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2004/2005

APN
Asia-Pacific Network for Global Change Research

2004/2005 Annual Report

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DIRECTORS' MESSAGES

It is my pleasure to publish this 2004/2005 Annual Report of activities. This was one of the APN's most successful years. Goal 2 of the APN is to "strengthen appropriate interactions among scientists and policy-makers, and provide scientific input to policy decision-making and scientific knowledge to the public." This annual report aims to realize this goal by providing non-technical summaries, of APN funded projects, to decision- and policy-makers and the general public.

I would like to extend my thanks for this success to Mr. Sombo Yamamura; the Director of the Secretariat until August 2005, in addition to the Steering Committee and the Secretariat, under whom the work outlined in the 2004/2005 Annual Report was carried out.

Hiroki Hashizume
Director, APN Secretariat, March 2006

The year 2004/2005 should be noted as a milestone year for the APN. This is the first year that all administrative functions of the APN Secretariat were transferred under the umbrella of the Institute for Global Environmental Strategies as of 1 April, 2004. The establishment of an APN independent account, which is subject to external audit, is both significant and timely, particularly as the APN has entered its second phase.

A yearlong evaluation on the APN's activities for the past ten years and the preparation of the Second Strategic Plan (2005-2010) were successfully completed. There were also other important activities throughout the year, which included the Augmented Steering Committee Meeting in October 2004, and the APN/WHO Public Forum on "Climate Calamities and Human Health" at the World Conference on Disaster Reduction in January 2005.

Furthermore, I would like to express my deepest appreciation to the countries, governments, organizations and individuals of the APN, who kindly provided financial and in-kind support, as well collaboration and cooperation on other activities.

Sombo T. Yamamura
Director, APN Secretariat, July 2005

MISSION AND GOALS

APN's Mission

The mission of the Asia-Pacific Network for Global Change Research (APN)¹ is to enable investigation of change in the Earth's life support systems as it occurs in the Asia-Pacific region to:

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

APN's Goals

The APN has identified five goals through APN-funded activities; these activities are selected from the Annual Regional Call for Proposals (ARCP) process, as well as the APN's capacity development programme, CAPaBLE.

Goal 1. Supporting regional cooperation in global change research on issues particularly relevant to the region

Goal 2. Strengthening appropriate interactions among scientists and policy-makers, and providing scientific input to policy decision-making and scientific knowledge to the public

Goal 3. Improving the scientific and technical capabilities of nations in the region

Goal 4. Cooperating with other global change networks and organisations

Goal 5. Facilitating the development of research infrastructure and the transfer of know-how and technology

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

CORE STRATEGIES AND VISION

Core Strategies

The core strategies of the APN are to:

1. Encourage and promote research that has the potential, in addition to improving understanding of global change and its implications in the region, to contribute to the establishment of a sound scientific basis for policy-making with regard to issues for which global change is an important factor.
2. Identify, in consultation with policy-makers and practitioners, the present and future needs for such research.

Vision

Changes in the Earth system are clearly impacting the societies and economies of the countries within the Asia-Pacific region. These countries support more than half of the world's population. Recent research and supporting observations have provided new insights into some of these changes and their impacts, but have at the same time opened a number of new and challenging scientific issues.

The APN seeks to identify such emerging issues and to promote and encourage regional cooperative research to address these. In doing so, the APN assures that the results of this research contribute to the development of a sound scientific basis for policy- and decision-making related to issues for which global change is an important factor.

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



APN FUNDED PROJECTS

APN FUNDED PROJECTS

ARCP

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

APN2004-02CMY-Muhammed: Water Resources in South Asia: An Assessment of Climate Change-associated Vulnerabilities and Coping Mechanisms

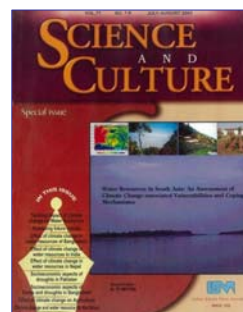
Project Leader: Dr. Amir Muhammed

Email: amir.muhammed@nu.edu.pk

Funding: US\$ 180,000 for three years

Participating Countries: Bangladesh, India, Nepal, Pakistan and the USA

Summary: South Asia is highly sensitive to global climate variability, change and extremes. The region depends heavily on the precipitation of the variable regional monsoon, as well as water derived from snow and glacier melt in the Himalayas; both of which are affected by climatic change. The project brought together scientists from meteorology, climate science, hydrology, economics and agriculture, to study climate change in South Asia in 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 showed interest in the project because of its importance in planning the harnessing of future water resources in light of anticipated climate change. Because of likely water shortages and the inability to meet agricultural requirements in a large part of the sub-continent, the urgency to develop new techniques to improve water use efficiency for crop production has been widely appreciated. Use of multi-media techniques, developed as part of the project to disseminate the improved technology especially to illiterate farmers, is likely to prove very effective. For flood prone areas, the project analyzed the



incidence of past floods and future trends and discussed mitigation measures to forewarn the population of the incidence of floods and make arrangements to minimize damage.

