th ASEAN Summit was organised in Vientiane, Lao PDR. During the session, ASEAN leaders addressed issues on environmental and natural resource protection and sustainable development.
7. On 26th December 2004, an underwater earthquake, off the Coast of Indonesia, triggered the Tsunami that took the lives of over 156,000 people and affected the livelihoods of over 5 million people throughout the following 11 countries: Indonesia, Sri Lanka, India, Thailand, Malaysia, Maldives, Burma, Somalia, Bangladesh, Kenya and Tanzania. The catastrophe attracted attention from countries in the region on disaster management and relief operations which led to building regional collaboration.  far the APN's role in this area within the region is still

limited. It is suggested that the APN increases its role in developing awareness of disaster management and mitigation at national and regional levels. It should, however, be noted that the APN organised and convened a joint public forum, with the WHO, on 'climate calamities and human health' at the recent World Disaster Reduction Conference in Kobe in January 2005. A follow-up activity is currently being developed and will be presented, for approval, at the APN's 10th Inter-Governmental Meeting in Kobe in April 2005.

Workshops and Meetings

19-21 April 2004. The 2nd SEAGOOS Consultative Meeting Interim Working Group (IWG). Hangzhou, China

Nearly twenty scientists and administrators from Southeast Asian countries and China met during the 6th IOC/WESTPAC International Scientific Symposium to further discuss the Terms of Reference (hereinafter referred to as ToR) for the Southeast Asia Global Ocean Observing System (SEAGOOS). The ToR was drafted by Dr. Liew Soo Chin, National University of Singapore, based on the agreement made during the 1st Consultative Meeting in Kuala Lumpur, in October 2003. During the 2nd Consultative Meeting, experts discussed how SEAGOOS would operate under the framework of IOC/WESTPAC and suggested that modifications be made to the drafted ToR.

7-8 June 2004. SARCS Meeting and MAIRS SEA-RAP Initial Planning Meeting. Chung-Li, Chinese-Taiwan

The annual meeting of the Southeast Asia Regional Committee for START (SARCS) was held at and sponsored by the National Central University in Chung-Li, Chinese-Taiwan; it was hosted by the Secretariat Office. Participants of the meeting included committee members from eight Southeast Asian countries, local guests and Hassan Virji, Deputy Director of the International START Secretariat. During the meeting, the committee reviewed and discussed past regional activities carried out by the SARCS Secretariat, SEA START RC and SARCS Science Coordinator. In addition, the leaders of five regional projects, strongly related to SARCS, gave updates on the progress of their projects. Potentially new regional activities were also discussed and coordinators for each activity were assigned. The coordinators role is to develop proposals which are to be submitted to appropriate funding agencies, such as the APN.

In conjunction with the SARCS meeting, SARCS members and local experts also discussed and agreed on the outline of sections and chapters of the Rapid Assessment Project (RAP) for Southeast Asia. This will be an important step towards the research framework of the Monsoon Asia Intergrated Regional Study (MAIRS). The APN allocated funds to provide partial support to the MAIRS RAP in Southeast Asia.

29-30 July 2004. APN CAPaBLE CB-01 Synthesis Workshop on the Study of Climate Change Impacts on Water Resources and Rain-fed Agriculture Production. Vientiane, Lao PDR

This synthesis workshop marked the conclusion of the first phase of the APN CAPaBLE CB-01 Project, "Building Capacity of Mekong River Countries to Assess Impacts from Climate Change: Case Study Approach on Assessment of Community Vulnerability and Adaptation to Impact of Climate Change on Water Resources and

Food Production”. From January 2004, a series of training workshops, pilot research studies, using the tools and real data of studied areas in Lao PDR, Thailand and Viet Nam, conferences and capacity building activities, were arranged.

This workshop was organised by the APN LIAISON OFFICE/SEA START RC and locally hosted by the Science, Technology, and Environment Agency (STEA) of Lao PDR. The main objective of the project was capacity building. Capacity building not only initiated the establishment of scientific capacity for Laos, Thai, and Vietnamese scientists on the assessment methodology for the impact of climate change, but also through the projects, it aided in the development of a collaborative network of scientific communities for future cooperation on the study of climate change impacts, at the regional scale.

Mr. Sakhone Chaleunvong, Vice-Chair of STEA gave the opening address at the workshop. The following key people on climate change in the region presented and made comments during the workshop: an IPCC Working Group I vice chair and Bureau member, Dr. Kansri Boonpragob, an official Representative of Thailand and representative of the APN national Focal Point, Dr. Asdaporn Krairapanond, the APN SPG member from Lao PDR, Mr. Chanthanet Boualapha, and, the APN SPG member from Thailand, Dr. Jariya Boonjawat. Prior to the main workshop, an information assembly for project team members and the media from Lao PDR and Thailand was organised. The purpose of this information assembly was to establish community awareness on the importance of climate change to the livelihood and social-economic development of countries in the region.

Participants of the workshop included 22 scientists from Lao PDR, Thailand and Viet Nam; they represented over ten government agencies, national research institutes, and universities. participants presented their research findings from selected sites since the two earlier training workshops on theoretical foundations and computer modeling applications in the assessment of climate change impacts, especially on water resources and the agriculture sector. The regional outcomes of the impacts of future climate change on the two sectors were compiled from pilot site studies and synthesised by respective focus group leaders, Drs. Anond Snidvongs and Attachai Jintrawet.

The research outcomes and capacity gained by the scientists that participated in the CAPaBLE CB-01 were very impressive. Participants and policy-makers from the workshop are looking forward to Phase 2 of this APN CAPaBLE project which will cover the human dimensions of vulnerability and adaptation to climate change. Studies will also include the assessment of human and institutional adaptive capacity and policy analysis for appropriate strategic development in order to manage the future impact of climate change as part of the sustainable development process.

9-10 August 2004. CAPaBLE CRP Theme II Workshop on Integrated Assessment Models for Developing Countries: Assessing Sustainable Development and Greenhouse Gas Mitigation Opportunities. Pathumthani, Thailand

The objective of this CAPaBLE workshop, led by Professor P. R. Shukla of the Indian Institute of Management, was to make researchers and policy-makers in Asia aware of the efforts of using Integrated Assessment Models for policy analysis on sustainable

development, in developing countries. Participants of the workshop included approximately 25 policy-makers and senior technical experts from Bangladesh, India, Indonesia, Japan, Philippines, Sri Lanka, Thailand, and Viet Nam, as well as the United Nations and other international agencies. During the workshop, there was detailed discussion on the integrated assessment models and their applications, and on the state-of-the-art environmental innovations and strategies for sustainable development. Since the topic of greenhouse gas emissions is quite a sensitive issue among countries in the region, a recommendation was made to increase communications between the countries concerned. This should not only be at the national Focal Point level but also with academics, agencies and civil society as well. To facilitate this, it was proposed that the APN, as a global change research network, could potentially be a mechanism for such communications.

19 August 2004. Dialogue: Climate—Sustainable Development—Society: Implications and Response. Bangkok, Thailand

The Dialogue was an event of the 5th Princess Chulabhorn International Science Congress held during 16-20 August 2004. It was co-hosted by the following organisations: the International Research Institute for Climate Prediction, IRI, Columbia University; the United Nations Environment Programme; the Global Environment Action, GEA, Japan; and the Thailand Environmental Institute (TEI). This event was organised under the patronage of Professor Dr. H.R.H. Princess Chulabhorn to honor the 72nd Birthday of Her Majesty Queen Sirikit of Thailand. This event was participated by approximately 60 senior level participants from government agencies, business corporations, and academic and research institutes. Participating institutes included: H.E. Suwit Khunkitti, Minister of Natural Resources and Environment, Thailand, Professor Nay Htun, Former UN Assistant Secretary General, Professor Michael McElroy, Chair IRI Board of Overseers, Hon. Kazuo Aichi, Director General Global Environmental Action and former Minister of the Environment Agency of Japan, Mr. Kazuhiko Takemoto, Deputy Director General, Ministry of the Environment, Japan/APN national Focal Point, and, Dr. Tariq Banuri, Director Stockholm Environment Institute Asia. The Dialogue addressed the impacts of climate variation on health, agriculture, food security, and water resources. Topics for discussion during the event included: measurement and monitoring of climate variation and change, climate effects on human health, agriculture and food security: the role of climate variation and change, climate and water, and a round table discussion on potential opportunities for collaboration to increase knowledge for response options. Participants also examined and discussed the opportunities to increase protection and improvement of the health and well-being of people, enhance food security, manage water resources, and review the state of scientific knowledge to support policies to promote sustainable development.

29 September–1 October 2004. ESCAP Subcommittee on Environment and Sustainable Development First Session. Bangkok, Thailand

International organisations, United Nations bodies and specialised agencies, and 26 UN member countries throughout Asia and Australia participated in the 1st Session of ESCAP Subcommittee on Environment and Sustainable Development, in Bangkok. During the session, the APN was represented by Dr. Jariya Boonjawat, SPG member for Thailand, and Dr. Anond Snidvongs, Liaison Officer for SEA. Three key themes,

covering the multi-stakeholder partnerships in promoting sustainable development in Asia and the Pacific, were addressed. These key themes were: 1) energy services for sustainable development in rural areas, 2) water resources management for sustainable development and, 3) prevention and control of dust and sandstorms.


There was also discussion on the possibility of support from the APN and partnership with UNESCAP regarding the sustainable development of the Asia-Pacific region. In particular, the theme of dust and sand storms, which is linked with two research priorities of the APN; changes in atmospheric composition and changes in terrestrial ecosystems. Hence, UNESCAP will communicate with the APN members to discuss the opportunities of future cooperation.

The plan for the next ministerial conference on environmental and development in Asia and the Pacific, which will convene in March 2005 in Seoul, Republic of Korea, was also discussed. The APN will co-sponsor and organise, along with ESCAP and IGBP, the eminent scientists' symposium on global change, environment and development.

2-5 November 2004. The 2nd AIACC Regional Workshop for Asia and the Pacific. Manila, Philippines

The Environmental Forestry Programme at the University of Philippines hosted the 1st workshop in March 2003, in Bangkok, Thailand. The 2nd Regional Workshop on UNEP/START/TWAS projects under the 'Assessments of Impacts and Adaptations to Climate Change (AIACC)' global initiative for Asia and the Pacific followed the 1st workshop. The AIACC granted eight regional pilot studies on climate change and its vulnerability and adaptation, during the past year. These pilot studies involved eight countries, in addition to the eight Small Island States, in the Asia-Pacific Region.