Publications:

- Science and Culture Special Issue; Vol.71, NO.7-8, July-August 2005.

APN2004-03CMY-Campbell: Inventory of 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

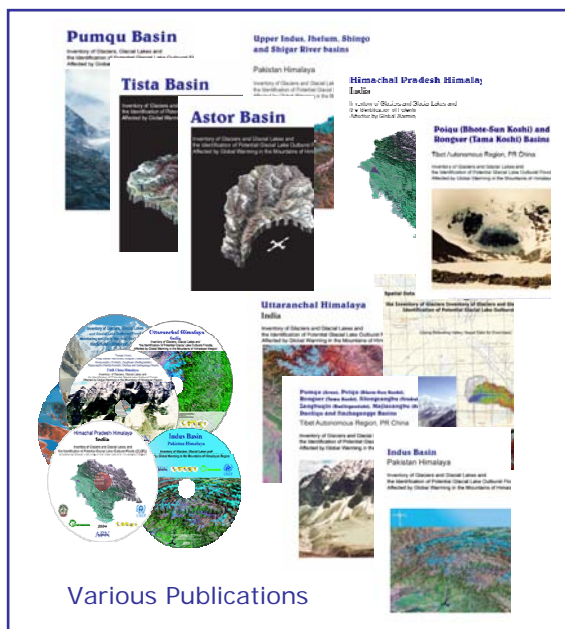
Project Leader: Dr. Gabriel Campbell

Email: gcampbell@icimod.org.np

Funding: US\$ 219,340 for three years

Participating Countries: India, Pakistan and P. R. China

Summary: Over three years, a systematic study on the inventory of glaciers and glacial lakes was completed using Remote sensing satellite and topographic data and a comprehensive database was developed. A semi-automatic methodology for inventory of glaciers and glacial lakes was developed for future glacial monitoring. One of the major objectives of this study was to identify areas where GLOF events could pose a potential threat in the near future. Based on detailed criteria, potentially dangerous lakes were identified and need to be monitored in the future. These results thus provided the basis for the development of a monitoring and early warning system and for the planning and prioritization of disaster mitigation efforts that could save many lives and properties situated downstream, as well as guidelines for infrastructure planning. The series of reports with information on the glaciers, glacial lakes and GLOFs of the HKH region in



Website: <http://www.icimod-gis.net/web/glof/glof.php>

compatible and comparable format have filled a pressing need. The database will greatly enhance the ability of global and regional climate researchers, national policy-makers, land-use and water resource planners, as well as the general public, to understand and mitigate GLOF-associated hazards, thus linking science to policy.

The project provided an opportunity for professionals and institutions among partners/collaborators of the region, and beyond, to learn more about the methodology and related activities to build up their confidence for future work and further cooperation. This project enabled the capacity building of affiliated partner institutions and strengthened the collaboration between the APN, START, UNEP/RRC-AP, ICIMOD, CAREERI, BHT, PARC, CSKHPAU and WIHG to continue to assist in developing regional capacity and co-operation.

Publications:

- Nine printed reports and inter-active CD-ROMS: Inventory of glaciers and glacial lakes and the identification of potential glacial lake outburst floods (GLOFs) affected by global warming in the mountains of Himalayan region.
 - Training manual: Spatial data input, attribute data handling and image processing for the inventory of glaciers and glacial lakes and identification of potential glacial lake outburst floods.
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2004-04CMY-Skole: Regional, Multi-scaled, Multi-temporal Land Use and Land Cover Data to Support Global Change Research and Policy-making: a SEARRIN LUCC Project

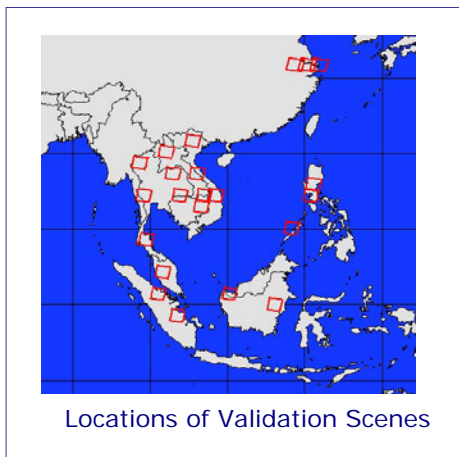
Project Leader: Dr. David Skole

Email: skole@msu.edu

Funding: US\$ 117,500 for two years

Participating Countries: Cambodia, Lao P.D.R, Indonesia, Malaysia, Philippines, P. R. China, Thailand, the USA and Viet Nam

Summary: This project supported a series of activities centered on the application of remote sensing analysis of land use and land cover in Southeast Asia and the development of geospatial data and data products for environmental monitoring and management. The project has succeeded in building capacity of regional scientists, developing a set of land use and land cover data products, developing on-line data portals using state-of-the-art web-GIS technologies, and developing an institutional linkage between data producers (MSU/SEARRIN scientists) and data users (policy-makers and natural resource managers) through collaboration with the Mekong River Commission Secretariat. The results from this APN-funded project are not, however, a single, one-time project. The progress made under this project is on going and marks an important milestone in SEARRIN LUCC achievements. Further data products are required if we are to meet the demands of the end user community. The researchers and co-investigators who participated in this project have established a protocol for monitoring forest cover changes and degradation, and plan to continue providing data products and information to the MRC and the LUCC community at large through the mechanisms established under this project. In addition, there are plans to submit a number of papers for peer review publication, as a result of the efforts supported by this APN project.



Papers to be submitted for peer-review:

- National park efficacy: A study of Tam Dao National Park, Viet Nam.
- Forest-Fallow-Farm: Land cover dynamics in the uplands of Laos.
- The mangroves of Southern Viet Nam: What does the historic Landsat archive reveal?
- Mekong River Forest Cover Assessment: Towards a common definition and protocol.

APN2004-05CMY-Reid: Building Local Capacity for Global Change Research: The Millennium Ecosystem Assessment Sub-Global Activities in the Asia-Pacific Region

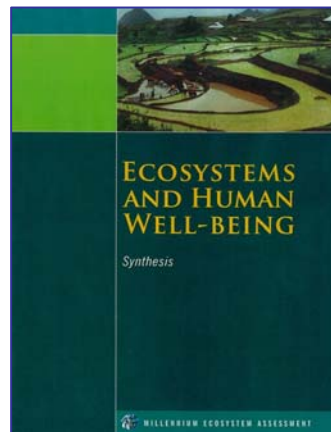
Project Leader: Dr. Walter Reid

Email: reid@millenniumassessment.org

Funding: US\$ 48,600 for two years

Participating Countries: Australia, Fiji, India, Indonesia, Malaysia, Papua New Guinea, Philippines, P. R. China, Thailand and Viet Nam

Summary: In March 2005, findings from the largest and most authoritative assessment of the connections between ecosystem health and human well-being, the Millennium Ecosystem Assessment (MA), were released. Central to the MA's success was a set of 'sub-global assessments' conducted at scales ranging from local communities to multi-country regions. These sub-global assessments, in locations in the Asia-Pacific and worldwide, were undertaken as part of the MA, together with the global assessment. APN funds were used to increase the participation of Asian-Pacific researchers in two core activities: *a workshop on modeling and scenario building*, and *meetings of the MA Sub-global Working Group*. The MA sub-global assessments were an experiment in applying the MA conceptual framework on the ground in varied locations and circumstances worldwide. In some contexts, complementary conceptual frameworks were also needed to capture the complex and dynamic nature of interactions between ecosystems and



humans. Multi-scale assessments also face additional challenges related to analytical approaches and stakeholder involvement. As such, these assessments are resource-intensive and time-intensive, and adequate expertise, leadership, funding and time are needed to ensure success; not all of the MA sub-global assessments have been completed, although this was recognized from early in the process and was factored into the MA design. Better geographical coverage and representation of ecosystems could have been achieved, but this was weighed against the benefits of greater innovation, diversity and user demand from a bottom-up selection process for assessments. Overall, the MA sub-global assessments have catalyzed the development of new tools and methodologies, and have provided information for better decision-making on sustainable management of ecosystems for human well-being. The intangible results, primarily related to capacity building, have been important as well, complemented by the network of institutions and researchers developed during the course of the MA.

Publications:

- Institute of Geography, 2005: *Downstream Mekong River Wetlands Ecosystem Assessment: Synthetic Report*.
- Institute of Geography, Vietnamese Academy of Science and Technology, Hanoi, 227pp. Kementerian Lingkungan Hidup, 2004: *Conditions and Trends of the Jakarta Bay and the Bunaken National Park Ecosystems – Indonesia*.
- Deputi Pelestarian Lingkungan, Kemenerian Lingkungan Hidup, Jakarta, 50pp. Lasco, R.D., M.V.O. Espaldon, M.A. Tapia, 2005: *Ecosystems and People: The Philippine Millennium Ecosystem Assessment (MA) Sub-global Assessment – Synthesis Report*. Environmental Forestry Programme, College of Forestry and Natural Resources, University of the Philippines Los Banos, 34pp.
- Liu, J.Y., T.X. Yue, H.B. Ju, Q. Wang and X.B. Li, eds., 2005: *Integrated Ecosystem Assessment of Western China*. China Meteorological Press, Beijing, 120pp.
- Millennium Ecosystem Assessment, 2005: *Multiscale Assessments: Findings of the Sub-global Assessments Working Group*. Ecosystems and Human Well-being, vol. 4. Island Press, Washington, DC.