The meeting and workshop covered topics such as: Climate Change Assessments and Capacity Building in Asia and the Pacific Islands, the National Communications to the UNFCCC, the Stakeholder Engagement and Linking to Decision-Making, the Vulnerable Island and Coastal Communities, the Vulnerable Deltas and Watersheds, the Adaptation Opportunities and Capacities, the Vulnerable Production Systems, the Assessments and Adaptation Needs and Opportunities and Climate Variability, and Changes and Scenarios. During the four-day workshop, 98 participants from 20 countries, around the world, discussed their findings and developed the next step in responding to climate variation and its vulnerability. As well, the development of the Phase II of the AIACC project, which, for some countries, included national communications to the UNFCCC, was also discussed. In addition, several issues from their projects and the usage of climate modelling, particularly the GCM Models were presented.

During the workshop, Dr. Anond Snidvongs, as Liaison Officer for Southeast Asia, represented the APN, and also gave a presentation on 'Climate Means and Climate Variability Scenarios for Mainland Southeast Asia for Impact and Vulnerability Assessments'.  studies of which had been carried out by SEA START RC on future climate scenarios for mainland Southeast Asia.

17-25 November 2004. The 3rd IUCN World Conservation Congress. Bangkok, Thailand

Co-hosted by the Government of Thailand and IUCN, the World Conservation Union, the 3rd IUCN World Conservation Congress was held under the theme of 'Peace and Nature: Only One World'. This premier conservation event attracted over 4,900 people from states, government agencies and non-governmental organisations (NGOs) across the globe. Among the 4,900, almost 1,000 of the world's leading scientists, and over 200 business representatives, were also in attendance. The Congress, held every four years, addresses the business of the Union, and functions as a forum for debate on critical environmental issues and provides an opportunity to meet with representatives of IUCN members and environmental organisations working around the world.


Dr. Richard Cooper, Research Fellow from the SEA START RC and Coordinator of the SEA Regional Learning Center at Chulalongkorn University participated at the three-day World Conservation Forum. This forum addressed critical sustainable development issues under four broad themes including: 1) Ecosystem Management, 2) Health, Poverty and Conservation, 3) Biodiversity Loss and Species Extinction, and 4) Markets, Business and the Environment. There were more than 300 sessions including Global Synthesis Workshops and related workshops and events organised by IUCN members.

The congress presented an opportunity to highlight up-to-date scientific findings regarding the state of the global environment and growing business sector participation. It also recognised people and organisations for environmental excellence. Furthermore, more than 100 resolutions and recommendations, concerning major conservation policies and actions, were adopted at the Congress.

29-30 November 2004. The 10th ASEAN Summit. Vientiane, Lao PDR

During the summit, ASEAN leaders addressed the following issues: the economy and prosperity; security and peace; socio-cultural matters; and humanity. In addition, they agreed to accelerate the integration of 11 priority sectors under the Framework Agreement towards the ASEAN Economic Community (AEC), to be established by 2020. Memoranda and agreements, on comprehensive economic corporations between the Association of Southeast Asian Nations, and, Australia, China, New Zealand, India, Japan, Republic of Korea, and the Russian Federation, were developed.

Environmental and natural resource protection and sustainable development were among the topics under ASEAN Socio-Cultural Community's goals. These have been embedded into the ASEAN Vision 2020, by promoting a culture of science and technology, and enhancing cooperation in the utilisation of appropriate applied science and technology in socio-economic activities to improve social well-being and develop mechanisms for environmental governance. The ASEAN Socio-Cultural Committee's action plan marked ASEAN's commitment to the Johannesburg Plan of Implementation of the World Summit for Sustainable Development (WSSD). It focussed on the following ten priority areas: 1) global environmental issues; 2) land and forest fires and transboundary haze pollution; 3) coastal and marine environment; 4) sustainable forest management; 5) sustainable management of natural parks and protected areas; 6) freshwater resources; 7) public awareness and environmental education; 8) promotion of environmentally sound technologies and cleaner production; 9) urban environmental management and governance; and 10) sustainable monitoring and reporting, and

database harmonisation.  strategic planning included regional and national driven initiatives set up of regional mechanism or standards, strengthen networks and partnerships, community building efforts, promote environmental education, and improve science and technology competence of ASEAN's human resources.

- **Outcomes and Products:**

The following outcomes have resulted from the 2004/2005 activities:

1. Two regional research networks, consisting of climate change scientists, were established for water resources and crop production.
2. Capacity building of human resources, networks, and collaboration at inter-governmental and institutional levels were initiated.
3. Training for scientists on tools and techniques was created to improve their know-how in conducting future research and studies in their respective countries.
4. Experts and scientists in the region will share their research results and studies as knowledge exchange sessions to enhance their capability in their future studies.
5. Development of institutional awareness, the collaborative network of the scientific community, and capacity; and an improvement of communications and coordination activities in the region.

- **Future Activities:**

7-9 April 2005. Meeting of the Southeast Asia Chapter Coordinators of the APN/SCOPE/START Rapid Assessment of Global Change in Monsoon Asia. Chiang Mai, Thailand.

23-27 May 2005. The 6th Session of the WESTPAC Sub-Commission. Nha Trang, Viet Nam.

29 August –1 September 2005. The SCOR Executive Committee Meeting. Cairns, Queensland, Australia.

19-23 September 2005. The 15th International Federation of Agricultural Movements (IFOAM) Congress. Adelaide, Australia.

13–17 November 2005. Greenhouse 2005: Action on Climate Control. Melbourne, Australia.

- Chapter Two -

APN Liaison Officer Regional Reports

APN Liaison Officer Report for Oceania

Liaison Officer:

Ms. Mosmi BHIM

APN Liaison Officer and
Programme Assistant
START-Oceania Secretariat
Pacific Centre for Environment and
Sustainable Development (PACE-SD)
University of the South Pacific (USP)
Suva, Fiji
Tel: +679-3212-926
Fax: +679-3309-176
Email: startoceania@usp.ac.fj
Website: www.usp.ac.fj/start

APN Liaison Officer Report for Oceania

- **Overview of work carried out on behalf of APN:**

1. Submitted, quarterly, regional reports to the APN newsletter.
2. APN activities included in the two editions of the Oceanic Waves newsletter that were published in 2004.
3. Information about the APN was presented at meetings attended by the APN Liaison Officer and the APN SPG member/Director of START-Oceania Secretariat. (Please refer to the list of meetings given below.)
4. APN activities and opportunities were disseminated to our regional network. Many regional contacts have expressed interest in the APN Call for Proposals and it is anticipated that there will be more applications, in 2005.
5. The new START-Oceania website highlights APN activities and provides a link to the APN website.

15-17 March, 2004. Inter-linkages Regional Meeting on Integrated Capacity Development in the Pacific on Multilateral Environmental Agreements. Nadi, Fiji

This meeting was coordinated by the South Pacific Regional Environmental Programme (SPREP), the United Nations University (UNU) and the Ministry of the Environment, Japan. The main goal of the meeting was to develop practical and applicable frameworks of cooperation and activities for possible consideration by Pacific Island Countries on MEA Management, particularly capacity building within the context of National Capacity Self Assessment (NCSA). In working groups and plenaries, the meeting discussed various aspects of MEA compliance, MEA inter-linkages, knowledge management for capacity building and the partnerships required for moving forward. (The Okinawa projects, highlighted later in this report, were also discussed in the meeting.) Dr. Koshy represented the APN at this meeting.

22-24 March, 2004. The 9th APN Inter-Governmental Meeting and Scientific Planning Group Meeting. Canberra, Australia

Dr. Koshy attended this meeting and presented the APN Liaison Officers regional report for Oceania and updated the meeting on the APN CAPaBLE capacity building project 'Climate and Extreme Events in the Pacific,' which was held at USP, Suva, 15-26 June, 2004.

29 March – 2 April, 2004. Institutional Capacity Building on Renewable Energy Training in Pacific Island Developing States (PIDS). Pilot Training on Wind Energy Conversion Systems (WECS). University of the South Pacific, Suva, Fiji

The one-week workshop discussed renewable energy sources and the need for sustainable energy policies. Wind power was a particular focus of the workshop. Participants were introduced to wind resources, factors affecting wind speed, selection of potential sites for wind turbines, modelling techniques, wind generation and components of the wind turbine. In addition, they were introduced to physical, theoretical and technical aspects of Wind Energy Conversion Systems (WECS). Twenty-six participants from the Cook Islands, Fiji, Samoa, Solomon Islands, Tonga and Vanuatu attended the workshop from different energy sectors of governments, non-

government organisations and tertiary institutions. The workshop was facilitated by SOPAC and USP's Department of Physics, organised by USP's Department of Physics and funded by USP and UNESCAP. Ms. Mosmi Bhim attended this meeting.

15-26 June, 2004. (APN CAPaBLE Programme) Pacific Island Training Institute on Climate and Extreme Events

This joint training institute was convened by USP's Pacific Centre for Environment and Sustainable Development (PACE-SD), the East-West Center (EWC), Hawaii, and the National Institute of Water and Atmospheric Research (NIWA), New Zealand, at the USP campus, Suva. The training institute was coordinated by Prof. Koshy, Ms. Eileen O'Shea (EWC) and Dr. Jim Salinger (NIWA). The APN's CAPaBLE programme, and the U.S. National Oceanic and Atmospheric Administration were the major sponsors with additional contributions from USP, EWC and NIWA. Small Islands Developing States (SIDS), such as those in the Pacific region, are considered among the most vulnerable to the consequences of climate variability and change and associated extreme weather events. The training institute is expected to assist in the development of a regional network of scientists, forecasters, disaster management officials and resource managers, skilled in the development and the use of climate information to increase the resilience of Pacific Island nations in the face of climate-related extreme events. The institute was comprised of an intensive programme of lectures, small group discussions, training sessions, in a computer lab, and collaborative research activities. About 35 participants, including resource people, participated in the Training. Mosmi Bhim also participated in this training.