APN2004-06CMY-Chen: The Mega-Deltas of Asia: A Conceptual Model and its Application to Future Delta Vulnerability

Project Leader: Prof. Zhongyuan Chen

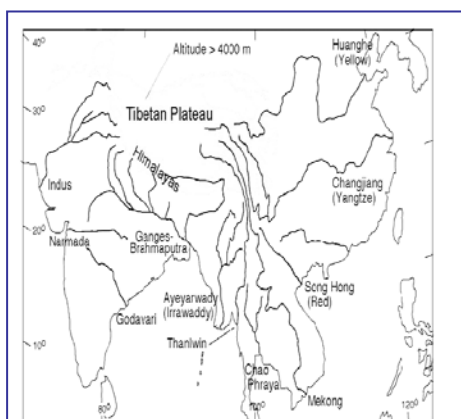
Email: Z.Chen@sklec.ecnu.edu.cn

Funding: US\$ 68,537 for two years

Participating Countries: Australia, Bangladesh, Cambodia, Canada, Finland, France, India, Iran, Japan, Pakistan, P.R. China, Singapore, Sri Lanka, Thailand, the UK, the USA and Viet Nam

Summary: The main objective of this project was to establish capacity-building networks among fluvial and coastal specialists of the Asia-Pacific region, especially those from developing countries. Through the project, we have approached: (1) establishing a comprehensive conceptual model for Asian Megadeltas where unique geologic conditions play a critical role for delta response to natural and anthropogenic forcing; (2) an improved understanding of the dynamic responses to human activities, natural variability, and global climate change, in order to provide useful information for future coastal vulnerability assessments; and (3) the significance of (1) and (2) for the sustainable development of this densely-populated region.

During the project implementation years, over 100 earth scientists from 23 countries, mostly from the Asia-Pacific region, of which 11 from developing countries participated actively and contributed significant knowledge to all who have been largely benefited. Also, a great output of the project is the four capacity networks created in East Asia, Southeast Asia, South Asia, and Oceania, particularly for those from developing countries. This has certainly provided a healthy and effective venue for involved scientists and policy-makers/government administrators, to address all necessities related to delta models and coastal vulnerability. This will exert long-term effectiveness for upgrading public awareness of environmental conservation, leading to sustainable development strategies in the near future. This project has served as a vital base for regional collaboration on delta-coast environmental conservation,



Distribution of Megadeltas in Asia

presently and in the future. An IGCP Project 475 - *Deltas in the Monsoon Asia-Pacific Region (DeltaMAP)*, was closely associated with the APN Megadeltas project. This UNESCO funded project has similar objectives to the APN project and has largely promoted the success of the APN project.

Publications:

- Woodroff, C, D., Chen, Z., Goodbred, S., Nichols, R.J., and Saito, Y., 2005. Landscape Variability and the Response of Asian Megadeltas to Environmental Change. *Global Environmental Change* (in review).
- Yu, F., Chen, Z., Ren, X., and Yang, G., 2005. Historical Flood Analysis of the Yangtze River, China: Characteristics, Formation and Consequence (Catena, in press).
- Chen, J., Chen, Z., Xu, KQ, Wei, T.Y., Li, M.T., Wang, Z.H., and Watanabe M. 2005. ADP-Flow Velocity Profile to Interpret Hydromorphological Features of China's Yangtze Three-Gorges Valley. *Chinese Science Bulletin*, 50, 464-468 (in Chinese, with English summary).
- Xu, K., Chen, Z., Zhang, J., Hayashi, S., Watanabe M., 2005. Simulated Sediment Flux of 1998 Big Flood of Yangtze (Changjiang) River, China. *Journal of Hydrology*, xx-xxx, 1-13.
- Chen, Z., Wang, Z., Schneiderman, J., Tao, J., and Cai, Y.L., 2005. Holocene Climate Fluctuations in the Yangtze Delta of Eastern China: the Neolithic Response. *The Holocene*. 15 (6), 917-926.
- Wang, Z., Saito, Y., Hori, K., Kitamura, A., and Chen, Z. 2005. Highly Laminated Sediments from a Transitional Zone between the Subaqueous Yangtze Delta and the Offshore Continental Shelf, China. *Estuarine, Coastal and Shelf Science* 62, 161168.
- Wang, Z., Chen, Z., Okamura, K., Gao, J., Xu, K.Q., Koshikawa H., and Watanabe, M., 2004. Anomalous current recorded at lower low water off the Changjiang Rivermouth, China. *Geo-Marine Letters*, 24, 252-258.
- Chen, Z., Saito, Y., Kanai, Y., Wei, T., Li, L., Yao, H., 2004. Low Heavy Metal Concentration in the Yangtze Estuarine Sediment, China: A Diluting Setting. *Estuarine, Coastal and Shelf Science*, 60, 91-100.

APN2004-07CMY-Lasco: Integrating Carbon Management into Development Strategies of Cities – Establishing a Network of Case Studies of Urbanisation in the Asia-Pacific

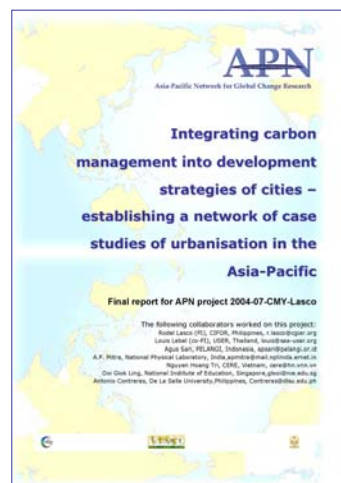
Project Leaders: Dr. Rodel Lasco and Dr. Louis Lebel