28-30 June 2004. Pacific Regional Stakeholders Planning Workshop

The South Pacific Applied Geoscience Commission (SOPAC) hosted the Regional Stakeholders Planning Workshop to develop a Pacific Regional Strategic Disaster Risk Reduction Action Plan, to assist the Pacific Island region's preparations for the 2nd World Conference on Disaster Reduction which was held in Kobe, Japan, 18-22 January, 2005. To ensure that the interests of the Pacific region were represented in Kobe, over 40 participants representing 16 countries, as well as regional and national organisations, attended the regional planning workshop. The workshop was designed to provide a platform through which participants could contribute ideas towards regional policies that would support disaster risk reduction decision-making; to reduce the vulnerability of the Pacific Small Island Developing States (SIDS) and strengthen their national sustainable development planning. Ms. Mosmi Bhim attended this meeting and gave a presentation on APN and START activities in the region related to the workshop theme.

1-3 July 2004. South Pacific Tsunami Awareness Workshop Forum Secretariat. Suva, Fiji

The workshop was organised by the South Pacific Applied Geoscience Commission (SOPAC), the International Tsunami Information Centre and the Intergovernmental Oceanographic Commission. Following the presentations, group sessions were held to prepare a draft document titled 'Strategic Recommendations for Addressing Tsunami Risks'. SOPAC is expected to consider these recommendations in relation to the development of the Pacific Regional Strategic Action Plan for Disaster Reduction. Presentations were made by experts and country reports were also presented by the National Disaster Management Officers (NDMO), of various countries. At the end of


this workshop, a Draft Strategic Recommendation for Addressing Tsunami Risks was prepared. This draft document set out a framework whereby Pacific countries' capacity could be enhanced to aid tsunami risk identification, preparedness and reduction. Ms. Mosmi Bhim, the APN liaison officer, attended this workshop.

8-10 November 2004. The 2nd APN Global Change Coastal Zone Management Synthesis Workshop. Kobe, Japan

This project is led by Prof. Nick Harvey of the University of Adelaide, Australia. Prof. Harvey is also the Chair of the START-Oceania Regional Committee. Prof. Kanayathu Koshy and Prof. Patrick Nunn also attended, from the University of the South Pacific (USP). The APN Global Change Coastal Zone Synthesis Report will be launched at the 10th APN Inter-Governmental Meeting and Scientific Planning Group Meeting that will convene in Kobe from 12-14 April, 2005. At the above workshop, the group agreed to focus their attention on the production of the Synthesis Report, which is intended to be a summary of APN-funded global change research projects. It was agreed to target a broad audience including policy-makers, APN members, educationalists and the general public. The group agreed on a schedule for the report drafting, review and publication. The proposed outline, geographic coverage, and other issues, were also agreed upon.

- **Overview of Regional Activities:**

26-30 January, 2004. Report on the Inter-regional Preparatory Meeting for the Ten-year Review of the Barbados Programme of Action for the Sustainable Development of Small Island Developing States. Nassau, Bahamas

Over 300 participants, including 13 ambassadors, 22 ministers, deputy ministers, and representatives of UN agencies, and inter-governmental and non-governmental organisations, attended the meeting.  week-long meeting synthesised the regional position papers into an *AOSIS Strategy Paper*, accommodating all aspects of the special issues discussed during panel discussions into the *Nassau Declaration* highlighting SIDS achievements and challenges in the implementation of BPOA. The results of this meeting will be forwarded to the G-77/China for consideration in advance of the New York PrepCom in April 2005.

2-6 February, 2004. Pacific Islands Regional Ocean Forum (PIROF). University of the South Pacific, Suva, Fiji

The PIROF meeting was jointly organised by the University of the South Pacific (USP), the Secretariat of the Pacific Community (SPC) and the South Pacific Applied Geoscience Commission (SOPAC), to examine options and initiatives for the implementation of the Pacific Islands Regional Ocean Policy (PIROP). More than 200 people from 20 Pacific countries participated in PIROF, including senior government officials, diplomats, representatives from environmental departments, international bodies and, regional and non-government organisations. The PIROF participants adopted the Pacific Islands Regional Ocean Policy and reaffirmed their commitment to sustainable ocean development, as expressed in the ocean and coast components of Agenda 21. They also reaffirmed their commitment to the Global Action Plan for Small Island Developing States, agreed to in Barbados, in 1994, and to the Johannesburg Plan of Implementation. PIROF is to be implemented through the development of a

Framework for Integrated Strategic Action (ISA). The PIROF meeting agreed on a process, through which ISA will be finalised.

March, 2004. The Expert Meeting on Project Design for Pacific Islands. Okinawa, Japan

About 35 participants from international/regional organisations (UNESCO-IOC, UNDP, FAO, SPREP), universities (UNU, Hawaii, Hokkaido, Ryukyus, USP), NGOs (WWF, ISME, LEAD Japan), Ministry of Foreign Affairs (MOFA Japan), Okinawa Prefecture and, Okinawa International Centre etc., attended the meeting. Dr. Koshy was also in attendance. The major objective of the meeting was to discuss project design for Pacific Islands in the thematic areas of *environment, health and human resource development*, as a follow-up measure to the 3rd Pacific Islands Forum Meeting (PALM-3) held in Okinawa, May 2003. These project ideas were grouped into two broad thematic areas matching the programmatic approach to sustainable development activities, gaining prominence in the Pacific region.

14-16 April 2004. Preparatory Meeting for the Ten-Year Review of the Barbados Programme of Action (BPOA+10). United Nations Headquarters, New York, USA

Director of the START, Oceania Secretariat, Prof. Kanayathu Koshy was among the delegation which participated in this meeting. Prof. Koshy gave a presentation on 'Capacity Building for Sustainable Development' in one of the side events. Pacific SIDS emphasised that causes beyond their direct control impede full and effective implementation of the BPOA. These included: overall decline in overseas development assistance, decline in commodity prices, loss of preferential trade arrangements, global pressure to reduce the size of the public sector, increase in the cost of imported fossil fuels and, instigation of some donor driven projects that may be inconsistent with the BPOA. On top of this, there was deep concern with regards to the impacts of climate change, climate variability, sea-level rise and extreme weather events as an impediment to sustainable development, and called on countries that had not done so, to ratify the Kyoto Protocol, and urged the international community to support implementation of the Regional Framework for Climate Change, Climate Variability and Sea-Level Rise.

26-27 May, 2004. AIACC Stakeholders Meeting. Suva, Fiji

The meeting, held at the University of the South Pacific, Suva, Fiji, was attended by stakeholders in the AIACC project: Integrated Methods and Models for Assessing Coastal Vulnerability and Adaptation to Climate Change in Pacific Island Countries. It was organised by the Pacific Centre for Environment and Sustainable Development (PACE-SD) and was attended by project implementers, which included representatives of PACE-SD, South Pacific Regional Environment Programme and the International Global Change Institute (IGCI) of the University of Waikato. Health, environment workers and NGOs from Fiji, Cook Islands and Vanuatu, also attended and country reports were presented.

28 June–9 July 2004. National Summit for Sustainable Development. Funafuti, Tuvalu

Prof. Kanayathu Koshy attended this meeting, as a facilitator on behalf of the University of the South Pacific (USP). Representatives from the Forum Secretariat, SOPAC, SPC, SPREP and USP, also participated as facilitators. Since the expiry of the 'Kakeega o

Tuvalu 1995-1998,' Tuvalu has been without an up-to-date set of agreed national development priorities and strategies, or a prioritised public sector investment programme. The NSSD intended to correct this situation and to provide a clear set of national priorities and guidelines, policies and a strategic framework for the future development of Tuvalu over the period 2005-2015. At the summit, plenary sessions were held each day on seven thematic areas. An average of about 250 people, from a broad spectrum of sectors, participated. The plenary sessions were followed by working group discussions. With the exception of two evenings, side events were held on each evening covering a number of cross-cutting themes. Prof. Koshy, together with Mr. John Low, from the Forum Secretariat, and Mr. Bhaskaran Nair, from SOPAC, made a formal presentation during one of these side-events on the theme of 'Capacity Building for Sustainable Development,' placing special emphasis on the development challenges identified during the Summit. A detailed summary matrix, highlighting the key challenges in each of the thematic areas, key policy outputs and key performance indicators, will be one of the major outputs of the Summit. In addition, there will be a National Sustainable Development Framework, containing a 10-year performance based vision.

5-9 July 2004. Pacific Islands Renewable Energy Project Meeting (PIREP). Apia, Samoa

The Pacific Islands Renewable Energy Project (PIREP) meeting was held at the South Pacific Regional Environment Programme (SPREP) office in Apia, Samoa, from 5-9 July, 2004. The week-long meeting was attended by stakeholders from the South Pacific region. The meeting was organised by SPREP, who are implementing the initial preparatory phase of the PIREP project, and funded by the Global Environment Facility (GEF) and the United Nations Development Programme (UNDP). The meeting examined how renewable technologies can better contribute to reducing greenhouse gas emissions. Delegates looked at various fiscal, regulatory, technical, institutional, policy and awareness barriers that Pacific Island Countries need to overcome, if renewable energy is to have a significant impact on reducing fossil fuel consumption, according to PIREP coordinator Mr. Solomone Fifita. A log-frame matrix was drawn up for a multi-million dollar project proposal, to be submitted to GEF later in the year. The proposal is a joint effort by the international, regional and national agencies currently dealing with regional climate change and energy issues.

3-6 August 2004. SIDS Universities Consortium Development Workshop. Virgin Islands, USA

The initial concept of the consortium emerged at the SIDS Ministerial meeting, held in Montego Bay, Jamaica in May, 2002, as part of the preparations for the World Summit on Sustainable Development (WSSD). The Consortium was further developed at an expert meeting organised by the Pacific Centre for Environment and Sustainable Development (PACE-SD) on 'Capacity Building for the Sustainable Development of SIDS' held from 3-8 December 2003 at USP. Consortium partners met again during the Nassau SIDS inter-regional meeting and the PrepCom for BPOA+10 at the UN headquarters, New York. About 22 participants representing UWI, USP, UVI, UoMalta, UoMauritius, NUS, UoH, UoBelize, UoArcadia, UNESCO, UNDP, and UNDESA, including Ambassador Jagdish Koonjul, Chair of AOSIS, attended the meeting. Training areas relevant for the sustainable development of SIDS were identified by the

consortium. A draft MOU will be prepared and the University Heads will hold a mini PrepCom, in November, to finalise details before the Mauritius meeting. Prof. Koshy attended this meeting. Funding for travel and accommodation was provided by UNDP.

31 August 2004. Public Lecture on Climate Change and its Interactions with Tourism in Fiji. University of the South Pacific. Suva, Fiji

Dr. Susanne Becken presented a public lecture on the findings of her research on 'Climate Change and its Interactions with Tourism in Fiji' on 31 August, 2004, at the University of the South Pacific (USP), Suva, Fiji. The findings were from the project 'Climate Change and Tourism in Fiji,' funded by the European Union under the 8th EDF and carried out this year at USP's Department of Tourism and Hospitality. Dr. Becken's research focused on the interactions between climate change and tourism whereby, both tourism's vulnerability to climate change impacts (and possible adaptation measures) and tourism's contribution to climate change (ie greenhouse gas emissions) were considered. The research also explored tourists' perceptions of climate change and their willingness to contribute financially to adaptation or mitigation measures. A final report titled 'Climate Change and Tourism in Fiji—Vulnerability, Adaptation and Mitigation' was published, which has recommendations for tourist industry stakeholders, tourists, government and environment officials. The report details the impact climate change already has on the tourism industry (especially tourism accommodation), amount of energy consumed by the industry, and the mitigation and adaptation measures already in place. This presentation was attended by Prof. Koshy and Mosmi Bhim. Dr. Becken is a researcher at Lincoln University, New Zealand.

31 August 2004. National Waste Forum 1. Suva, Fiji

This one-day event was organised by the Department of Environment of Fiji's Ministry of Local Government Housing, Squatter Settlement and Environment. The main objective of the Forum was to establish the content, direction and responsibilities to be undertaken for the development of a National Waste Management Strategy. A new waste strategy for Fiji is expected to set a direction for developing sustainable waste management practices. The strategy will be produced after widespread consultations and through a process of partnership with the main stakeholders involved in the production and management of waste. Through the Waste Forum and Working Groups, expertise will be drawn from industry, NGOs, academia and specialist bodies.

A second waste forum is expected to be held in Fiji's Western Division in November and a third one is to be held in April 2005 and the fourth one is likely to be held in June, 2005. By June, 2005, a National Waste Management Strategy is expected to be produced. After this, a national waste forum is expected to be held once every year. The first draft of the National Waste Management Strategy for Fiji has been produced by Fiji's Department of Environment and the University of the South Pacific's (USP) Pacific Centre for Environment and Sustainable Development (PACE-SD). Prof. Koshy attended this meeting as a facilitator and as the Director of PACE-SD.

12-14 October 2004. Workshop on Adaptation to Climate Change and the Clean Development Mechanism. Apia, Samoa

This three-day workshop, held at the Training and Education Centre of the South Pacific Regional Environment Programme (SPREP), was jointly organised by the Institute for

Global Environmental Strategies (IGES), Japan and the UNEP Risoe Centre (URC), Denmark. In attendance were experts, policy-makers, and other stakeholders, from the Asia-Pacific region. The workshop received local support from SPREP and additional financial support from the governments of Australia, Japan, and New Zealand. The objectives of the workshop included: 1) identifying adaptation policies and measures and assessing their implementation across a range of sectors and stakeholders, 2) assessing status and identifying opportunities for effective implementation of CDM in the region and, 3) identifying ways for future collaborative actions in facilitating adaptation and Clean Development Mechanism (CDM). CDM is one of the mechanisms of the Kyoto Protocol, to reduce Greenhouse Gas (GHG) emissions. Through CDM, developed countries are able to provide assistance to developing countries to undertake CDM activities, such as planting trees (afforestation and reforestation) and mangroves to absorb carbon dioxide, and renewable energy and energy efficiency projects.

2-5 November 2004. The 2nd AIACC Regional Workshop for Asia and the Pacific. Manila, Philippines

Assessments of Impacts and Adaptations to Climate Change (AIACC) are implemented jointly by START and the Third World Academy of Sciences, on behalf of the United Nations Environment Programme (UNEP). The workshop in Manila was funded by AIACC and locally hosted and organised by the Environmental Forestry Programme of the University of Philippines, which is home of an AIACC regional study. In the South Pacific, the AIACC project is being conducted by the Pacific Centre for Environment and Sustainable Development (PACE-SD) at the University of the South Pacific (USP) in conjunction with the University of Waikato's International Global Change Institute (IGCI) and the South Pacific Regional Environment Programme (SPREP). The South Pacific AIACC study is entitled 'Integrated Methods and Models for Assessing Coastal Vulnerability and Adaptation to Climate Change in Pacific Island Countries'. AIACC implementers from PACE-SD gave presentations on its progress at the Manila meeting.

1-2 December 2004. START-Oceania Regional Committee Meeting. Noumea, New Caledonia

The Institute of Research and Development (IRD) in Noumea, New Caledonia hosted the annual START-Oceania Regional Committee meeting. The past year's activities, including the current and past APN-funded projects, were reviewed and plans for the future were developed. Committee members also met with the Director of IRD, the Director of Meteo-France, the French government representative, and the government of New Caledonia delegate for research. The possibility of research collaboration, through new partnerships, was explored. The committee plans to develop four additional projects in the area of climate change. These include: 1) a project on adapting to climate change, 2) a regional project linking climate change and El Nino, 3) a project on coastal management in Oceania and, 4) a project on the impacts of climate change on communities. Additional projects in other areas that will be developed during the year were identified.

8-9 December, 2004. The 2nd Fiji National Integrated Coastal Management Workshop. University of the South Pacific (USP). Suva, Fiji

This workshop was organised by USP's Institute of Applied Sciences (IAS). The objectives of the workshop were to evaluate the progress of the Integrated Coastal

Management (ICM) project since the 2002 National ICM Workshop, to verify and incorporate lessons learned, to review the national mechanisms for ICM and ICM related initiatives in Fiji and, to recommend priority actions and mechanisms for the continuation of ICM in Fiji. The ICM is a joint project between the Fijian Government, the IAS and the Coastal Resources Center of the University of Rhode Island. The workshop determined that there could be improvement on the strategies for implementation. The following were activities targeted for improvement: 1) training at village/provincial level, 2) disseminating information, 3) improving communications between chiefs and villagers, 4) monitoring of coastal activities using appropriate methods and feedback delivery, 5) increasing media awareness and, 6) creating links to world/national days on environment and water, etc. Through these approaches, it was recommended to establish multi-stakeholder Tikina Committees; to establish and utilise village committees with appropriate representatives and involve women and youth from the outset and in all phases. Activities recommended for the national level include ensuring that the Environment Management Bill integrates with the Fisheries, Health and National Disaster Management Bills. Emphasis was also placed on reporting best practices and lessons learned into the school system. Approaches for national integration and coastal development planning at the local and national levels were also discussed and final overall recommendations and areas of expansion for ICM work was decided upon.

- **Outcomes and Products:**

1. Oceanic Waves, Vol. 6, Issue 1 & 2, 2004.
2. Oceanic Waves, Vol. 6, Issue 3 & 4, 2004.
3. CD for (CAPaBLE Programme) Pacific Island Training Institute on Climate and Extreme Events.
4. Report on (CAPaBLE Programme) Pacific Island Training Institute on Climate and Extreme Events.
5. START-Oceania Secretariat Annual Report 2003-2004.
6. Climate Change Roundtable Matrix of Projects.
7. New START-Oceania Secretariat website (www.usp.ac.fj/start/).

- **Future Activities:**

1. Four issues of the quarterly newsletter Oceanic Waves, to be published over the year.
2. A brochure for the START-Oceania Secretariat giving general information on START-Oceania and the APN liaison network.
3. Liaising, networking, and information dissemination with our regional contacts.
4. Regular updating of our website to raise awareness of new publications and global change related activities and opportunities.
5. Active participation at national and regional meetings to contribute and disseminate information.
6. Following up on APN funded projects and publicise activities.
7. Preparing quarterly reports for the APN.
8. START-Oceania Regional Committee meeting and the APN Inter-Governmental Meeting and Scientific Planning Group Meeting.

9. Four new project proposals, to be developed this year and some others to be explored.

New Projects on Global Change

At the START-Oceania Regional Committee meeting, held from 1-2 December, 2004, in Noumea, New Caledonia, it was decided that four new projects would be developed in 2005. The projects are:

1. A project on the second phase of AIACC to be developed by Prof. Koshy, by mid-June.
2. An IRD-led proposal on regional climate change issues, to be developed by Dr. Ganachaud.
3. A project on institutional arrangements for coastal management in Oceania, to be developed by Prof. Koshy, Prof. Harvey and Dr. Mike Hilton and a draft to be taken to the Kobe meeting, in April.
4. A preliminary outline of a project on human dimensions of climate change, to be developed by Dr. Campbell, by April.

Research Project on Intraseasonal Variations in Precipitation (Indian to west Pacific Ocean)

The Department of Geography at East Carolina University is conducting research on intraseasonal variations in precipitation from the Indian to west Pacific Ocean as a forcing mechanism for El Niño/Southern Oscillation (ENSO). The study region includes the countries of Sri Lanka, Maldives, Indonesia, Malaysia, Philippines, Brunei, Papua New Guinea, Australia, Micronesia, and Fiji. The three-year project, funded by NASA's Precipitation Measurement Mission, is headed by principal investigator Dr. Scott Curtis. The study will analyse Tropical Rainfall Measuring Mission (TRMM) and other current satellite-based precipitation information for evidence of climate variations within the Indo-Pacific sector that are related to the development of El Niño. Part of the work, the climatology of precipitation over and surrounding key islands of the Maritime Continent, is the basis of Mr. Ahmed Salahuddin's Ph.D. thesis. For more information about the project please see: (<http://www.personal.ecu.edu/curtisw/>). A NASA web feature can be found at: (http://www.nasa.gov/vision/earth/lookingatearth/el_nino_ocean.html).

Other project areas identified for development during the year are:

1. Waste management, to be conducted by Prof. Koshy with SPREP.
2. Exploration of a possible project on water security by Prof. Koshy, Dr. James Terry, Dr. Biman Chand and Alastair Woodward.
3. Prof. Mike Hamnett will explore the possibility of another climate and health related project.
4. A project on population, to be discussed by Prof. Koshy and Ms. Kesaia Seniloli.