Email: rlasco@cgjar.org, louis@sea-user.org

Funding: US\$ 60,000 for two years

Participating Countries: India, Indonesia, Thailand, Philippines, Singapore and Viet Nam

Summary: The way urbanization unfolds will have a profound implication for future growth in energy use and emissions and, consequently, global environmental change. Cities offer many potential environmental protection benefits, arising from efficiencies in transport, energy used in cooling and heating, as well as opportunities to sequester additional carbon on land release from use by denser human settlements. On the other hand, cities have often been centres of wasteful consumption and serious air pollution problems. This project drew on past and on-going research efforts on emissions and urban management in Asia to establish a new set of coordinated case studies of New Delhi, Jakarta, Manila, Ho Chi Minh City and Chiang Mai. This group now collaborates under the label **U-TURN**, or the *Urban Transformation and Urbanization Research Network*.



A protocol for urban carbon management research was developed, explored and revised through applications in these five cities with their different constraints of data, prior research and political systems. Overall, the project achieved its three main initial objectives: to establish a network, develop a protocol, and provide guidance to a longer-term research programme. In addition, it hinted at several new key areas where research in urban areas could contribute to better understanding of, and actions in response to, global environment change. The activity was successful in raising awareness about urbanization's role in the global carbon cycle, and in the sense of proof-of-concept in developing a more integrative protocol. To go much further into urban planning and practice, however, would require substantially greater human resources and funds both for

inventory work, sectorial and more integrative policy analyses, and creating fora to deliberate regional and municipal development strategies.

Publications:

- Contreras, A., G.I. Ooi, and L. Lebel. 2005. Integrating carbon management into urban development in Asia: a preliminary synthesis.
- USER Working Paper WP-2005-06. Unit for Social and Environmental Research, Chiang Mai University, Chiang Mai.
- Lebel, L. (in prep.). Urbanization and the Carbon Cycle. Invited Editorial. *Global Environmental Change*.
- Lebel, L., J. Manuta, P. Garden, D. Totrakool, and D. Huasai. 2004. A carbon's eye view of urbanization in Chiang Mai: improving local air quality and global climate protection. USER Working Paper WP-2004-09. Unit for Social and Environmental Research, Chiang Mai University, Chiang Mai.
- Lasco, R., F. Pulhin, and R. Banaticla. 2005. Integrating carbon management in the development of Metro Manila-Laguna Lake basin, Philippines. USER Working Paper WP-2005-02. Unit for Social and Environmental Research, Chiang Mai University, Chiang Mai.
- Mitra, A.P., Charma, C, Pundir R. (*in review*). Emission of pollutants from transport sector in Indian Mega-cities: case studies of Delhi and Kolkata. (*Submitted to Atmospheric Environment*).
- Mitra, A. P., and C. Sharma. 2005. Integrating carbon management into the development strategies of cities: Delhi case study. USER Working Paper WP-2005-03. Unit for Social and Environmental Research, Chiang Mai University, Chiang Mai.
- Sari, A., and N. Salim. 2005. Carbon and the city: carbon pathways and decarbonization opportunities in greater Jakarta, Indonesia. USER Working Paper WP-2005-04. Unit for Social and Environmental Research, Chiang Mai University, Chiang Mai.
- Tri, N. H., P. T. A. Chau, N. K. Thanh, P. Duc, P. T. N. Diep, and N. T. B. Ha. 2005. Integrating carbon management into the development strategies of cities: Ho Chi Minh City and surrounds. USER Working Paper WP-2005-05. Unit for Social and Environmental Research, Chiang Mai University, Chiang Mai.

APN2004-08NSY-Uematsu: SOLAS Science 2004 - Travel Fund for Young Scientists

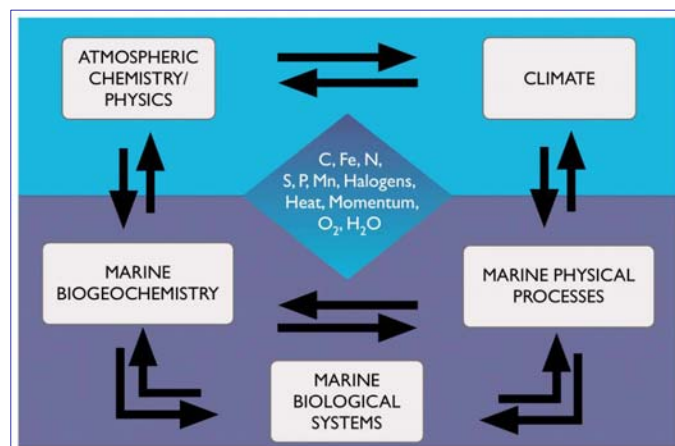
Project Leader: Dr. Mitsuo Uematsu

Email: uematsu@ori.u-tokyo.ac.jp

Funding: US\$ 20,000 for one year

Participating Countries: Global activity, APN funds supported Asia-Pacific attendance.