APN Liaison Officer Report for South Asia

Liaison Officer:

Dr. Chhemendra SHARMA

National Physical Laboratory

Dr. K.S. Krishnan Road, New Delhi – 110 012 India

Tel: +91-11-2574-2610-12 Ext. 2331

Fax: +91-11-2572-6938

Email: csharma@mail.nplindia.ernet.in
chhemendrasharma@yahoo.com

APN Liaison Officer Report for South Asia

- **Overview of work carried out on behalf of the APN:**


Contribution to the APN Newsletter

1. Submitted quarterly inputs about global change activities carried out in South Asia for the APN Newsletter.
2. Interacted with project leaders of APN funded projects in South Asia to submit articles for the APN Newsletter.

Information Exchange

1. Disseminated the APN 'Call for Proposals' among researchers and scientists of South Asia.
2. Assisted South Asian scientists in finding potential partners from the region, for collaborative research.
3. Assisted South Asian global change scientists in the development of their proposals, for submission to the APN.
4. Disseminated the APN's role and activities among South Asian researchers.
5. Distributed the APN Newsletter throughout the region.
6. Distributed reports of workshops and information of other global change events to the South Asian global change community.
7. Distributed information about START activities in the region.
8. Interacted closely with various START activities in the region.

Workshops Attended

1. Discussion Meeting on Urban Air Quality Management with Respect to Suspended Particulate Matter. 5 March 2004. New Delhi, India.
2. National Workshop on India's Initial National Communication (NATCOM) to the United Nations Framework Convention on Climate Change. 26 March 2004. New Delhi, India.
3. Workshop on Persistent Organic Pollutants (POPs). 7 May 2004. New Delhi, India.
4. IES-India Policy Makers Meeting. 29 June 2004. New Delhi, India.
5. India-US Meeting on Climate Change Science. 26-28 July 2004. Manesar, India.
6. Indo-EU Workshop on Climate Change and Natural Disasters. 6-10 September 2004. Hyderabad, India.
7. Round Table Consultation of Resource Panellists on Climate Change. 9 October 2004. New Delhi, India.
8. GCOS Regional Workshop for South & South-West Asia. 11-13 October 2004. New Delhi, India.
9. The 5th Authors/Experts Meeting for the Preparation of 2006 IPCC National Greenhouse Gas Inventories Guidelines: Waste. 2-4 November 2004. Ottawa, Canada.
10. Better Air Quality 2004. 6-8 December 2004. Agra, India.
11. UTURN Asia Combined APN Synthesis Workshop and SARCS Emission Project Initial Meeting. 6-8 January 2005. Chiang Mai, Thailand.
12. The 2nd Workshop on GHG Inventories in Asia Region. (APN CAPaBLE Programme.) 7-8 February 2005. Shanghai, na.

13. CGE Hands-on Training Workshop on National Greenhouse Gas Inventories for the Asian Region Shanghai. 8-12 February 2005. Shanghai, China.

- **Overview of Regional Activities:**

Workshops and Meetings

5 March, 2004. Discussion Meeting on Urban Air Quality Management with Respect to Suspended Particulate Matter. New Delhi, India

The Department of Science and Technology (DST) of India and the Japan International Cooperation Agency (JICA) organised a meeting to discuss the issue of urban air quality management, with specific focus on suspended particulate matter (SPM) in mega-cities like Delhi, due to their adverse impacts on human health.

26 March, 2004. National Workshop on India's Initial National Communication (NATCOM) to the United Nations Framework Convention on Climate Change. New Delhi, India

This workshop was held to apprise the Indian stakeholders and to discuss India's 'Initial National Communication,' which was prepared to fulfill India's commitment to the UNFCCC. A general description of steps taken or envisaged to implement the convention, in addition to other information related to the achievement of the objectives of the convention, was discussed during the workshop.

7 May, 2004. Workshop on Persistent Organic Pollutants (POPs). New Delhi, India

The 'Workshop on Persistent Organic Pollutants' (POPs) discussed the steps which are required to be undertaken by the Government of India to fulfill its commitment to 'The Stockholm Convention'. This is a global treaty to protect human health and the environment from persistent organic pollutants. Participants of this workshop discussed, in detail, the methodologies for preparing inventories of stock and emissions of POPs and monitoring mechanisms.

7-9 June, 2004. Regional Seminar on the United Nations Convention to Combat Desertification (UNCCD). Islamabad, Pakistan

The seminar launched the 'Thematic Programme Network (TPN6)' on the implementation of 'Integrated Local Areas Development Programme (LADPs)' initiatives in the context of the regional action programme to combat desertification, in Asia. Sixteen countries attended this seminar, which was expected to develop strategies to challenge the problem of desertification, by directly involving and coordinating with local communities. It is hoped that these strategies will help foster the growth of locally developed initiatives of combating desertification and assisting the poor, in managing natural resources.

29 June, 2004. IES-India Policy Makers Meeting. New Delhi, India

The U.S. Environmental Protection Agency (USEPA), U.S. Agency for International Development (USAID), the Environmental Protection Training and Research Institute (EPTRI) and the National Renewable Energy Laboratory (NREL) organised a 'Policy Makers Meeting,' in New Delhi, to disseminate the results of their 'Integrated Environmental Strategy (IES) Program,' in India. The 'IES-India Program' is a co-benefit

assessment program that focuses on the following themes: identifying and analysing clean energy policies and measures that reduce local air pollution, calculating the associated public health and economic value of the air quality improvements, and qualifying the reduction of greenhouse gas emissions. This program includes education/outreach activities, targeting the private sector and the general public, to help build collaboration for implementation of cost effective measures.

26-28 July, 2004. India-US Meeting on Climate Change Science. Manesar, India

This meeting brought together scientists from India and the U.S. to discuss specific technical and research integration aspects of joint science projects. These projects are intended to address gaps in the knowledge base and, therefore, improve the overall observational and predictive capabilities in the climate change arena. This meeting on climate change focused on key priority areas such as, aerosols forcing, seasonal forecasting, ocean observations and monitoring atmospheric gases.

6-10 September, 2004. Indo-EU Workshop on Climate Change and Natural Disasters. Hyderabad, India

This workshop provided a forum for experts, from the European Union and India, to discuss both current and long-term issues related to natural disasters and climate change. Various research areas under 'Climate Change' include: global warming and climate change, atmospheric pollutants and climate forcing, albedo reduction, micro and meso-scale climate modelling, ocean atmosphere coupling, stratospheric ozone and climate interactions, tropical monsoon dynamics, satellite climatology and, medium range weather forecasting, etc. Under the theme of 'Natural Disasters,' research issues include: floods and flash floods, earthquakes, landslides, forest fires, desertification and droughts.

9 October, 2004. Round Table Consultation of Resource Panellists on Climate Change. New Delhi, India

The primary objective of the workshop was to bring together key scientists, legislators, administrators and non-governmental organisations, from the international and national community, to assess the rapidly changing environment and examine new proposals for international cooperation, based on principles of contraction and equity. During this conference, the participants from India and Europe debated the global campaign for the principle of equity to be incorporated into international climate change policy.

11-13 October, 2004. GCOS Regional Workshop for South and South-West Asia. New Delhi, India

The regional workshop of Global Climate Observing Systems (GCOS) for South and South-West Asia was hosted by India Meteorological Department in New Delhi from 11-13 October, 2004, during which delegates from South and South-West Asia discussed opportunities to improve the GCOS network, in this region.

9-11 November, 2004. The 22nd Session of the IPCC. New Delhi, India

The Inter-governmental Panel on Climate Change (IPCC) met from 9-11 November, 2004, in New Delhi to discuss the scope, content, and process of its 4th Assessment Report (AR4). The IPCC's 22nd session addressed the following: AR4 Synthesis Report, various other AR4 products, outreach and communications strategies for AR4 and, the IPCC's programme and budget for 2005-8, and election procedures. Delegates also heard

progress reports on: working group contributions to the AR4, the Special Report on Safeguarding the Ozone Layer, the Global Climate System, the Special Report on Carbon Dioxide Capture and Storage, the 2006 IPCC Guidelines for National Greenhouse Gas Inventories and, the work of the Task Group on Data and Scenario Support for Impact and Climate Analysis.

24-26 November, 2004. GFSE Regional Workshop - Access to Energy for Sustainable Development and Policies for Rural Areas. Paro, Bhutan

The Global Forum on Sustainable Energy organised the workshop to discuss access to energy supplies as a means of securing sustainable development in the rural areas of a region. The regions cover parts of Afghanistan, Bangladesh, Bhutan, China (Tibet), India, Myanmar/Burma, Nepal, and Pakistan. In addition, the workshop included discussions on the Millennium Development Goals, and on the EU-Energy Initiative (EUEI), which focuses on poverty eradication and sustainable development.

5-6 December, 2004. Securing Sustainable Livelihoods in the Hindu Kush-Himalayas: Directions for Future Research, Development, and Cooperation. Kathmandu, Nepal

The International Centre for Integrated Mountain Development (ICIMOD) organised the symposium to reflect on the Centre's achievements during the past two decades and to look into the future in order to meet the challenges emerging in the HKH region.

6-8 December, 2004. Better Air Quality 2004. Agra, India

The Clean Air Initiative for Asian Cities of the Asian Development Bank organised the Better Air Quality (BAQ) 2004 regional workshop, in Agra. More than 600 experts from around the globe gathered, during BAQ 2004, to discuss air quality issues and present updated information on air quality management research and strategies. The workshop also provided a venue for senior policy-makers and stakeholders, in Asia, to exchange experiences. The details of BAQ 2004 and the various presentations made during the workshop are available at (www.baq2004.org).

Capacity Building Activities

The APN CAPaBLE Programme:

Under the APN CAPaBLE Programme, the following workshops have been organised for capacity building/capacity enhancement of South Asian researchers:

1. South Asia Regional Training Workshop on Crop Simulation Modeling. June 28 - July 9 2004 at Chiang Mai University, Thailand, under APN CABaBLE project (2003-CRP-Theme I- Khan).
2. Workshop on Integrated Assessment Models for Developing Countries- Sustainable Development and GHG Mitigation Opportunities. 9-10 August 2004 at Asian Institute of Technology, Bangkok, Thailand, under APN CABaBLE project (2003-CRP-Theme II- Shukla).
3. South Asia Training Workshop on Watershed/Water Management Modelling. 4-15 October 2004, Islamabad, Pakistan, under APN CABaBLE project (2003-CRP-Theme I- Khan).

4. South Asia Workshop on Review and Harmonisation of Climate Change Scenarios. 13-17 December 2004, Kathmandu, Nepal, under APN CABaBLE project (2003-CRP-Theme I- Khan).

START Advance Institutes:

START Advance Institute 1: Climatic Variability and Food Security – Projects in South Asia

1. Application of Seasonal Climate Forecast for Sustainable Agriculture Production in Telangana sub-division of Andhra Pradesh, India – K.K. Singh.
2. Improving Food Security and Resource Use of Irrigated Crop Production Systems Through Climate Forecasts in Southern India - R. Selvaraju.
3. Will Climate Forecasting and New Knowledge Tools Help Resource-Poor Farmers From Debt to Prosperity? Farmers’ Participatory Approach to Manage Climate Variability (India) - Nageswara Rao.
4. Localised Climate Forecasting System: Seasonal Climate and Weather Prediction for Farm Level Decision-Making (India) - Rengalakshmi Raj.

START Advance Institute 2: Urbanisation, Emissions, and the Global Carbon Cycle – Projects in South Asia

1. Energy, Environment, and Mobility in South Asian Cities - Ranjan Bose.
2. Economic Analysis of Health Benefits from Air Pollution Reduction: A Comprehensive Study of Delhi and Calcutta - Mitali Das Gupta.
3. Urban Transportation and Emission Interactions in Kathmandu Valley, Nepal: Strategies for integrated carbon concerns into local air pollution - Shobhakar Dhakal.
4. A Quality-of-Life Approach to Sustainable Transportation in the Colombo Metro Region, Sri Lanka: A model for other South Asian Cities - Rohinton Emmanuel.

START Advance Institute 3: Assessing Vulnerability to Global Change and Global Environmental Risks – Participants selected from South Asia

1. Ulka Kelkar (India), Upasana Sharma (India) & Archana Shrestha (Nepal).

• Outcomes and Products:

1. The ‘Sri Lanka National Committee of IGBP’ published the final report of the APN project on ‘Assessment of Nutrient, Sediments and Carbon Fluxes to the Coastal Zone in South Asia and their Relationship to Human Activities’. Australia, Bangladesh, India, Nepal, Pakistan, Sri Lanka and the USA participated in this project. The final report is available at (www.nsf.ac.slk/slaas/cfweb) and CD-ROM.
2. LOICZ is establishing a ‘Regional IPO Node,’ in Colombo, Sri Lanka, under its programme of setting up a network of regional IPO Nodes during its second phase (2003-2012). The National Science Foundation of Sri Lanka will host this facility.
3. The Ministry of Environment and Forests, in India, has released the following publications under activities related to India’s Initial National Communication to UNFCCC:

- a. Proceedings of the Workshop on Uncertainty Reduction in Greenhouse Gas Inventories.
- b. Proceedings of the Workshop on Vulnerability Assessment and Adaptation Due to Climate Change on Indian Agriculture, Forestry and Natural Ecosystems.
- c. Proceedings of the Workshop on Vulnerability Assessment and Adaptation Due to Climate Change on Indian Water Resources, Coastal Zones and Human Health.
- d. Proceedings of the Workshop on Scenarios and Future Emissions.

- **Future Activities:**

Reinforcement of networking efforts among the scientists, researchers and other stakeholders in the South Asian region.

- **START Regional Committee Members**

SASCOM Chairman

Dr. Amir Muhammed
 President, Asianics
 Agro-Development International
 13, St. 49, F-6/4 Islamabad
 Pakistan
 Tel: 92-51-9222-277
 Fax: 92-51-276-492
 Email: amir@nu.edu.pk

Dr. G.B. Pant

Director, Indian Institute of
 Tropical Meteorology, Dr. Homi
 Bhabha Road, Pashan, Pune 411 008
 India
 Tel: 91-20-2589-3924
 Fax: 91-20-2589-3825
 Email: gbpant@tropmet.res.in

Members:

Dr. A.P. Mitra
 Honorary Scientist of Eminence
 National Physical Laboratory
 Dr K.S, Krishnan Road, New Delhi –
 110012 India
 Tel: 91-11-2574-5298
 Fax: 91-11-2572-6938
 Email:
 apmitra@mail.nplindia.ernet.in

Dr. A.M. Choudhury

Road 12/A, Parc Palais
 House 74, Flat D-5, Dhanmondi
 R/A, Dhaka, Bangladesh
 Tel: 880-2-8614-224
 Fax: 880-2-8613-773
 Email: amcicst@yahoo.com

Prof. (Mrs.) Sulochana Gadgil
 Centre for Atmospheric and
 Oceanic Sciences
 Indian Institute of Science
 Bangalore 560 012 India
 Tel: 91-80-2309-2505
 Fax: 91-80-2360-0865
 Email: sulo@caos.iisc.ernet.in

Dr. R.R. Vaghjee

Tagore Lane, Mansil
 Mauritius
 Tel: 230-6964-014
 Email: meteo@intnet.mu

Dr. K.L. Shrestha

Advisor
 Ministry of Science and Technology
 Singh Durbar, PO Box 12088
 Kathmmandu, Nepal
 Tel: 977-1-244-698
 Fax: 977-1-225-474
 Email: klshrestha@wlink.com.np

Dr. Janaka Ratnasiri
Sri Lanka Association for the
Advancement of Science
120/10 Vidya Mawatha
Colombo 07, Sri Lanka
Tel: 94-1-691-681, 464-473
Fax: 94-1-691-681
Email: janakar@itmin.com

APN Liaison Officer Report for Temperate East Asia

Liaison Officer:

Ms. Yang YING

Institute of Atmospheric Physics
Chinese Academy of Sciences
P. O. Box 9804, Beijing 100029
P. R. China

Tel: +86-10-62041317

Fax: +86-10-62045230

Email: sec@tea.ac.cn

APN Liaison Officer Report for Temperate East Asia

- **Overview of work carried out on behalf of APN:**

1. Contribution to APN newsletter
 - a. Submitted quarterly regional reports for the APN newsletter.
2. Information exchange
 - a. Distributed the announcement of the APN call for proposals 2004-2005 to individual scientists, corresponding institutes and TEACOM members.
 - b. Distributed APN newsletters, leaflets and other related information to individual scientists, corresponding institutes and TEACOM members.
 - c. Communicated regularly with APN national Focal Points, SPG members and project leaders of APN Projects in East Asia.
3. Workshops attended as APN Liaison Officer
 - a. 26-28 July, 2004. The first review meeting of the APN/SCOPE/START book: A Review of Global Change Research in East Asia: Changes in the Human-Monsoon System of East Asia. Beijing, China.
 - b. 6-8 October, 2004. Workshop on APN/START/SCOPE Rapid Assessment of Global Environmental Change in East Asia. Hangzhou, China.
 - c. 4-9 December, 2004. Workshop on Climate Variability and Human Activities in Relation to Northeast Asian Land-ocean Interactions and Their Implications for Coastal Zone Management (APN 2004-18-NMY). Nanjing, China.

- **Overview of Regional Activities:**

Workshops and Meetings

March 22-26, 2004. The International Conference on High-Impact Weather and Climate: Understanding, Prediction, and Socio-Economic Consequences (ICHWC 2004). Seoul, Republic of Korea

ICHWC 2004, organised by KMA, KMS and the World Meteorological Organization (WMO), commemorated the centennial anniversary of modern meteorological observations by the Korea Meteorological Administration (KMA) and the 40th anniversary of the Korean Meteorological Society (KMS).

The conference consisted of three sub-conferences: weather, climate, and socio-economic impacts. Recently, the world has been suffering from extreme changes in weather and climate, which has caused a significant impact on human lives, societies, and economies. The conference offered an opportunity to disseminate knowledge, experience, and information on the diverse fields of high-impact weather and climate, among the participating scientists. It also contributed to the future organisation of international cooperative research on high-impact weather and climate.

24-29 May, 2004. The 4th International Symposium on Asian Monsoon System (ISAM4). Kunming-City, Yunnan Province, China

The symposium was organised by the Institute of Atmospheric Physics, Chinese Academy of Sciences (IAP/CAS), the University of Tokyo (Japan), and the Korea Meteorological Administration (KMA). It was hosted by the Project of Research on the Formation Mechanism and Prediction Theory of Severe Climate Disasters in China—National Key Programme for Developing Basic Sciences, the IAP/CAS, the National Natural Science Foundation of China (NSFC) and the University of Yunnan. The symposium was supported by the State Ministry of Science and Technology (SMST) and NSFC.

Symposium topics included: Variability and Predictability of Asian Monsoon Systems, Physical Processes of Monsoon Variations, Impact of the Asian Monsoon on Droughts and Floods, Linkages between Monsoon Climate and Monsoon Weather, Analysis and Application of Monsoon-Related Field Experimental Data, Application of Satellite Remote Sensing Techniques to Asian Monsoons, Interaction between Monsoon and ENSO, Modelling of Asian Monsoon System, and Impacts of Global Warming on Asian Monsoons.

The symposium provided a good opportunity to exchange advanced ideas and experiences on the Asian Monsoon System, to discuss and re-evaluate our ability to predict monsoons by understanding their physical processes, and to exchange cooperative activities among monsoon scientists in East Asia and other countries. Furthermore, indices for measuring monsoons were also discussed at this symposium.

25-28 May, 2004. International Conference on the Urban Dimensions of Environmental Change: Science, Exposures, Policies and Technologies. Shanghai, China

This conference was sponsored by Montclair State University and East China Normal University, and partially funded by the U.S. National Science Foundation, National Natural Science Foundation of China, Shanghai Commission of Science and Technology, Hunter College and City University, New York.

Among the fundamental challenges of the present era are the range, complexity and interlocking nature of environmental problems, in urban areas and the limited response capacity and capability of cities. The conference addressed these challenges by integrating the concepts of vulnerability, sustainability, and environmental equity into the analysis of urban environmental management. These concepts have been formally theorised to a varying extent, but they do not yet to play a significant role in informed discussions of the urban environmental management community.