Summary: SOLAS is an IGBP core project that has as its goal: to achieve quantitative understanding of the key biogeochemical-physical interactions and feedbacks between the ocean and the atmosphere, and how this coupled system affects and is affected by climate and environmental change. SOLAS Science 2004 was the first international conference to present the results of the project. It was held in Halifax, Nova Scotia, Canada from 13-16 October 2004. The event was attended by 222 participants from 24 countries. The aim of the conference was to provide an opportunity for building multi/inter-disciplinary 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. The APN travel fund enabled eight young researchers to attend the conference for the mutual exchange of research and ideas within the international SOLAS community. The young scientists reported that the conference expanded their background knowledge, generated new ideas in their studies, evolved sound partnerships and contact networks; filled the gaps between their own and other's research; allowed comparison of research methodologies and ideas; and exposed them to new results and field 'hotspots'. Further SOLAS Science conferences are planned to take place on a biennial basis. The next conference will be in Xiamen, China, 6-9 March 2007.



Publications:

- Conference Handbook
- Conference proceedings in SOLAS News: Science highlights from the conference, and reports from the discussion sessions were summarized and published in the first edition of SOLAS News, in January 2005.
- Plenary talks on SOLAS web

APN2004-15NSY-Xu: Fourth IHDP Workshop - Globalization and Food Systems: a Global Environmental Change Perspective

Project Leader: Dr. Jianchu Xu

Email: xujc@ms.kmb.ac.cn

Funding: US\$ 15,000 for one year

Participating Countries: Global activity, APN funds supported Asia-Pacific attendance.

Summary: The Fourth International Human Dimensions Workshop (IHDW), officially titled the 'IHDP-IAI Global Environmental Change Institute on Globalization and Food Systems, Scientific Workshop and Science-Policy Forum' took place from October 24 to November 6, 2005, in Costa Rica. It was the first time that IHDP organized its biennial capacity-building event in close collaboration with a regional agency – IAI, and within a less developed country. Over the course of the two weeks, 25 international participants were introduced to general concepts of global environmental change, globalization and food systems. The Institute concluded with a Science-Policy Forum in which, in addition to the participants of the workshop, 75 representatives from the regional science and policy community participated. The Science-Policy Forum concentrated on a dialogue about the specific problems of Food Systems in Central America.



The capacity building institute focusing on global environmental change, food systems and globalization, was composed of two main components: a scientific workshop, which was held over 13 days, and a Science-Policy Forum, which was held on the

penultimate day of the workshop. In a competitive international selection process, 25 young scientists and policy- and decision-makers from 22 countries in Africa, Asia, Eastern Europe and Latin America were selected. During the course of the workshop they were introduced to general concepts of global environmental change, globalization and food systems.

The Science-Policy Forum at the end of the workshop was attended by all the international workshop participants, in addition to about 70 representatives from the regional science and policy community. It was opened by the Minister for Science and Technology of Costa Rica and concentrated on a dialogue about the specific problems of food systems in Central America. Focus was placed on the science-policy interface and use of scientific information in processes of policy-making and decision-making.

The organizers of the workshop were able to identify high-level participants. The workshop was very successful in creating enthusiasm and interest in human dimensions themes and IHDP projects. The future will show whether participants were able to integrate the new knowledge and networks into their own work. It will be very important to offer future possibilities for further involvement with the GEC community.

Publications:

- IHDP Proceedings No.7: IHDP/IAI 2004 Global Environmental Change Institute. "Global Environment Change, Globalization and Food Systems: Intersections and Interactions 24 October – 6 November 2004," September, 2005.
 - Science-Policy Form Proceedings: "Global Environment Change, Globalization and Food Systems – 6 November 2004," 2005.
-

APN2004-16NSY-Taniguchi: Groundwater Discharge as an Important Land-Sea Pathway in Southeast Asia

Project Leader: Makoto Taniguchi

Email: makoto@chikyu.ac.jp

Funding: US\$ 45,000 for one year

Participating Countries: Japan, Philippines, Russian Federation, Thailand and the USA

Summary: Any water quality and associated problems influencing coastal environments around the world today are related to past and on-going contamination of terrestrial groundwater because this groundwater is now seeping out along many shorelines. For example, chronic inputs of fertilizers and sewage on land over several decades has resulted in higher groundwater nitrogen which, because of slow yet persistent discharge along the coast, eventually results in coastal marine eutrophication. Such inputs may thus contribute to the increased occurrences of coastal hypoxia, nuisance algal blooms, and associated ecosystem consequences. As the main research component of this APN project, direct measurements of groundwater discharge into Manila Bay, Philippines, by a variety of methods have been initiated. These studies, which engaged scientists from several APN countries, will form a base for more extensive research throughout the Southeast Asian region.

Three lines of seepage meters were installed in transects along the coast at Mariveles, Bataan Province, Philippines during the period 8-10 January 2005. The seepage rates along the northern most line showed the highest submarine groundwater discharge (SGD) at rates of 7.1-10.9 cm day^{-1} . Additional methodologies employed during fieldwork included automatic seepage meters, resistivity measurements, and the use of natural radon as a groundwater tracer. Another outcome of this project concerned the organization of a regional workshop concerning groundwater discharge into Southeast Asian seas, as well as the resulting coastal management implications.