This conference, examined the causes, impacts, and responses to environmental change in the world's major cities and urban areas, as they relate to the issues of science and management. Topics included: policy, regulation, technology, impact adaptation, mitigation, remediation, and the need for integrated management structures, which relate to the complexity of environmental problems in urban areas. Discussions also pivoted on the implications of new and emerging environmental stresses, such as global climate change and the need for increased stakeholder involvement in urban environmental management. A fundamental question is: how current processes of urban environmental change and management (including problem identification, policy development, and policy implementation) intersect with issues of vulnerability, sustainability, and equity? All of which are emerging as crucial issues, in both developed and developing cities.

19-20 June, 2004. The 12th Environment Congress for Asia and the Pacific (ECO ASIA 2004). Tottori, Japan

The Ministry of Environment of Japan organised and hosted the Environment Congress for Asia and the Pacific, which is an informal meeting of Environment Ministers from the Asia-Pacific region. The objective of the congress is to provide a forum in which Environment Ministers freely exchange views, as well as to promote cooperation in the environmental field in the Asia-Pacific region.

This congress was participated by Environment Ministers from Australia, Bangladesh, Brunei, Cambodia, Canada, China, Fiji, India, Indonesia, Japan, Lao PDR, Malaysia, Mongolia, Myanmar, Nepal, New Zealand, Pakistan, Papua New Guinea, Philippines, Republic of Korea, Russia, Samoa, Singapore, Sri Lanka, Thailand, Tonga, Tuvalu, United States of America and Viet Nam. Representatives from international organisations, including APN, were also in attendance.

27-30 June, 2004. The 3rd International Ocean-Atmosphere Conference of the Global Chinese. Beijing, China

The Third International Ocean-Atmosphere Conference of the Global Chinese, hosted by the Institute of Atmospheric Physics, Chinese Academy of Sciences, convened in Beijing, China. The conference, jointly organised by the Chinese Meteorological Society (CMS), the Chinese Oceanic Society (COS), the Institute of Atmospheric Physics (IAP) and the Chinese-American Oceanic and Atmospheric Association (COAA), provided a forum to present state-of-the-art science and technology, to discuss new developments, and to exchange ideas between different disciplines. What's more, the conference afforded the opportunity for professional networking; a great opportunity for individual and group collaboration between international scientists and engineers.

The theme of COAA 2004 was monitoring, prediction and understanding of extreme weather and climate, environmental protection, and oceanic resources. The conference program consisted of plenary sessions, scientific sessions, poster sessions, social activities and tours. A number of workshops and summer classes will follow the conference.

Presentations were given on the following issues: (A.1) Modelling and forecast of weather and climate, (A.2) Climate variability, global change and implications for East Asia, (A.3) Severe storms and flash floods, (A.4) Tropical meteorology, (A.5) Atmospheric remote sensing and data assimilation, (A.6) Boundary layer, and air-land interaction, (A.7) Air/cloud chemistry, aerosols, and urban environment, (A.8) Observations and modelling of hydrological processes, (O.1) New concepts, theories, methods and applications to oceanic sciences, (O.2) Field observations, (O.3) Laboratory and numerical simulations, (O.4) Oceanic remote sensing and data assimilation, (O.5) Ocean technology/engineering and navigation, (O.6) Air-sea interaction, (O.7) Physical oceanography, and other related topics.

5-9 July, 2004. Training Workshop on Sea and Human Security. Hiroshima, Japan

Forty-two participants, resource persons and observers, from 17 countries of the Asia-Pacific region, attended the week-long event. Participants included mid-career and high-level officials from Government organisations, as well as researchers and academics from oceanography or scientific institutions. The workshop was the first event of a three-year succession (2004-2006), on sea and human security. It followed

the United Nations Institute for Training and Research (UNITAR) International Conference on Sea and Human Security (2002). Its objectives were to study the multiple dimensions of human security pertaining to seas and to contribute to national policy and institutional capacity in the management and protection of seas and oceans, through training.

The focus of discussion at the 2004 training workshop included: International maritime dispute settlement, Ocean governance structure, Balance between development and environmental protection, Coastal zone management, Marine environmental management and industrial involvement, Ports and sustainable development, Marine environmental monitoring and, Presentations of selected case studies (country reports and project reports).

The second cycle of the Sea and Human Security succession aims at conducting follow-up national/sub-regional sessions, in order to further intensify UNITAR's, training of trainers (ToT), objective. Participants of the 2004 workshop submitted project documents for UNITAR to consider follow-up possibilities and needs. Each year, two-to-three countries/institutions will be selected to co-organise modules at a country or sub-regional level, together with UNITAR. The overall (Asia-Pacific) regional objective will be to address the trade-off between development and conservation. HOAP, in cooperation with resource persons and partner institutions, will identify the main topics for each session throughout autumn and winter 2004, and training sessions could be organised in spring 2005.

16-25 July, 2004. International Conference on Environmental Observations, Modelling and Information Systems ENVIROMIS—2004 and INTAS Strategic Scientific Workshop “Towards Integrated Multidisciplinary Study of the Northern Eurasia Climatic Hot Spot”. Tomsk, Russian Federation

The conference was jointly organised by the Siberian Center for Environment Research and Training (www.scert.ru), the Institute for Optical Monitoring of the Siberian Branch of the Russian Academy of Sciences and, the Institute for Numerical Mathematics RAS, under the auspices of INCO Programme, INTAS and the IGBP National Committee.

The whole event was also aimed at overcoming the interdisciplinary barriers between specialists from different fields of environmental science, in addition to, narrowing the generation gap occurring in Environmental Sciences. It was also crucial for NIS countries, which are not yet in the EC. In order to mitigate its consequences and to facilitate professional skill growth for young scientists, a number of lectures were presented by leading NIS and European specialists, which allowed young participants to get first hand information about the hot topics of Environmental Science. Hopefully, this will draw them professionally to this vital field.

Amongst the participants were young and prominent scientists from Russia, Azerbaijan, Belarus, Georgia, Ukraine, Uzbekistan, Belgium, Germany, France and Italy. All participants unanimously thanked funding organisations, notably EC INCO Programme and INTAS, for their support of this significant event. The INTAS Strategic Scientific Workshop resulted in a clear vision regarding the development of the integrated regional study of the Earth System Science Partnership and identified the steps needed to be taken to aid the process.

The event had a strong impact on the new generation of cooperative links between NIS and INTAS country researchers. This should result in the establishment of a coherent set of new cooperative environmental projects.


26-28 July, 2004. The 1st Review Meeting of the APN/SCOPE/START Book: A Review of Global Change Research in East Asia: Changes in the Human-Monsoon System of East Asia. Beijing, China

This review meeting in Beijing received financial support from the START Regional Center for Temperate East Asia (START TEA-RC) and the International START Secretariat. In attendance were the International START Secretariat Director and Deputy Director, ICSU Vice-President, SCOPE Editor-in-Chief, Director of Department of High and New Technology Industrialisation of MOST, Deputy Director of Bureau of Resources and Environment of CAS, Lead Authors of the APN/SCOPE/START Book in China and START TEA-RC researchers.

To meet the original design of the APN/SCOPE/START rapid assessment project, each chapter initially focused on major progress related to “what we know”. The main scientific issues needed to be addressed, i.e., “what we do not know, but need to know”. As Part I of the APN/SCOPE/START Rapid Assessment Project, this workshop has been a good experience for follow-up activities in two other regions. Moreover, based on the current process summarised by this Beijing Workshop, the MAIRS East Asia Rapid Assessment Workshop will convene on 6-8 October, 2004, in Hangzhou.

4-6 August, 2004. The 4th International Symposium on the Tibetan Plateau I you. Lhasa, Tibet, China

The symposium was facilitated by the Institute of Tibetan Plateau Research, the Chinese Academy of Sciences (ITP, CAS), the Bureau of Sciences and Technology, the Tibet Autonomous Region and, the P. R. China and China Society on the Tibetan Plateau (CSTP).

The China State Key Project on Fundamental Research Planning “Formation and Evolution of Tibetan Plateau with its Environment and Resource Effects,” which has been in operation since 1998, has already made great progress in fundamental theories and practical applications including: continental collision dynamics, plateau uplifting and abrupt environmental changes, ecology system of the plateau and global change, epigenetic processes of the plateau and their interaction mechanisms and, regional sustainable development on the plateau, etc. Internationally, Tibetan plateau research has been continuously developed and strengthened. , from a series of joint projects, based upon regional integrated investigations, developed as a scientific field with synthetic characters. This symposium provided a forum for scientists, interested in Tibetan plateau research, to strengthen the exchanges of achievements made thus far and to promote further research cooperation and improvement, in the quality of research.


6-8 October, 2004. Workshop on APN/START/SCOPE Rapid Assessment of Global Environmental Change in East Asia. Hangzhou, China

The Workshop, jointly supported by the APN, START funding from IGBP/ICSU, the Chinese Academy of Sciences (CAS), the Chinese Association of Science and Technology (CAST) and IGAC, was held in Hangzhou, China, 6-8 October, 2004.

The workshop was attended by lead authors of the APN/START/SCOPE East Asia Rapid Assessment Book, Monsoon Asia Integrated Regional Study (MAIRS) SSC members, scientists and experts in related areas, representatives from supported international organisations, and TEACOM members. Prof. Guo Huadong, the Secretary General and Director of Bureau of International Cooperation, Chinese Academy of Sciences, Prof. Shao Liqin, Director of Department of High and New Technology Industrialisation, The Ministry of Science and Technology, Prof. Peter Tyson, Vice-president of ICSU, Prof. Roland Fuchs and Prof. Hassan Virji, Director and Deputy Director of International START Secretariat, Prof. Mike MacCracken, President of IAMAS, Prof. Fu Congbin, Chief Editor of APN/START/SCOPE East Asia Rapid Assessment Book and Director of START TEA-RC, Prof. John Steward, Chief Editor of SCOPE and, Ms. Yang Ying, APN Liaison Officer for East Asia Region, were also in attendance.

The workshop was opened by the host, Prof. Fu, and received welcome remarks from Prof. Guo Huadong of CAS and Prof. Shao Liqin of MOST. Prof. Peter Tyson and Prof. Roland Fuchs, on behalf of ICSU and START expressed their expectations and anticipations for the 4-day meeting and appreciated the support of MAIRS Project from the Chinese Government and scientists.