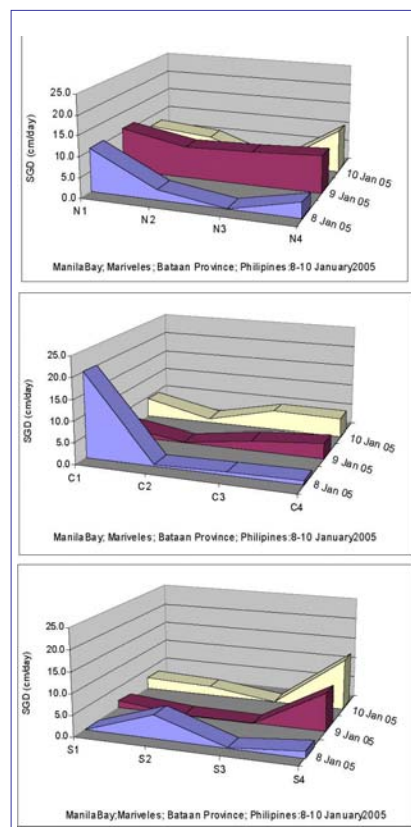


Figure: The seepage rate summaries for north (top), central, and southern (bottom) transect lines established off the Bataan Peninsula, 8-10 January 2005.

Figure: Manual seepage meters prepared at National Institute of Geological Sciences, University of the Philippines) specifically for this study.



Publications pending:

Taniguchi, M, W C. Burnett, H. Dulaiova, F, Siringan, J. Foronda, G. Wattayakorn, S. Rungsupa, E. A. Kontar, and T. Ishitobi (2006): Groundwater Discharge as an Important Land-Sea Pathway into Manila Bay, the Philippines. *J. Coastal Research* (submitted for publication).

Burnett, W.C., G. Wattayakorn, M. Taniguchi, H. Dulaiova, P. Sojisuporn, S. Rungsupa (2006): Groundwater-derived nutrient inputs to the upper Gulf of Thailand. *Estuaries* (submitted for publication).

APN2004-17NSY-Gadgil: Climate Prediction and Agriculture: An Assessment and Perspective

Project Leader: Prof. S. Gadgil and Dr. J. Hansen

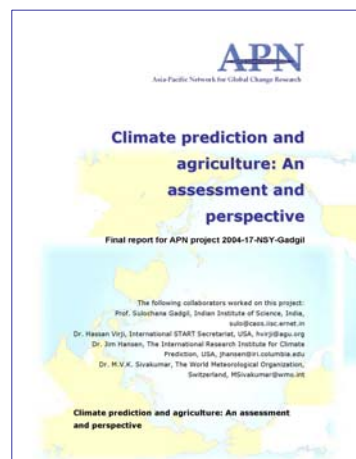
Email: sulo@cas.iisc.ernet.in

Funding: US\$ 15,000 for one year

Participating Countries: Global activity, APN funds supported Asia-Pacific attendance.

Summary: The second International Workshop on Climate Prediction and Agriculture was held at the World Meteorological Organization's (WMO) headquarters in Geneva, Switzerland from 11-13 May 2005. Participants at the workshop reviewed the advances in application of seasonal climate prediction to improve agricultural production, and identified issues and challenges to be addressed in the next five to ten years to operationalize the use of seasonal and intra-seasonal forecasts of climate variability in developing countries. During the workshop, experts in seasonal forecasting, applications to agriculture and leading socio-economists presented keynote review papers. Working groups engaged participants in discussions on the needs for future research, capacity-building, and future collaboration and coordination between various major organizations involved in climate prediction and applications to agriculture.

A major accomplishment of the workshop was the state-of-the-art review and assessment of the application of forecasts of seasonal and intra-seasonal climate variability to agriculture production. The review, to be published in the peer-reviewed journal "Climatic Research", will include papers on advances in seasonal climate forecasts, prediction 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 identified the gaps in knowledge, tools and methodologies, capacity building priorities and institutional needs for the future. The workshop also considered potential applications of climate science to other sectors, such as water resource management. In total, 49 participants from 22 countries attended. Experts presented papers and participated in discussions that led to recommendations on future efforts in the field for all



organizations involved in climate prediction and applications in agriculture. The workshop recommendations, if implemented, could pave the way to operationalizing the use of climate information in agricultural decision-making. The workshop engaged a number of senior and leading scientists and a group of young scientists from developing countries into a network of collaborating partners. There is great potential for future work in terms of both climate and agriculture related research and capacity building. During the workshop working groups assessed and prioritized strategic gaps in knowledge, methodology and implementation; and proposed a way forward to enhance knowledge, methodology, awareness, integration, training/capacity-building and institutionalization. It was decided that work needs to be done to strengthen networking and institutional partnerships, and capacity-building at all levels from forecasting and research to intermediaries at the farm level, especially in developing countries.