Presentations were given by the authors of the following five chapters: Driving forces of change, Variability of the East Asia Monsoon, Changes in land cover, ecosystems and regional climate and, Atmospheric composition changes and related impacts, and Changes in marine/coastal ecosystems.

During the 2-day workshop, participants were divided into four working groups to share their views and suggestions to improve these  chapters. The reporters of each group wrote a summary report of their session, which was then presented by the session chair in the Plenary Session. On the last day of the workshop, participants reviewed recommendations for observations and research from working groups 1-4 and considered a proposal for a coordinated regional observational, monitoring and modelling program. The participants also made recommendations on the direction of future research, under the MAIRS program for East Asia.

An Editorial Group Meeting and MAIRS Steering Group Meeting were held on 9 October 2004.

The APN/SCOPE/START Rapid Assessment book, part 1, A Review of Global Change Research in East Asia, will be published 9 months after the October workshop.

9-12 November, 2004. The 4th APCN Working Group Meeting and the 3rd APCN Steering Committee Meeting. Busan, Republic of Korea

The 4th APCN Working Group Meeting and the 3rd APCN Steering Committee Meeting were held in Busan, Republic of Korea, from 9-12 November, 2004.

APCN is a regional climate program designed to establish a communication channel for the exchange of regional climate information, among APEC economies.

APCN is aimed at producing reliable seasonal predictions to user communities, based on a well-validated, multi-model ensemble system (MMES). APCN produces real-time, seasonal forecasts and disseminates forecast products to member economies, which assist in the management of climate risks in the Asia-Pacific region.

The meeting received a welcome address from Kyung-Sup Shin, Administrator of KMA and was followed by four keynote lecturers: Prof. Yadowsun Boodhoo, President of CCI, WMO, Prof. Jose Luis Santos, Director of CIIFEN, Prof. Lorenz Magaard,

University of Hawaii and, Prof. In-Sik Kang, Seoul National University. Prof. Chuang-Kyu Park introduced the current status of APCN. The workshop is divided into three sessions:

Session I: Participating Models

Session II: APCN Seasonal Prediction System

Session III: Verification of APCN Products/Member Report

The APCN Steering Committee Meeting was held on 12 November, 2004.

4-9 December, 2004. Workshop on Climate Variability and Human Activities in Relation to Northeast Asian Land-ocean Interactions and Their Implications for Coastal Zone Management (APN 2004-18-NMY). Nanjing, China

This Project meeting received funding from APN and was kindly supported by the Geography Department of Nanjing University. Over 30 participants from Russia, People's Republic of China and Hong Kong, China attended this workshop. Also present was the APN Liaison Officer for East Asia Region, as the representative of APN.

Prof. Shu Gao, the Director of the Geography Department of Nanjing University, opened the workshop, followed by the APN Liaison Officer for East Asia Region, who then provided an update of APN activities. Dr. Konstantin A. Lutaenko, summarised the research that had been done so far and the remaining tasks that needed to be completed during this fiscal year. The participants then agreed on the main discussion points of 6th December.

On 5th December, the scientific presentations of the workshop were held in the lecture room of the Science and Technology Building of Nanjing University. Scientists of this APN project reported their research findings and some Chinese scientists introduced their related work on the Pearl River in China. Over 30 students, from the Geography Department of Nanjing University, were involved in this one-day scientific presentation.

On 6 December, participants discussed the outline of the monograph submitted to APN in 2006 and the final activity report for APN this year. After this workshop, participants of the project were asked to write a 3-page summary of their work, for the final activity report. At least one poster, such as the research about the Heilongjiang (Amur) River, will be provided to APN. Russian Scientists will try to include some results of this project to the Russian IGBP Annual Report. A number of research papers will be published in Russian.

7-8 December, participants participated in field observations of the Changjiang (Yangtze) River Delta, in Nanjing City and Zhenjiang City.

Proceedings of the workshop consisted of 30 scientific presentations which had been published before the meeting. This workshop also provided a good opportunity for the students of the Geography Department of Nanjing University to learn about current research results of the coastal zone areas and practice their English. Communications have been established between Chinese and Russian Scientists, as a result of the APN Project.

10-17 January, 2005. The 2nd-Year Workshop of an APN Project the Mega-Deltas of Asia: Conceptual Model and its Application to Future Delta Vulnerability (APN 2004-06-CMY)


Following the 1st year workshop, this workshop was jointly held with IGCP-475 and CCOP project (also headed by APN co-leaders, Dr. Y. Saito, and Dr. S. Goodbred). In total, more than 100 participants attended, of which more than 70 were from 22 countries and 30 from the host country, Viet Nam. As planned, the workshop focused on critiques of delta conceptual models, in light of the model establishment, in the past year. Modelling and management, both on natural and human dimensions, were key elements of the workshop. Individual Asia mega-delta models were addressed by local specialists in a series of keynote and oral presentations. During the workshop, a special session of delta-coast vulnerability, linked to the recent tsunami disaster, was organised. Invitations were given to those countries which suffered as a result of the tsunami, including Indonesia, India, Philippines, Sri Lanka, and Thailand, to make presentations. Japanese scientists were also invited to present their long-term observations on how recognise tsunami events in terms of mechanisms and the prevention of major impacts. Communications between physical and social scientists, engineers, and policy-makers went well. Issues were discussed at great length during the poster session, which added up to approximately 6 hours of the 3-day workshop. The workshop was beneficial for the 20 or so M.S and PhD local scientists, who are working on coastal environmental conservation. During the workshop, the opportunity for all participants to have an open discussion was arranged in order to hear feedback from the public, on our project themes. Comments can be viewed on the following website: (www.megadelta.ecnu.edu.cn). Pre-and-post meeting field trips took place to observe the evidence of sea-level fluctuations, sediment re-suspension, and coastal erosion of the Mekong delta coast.

May, 2004. Chinese-Taiwan Funds for Environment Projects

Chinese-Taiwan has awarded a total of US \$125,000 to the South Pacific Applied Geoscience Commission (SOPAC), for 2004 Projects. This includes a \$25,000 grant for new scholarships and \$100,000 for five small projects. The five smaller projects include: continued support of Regional Earth Day celebrations, capacity building exercises for Tuvalu in reducing vulnerability to disasters and, water quality monitoring in the region. Other major areas such as, monitoring change in the Pacific Ocean and continuing the assessment of wave energy potential towards establishing a pilot project in the Pacific, will also benefit from these funds.

• Outcomes and Products:

1. The IGBP Series: Global Change and the Earth System, A Planet Under Pressure, W. Steffen, A. Sanderson, P. D. Tyson, J. Jager, P.A. Matson, B. Moore III, F. Oldfield, K. Richardson, H. J. Schellnhuber, B. L. Turner II, R. J. Wasson, Springer, ISBN 3-540-40800-2, 2004
2. Proceedings of the APN Workshop on Climate Variability and Human Activities in Relation to Northeast Asian Land-ocean Interactions and Their Implications for Coastal Zone Management (APN 2004-18-NMY)
3. Outputs of the APN Project The Mega-deltas of Asia: Conceptual Model and its Application of Future Delta Vulnerability (APN 2004-06-CMY): 1) Workshop abstract proceedings and field trip guide; 2) APN Proceedings (being published at

China Ocean Press, available in the late 2005); 3) N project website: (www.megadelta.ecnu.edu.cn); 4) Peer-reviewed papers; draft manuscripts prepared by APN leaders participants; 5) A summary of the Ho-Chi-Minh Workshop on CD-ROM.

- **Future Activities:**

1. Monsoon Asia Integrated Regional Studies (MAIRS)

As part of the Monsoon Asia Integrated Regional Studies (MAIRS), the APN/SCOPE/START Rapid Assessment Project will continue the rapid assessment book in South Asia and Southeast Asia region. The first APN/SCOPE/START Rapid Assessment book will be published within 9 months of the October Hangzhou meeting. The International Project Office (IPO) formally opens in early 2005 at the Institute of Atmospheric Physics, Chinese Academy of Sciences. A Deputy Director and Information Officer will be appointed to work at the IPO.

2. The Mega-deltas of Asia: Conceptual Model and its Application to Future Delta Vulnerability (APN 2004-06-CMY)

It is imperative for further collaboration through new funding, aimed at: 1) regional workshops to disseminate information, 2) field work in selected key areas and, 3) continuation of the effort to expand the knowledge of the delta model. Such efforts are already underway with the joint IGCP-475 Delta-MAP and CCOP DelSEA project co-led by Drs. Saito and Goodbred. Limited funding (less than US \$10,000) can, however, be used to support many participants from developing nations. Now, the APN Mega-Delta leaders and participants have found a renewed urgency to continue our work that began in the 1st and 2nd year of the APN project.

START Regional Committee Members

Prof. Punsalmaa Batima

Institute of Meteorology & Hydrology
Hudaldaamy Gudamj-5 Room 217
Ulaanbaatar-46
Mongolia
Tel: +976-11-318-750/ 9927-4976
Fax: +976-11-318-750
Email: mcco@magicnet.mn

Prof. Vladimir Kasyanov (Chair)

Marine Biology Institute
Far East Branch, Russian Academy of
Sciences
Russia
Tel: +7-4232-310-905
Fax: +7-4232-310-900
Email: inmarbio@mail.primorye.ru

Prof. Congbin Fu (Director)

START RC for Temperate East Asia
China
Tel: +86-10-6204-1317
Fax: +86-10-6204-5230
Email: fcf@tea.ac.cn

Prof. Song-Gun Kim

Biological Branch, Academy of
Sciences
D.P.R. Korea
Tel: +850-2-5217-883
Fax: +850-2-3814-580

Prof. Ming H. Wong

Institute for Natural Resources and Waste
Management

Hong Kong Baptist University
China

Fax: +85-233-95995

Email: mhwong@hkbu.edu.hk

Prof. Dong-Kyou Lee

Atmospheric Sciences Program

School of Earth and Environmental
Sciences, Seoul National University

Republic of Korea

Tel: +82-2-880-6716

Fax: +82-2-885-4448

Email: dklee@nwp2.snu.ac.kr

Japanese Representative

(To be determined)