Publications pending:

- Special issue in the journal of "Climate Research" Journal, which will include all the keynote papers presented at the workshop.
 - A book entitled "Climate Prediction and Agriculture: Advances and Challenges" which will have extended abstracts of keynote papers and full papers of the presentations in the International Workshop on Climate Prediction and Agriculture and all the papers presented at the Synthesis Workshop for the Advanced Institute on Climate Variability and Food Security. Springer has agreed to publish.
 - A brochure on "Climate Prediction and Agriculture" meant for a wider audience based on the book.
-

CAPaBLE

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

APN2004-CB04CMY-Naito: Capacity Building on Climate Change and Locally-owned Technology and Systems

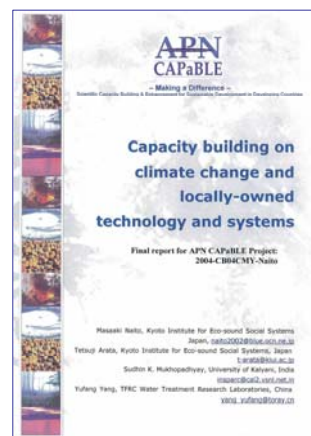
Project Leader: Dr. Masaaki Naito

Email: naito2002@blue.ocn.ne.jp

Funding: US\$ 80,000 over two years

Participating Countries: India, Japan and P.R. China

Summary: Mitigation of greenhouse gas emissions to combat climate change continues to have high priority under the provisions of the UNFCCC and its Kyoto protocol, as climate change could endanger the future well-being of humans, ecosystems and economic progress in all regions. All countries, taking into account their common but differentiated responsibilities, should continue to advance the implementation of their commitments under the Convention to address climate change. Technology transfer should be strengthened as much as possible via means such as concrete projects and capacity building in all relevant sectors. With this in mind, the present project focused on capacity building in climate change mitigation with locally owned technology. Information on locally owned technologies beneficial for climate change mitigation was collected from the Asia-Pacific region. Two meetings were then held in 2003, in Tianjin, China and Kalyani, India, respectively, to exchange and share information, to select good examples of appropriate technology and to discuss effective ways to promote technical transfer. During the second year of the project, a symposium and a workshop were organized in Hyogo and Kyoto prefectures, Japan in November 2004 to exchange and share information among scholars and experts from local governments and NGOs. The technologies discussed were considered earth- and user-friendly technologies matched to the scale of community life and



also defined as intermediate technology by Dr. Ernst Friedrich Schumacher. In spite of challenges anticipated in the beginning, this project successfully addressed locally owned technology and systems particularly through the gathering of information in China and India in 2003.

The symposia organized in Hyogo and Kyoto prefectures in 2004, were well accepted by the local public and international participants, and the workshop which followed deepened discussions among scholars and experts on locally-owned technology for climate change mitigation. In light of the Kyoto Protocol, which entered into force in February 2005, this project was conducted in a timely manner to promote due consideration of Asian countries in undertaking measures for climate change mitigation. In light of the growing strength of global environmental constraints in the decision-making process, the Project Leader will address further mid and long-term development scenarios for local communities, through locally-owned technology and systems, with the aim of contributing to a sustainable society. It is also expected that the present project report will be disseminated to the global change communities, such as IHDP, for their attention on sustainable measures for climate change mitigation particularly in developing countries.



Figure: SODIS utilizes PET bottles and sunlight for drinking water disinfection.



Figure: SODIS: PET bottles on the roof

Publications:

A final report will be published in print and electronic form (CD-ROM). Publication of a book (initially Japanese language only) based on the papers and discussion of the symposium/workshop is also in progress and will be published within a year.

APN2003-CB07-Muhammed: National Capacity Building Workshops on Global Change Research, Islamabad, Pakistan, June 8-10 2004; April 28-30, 2005.

Project Leader: Dr. Amir Muhammed
Email: amir.muhammed@nu.edu.pk
Funding: US\$ 20,000 for two years
Participating Country: Pakistan

The two national workshops aimed at enabling mid-career Pakistani scientists to participate effectively in the area of Global Change (GC) Research and the APN process to award annual competitive research grants. However since Pakistan has no institutional mechanism to conduct research on GC issues, there is little awareness about the magnitude and importance of various GC phenomena. As a result, most of the project proposals submitted by Pakistani scientists in the past did not meet the basic requirements of APN proposals. The workshop was therefore designed to describe the perspective of GC, the existing international organizations engaged in GC research, the APN network and details of the APN annual regional call for proposals.



IGBP and APN meet with Dr. Ishfaq Ahmad, Special Adviser to the Prime Minister of Pakistan, June, 2004, Pakistan.

Following a general discussion of the whole GC perspective and the APN process, the participants were invited to state their "wish list" for APN projects. Project titles suggested by the participants were discussed from the point of their suitability for funding by the APN. In the break-out groups, participants were asked to complete APN research proposals on mock projects under the guidance of Drs. Stevenson, Steffen and Muhammed and were guided on the crucial aspects of the competitive process. Sharing their impressions about the workshop, especially the shortages and improvements for future similar workshops, the participants were generally enthusiastic about the whole process and agreed they had learnt the importance and urgency for studying the many ramifications of global change. Participants stated that the workshops will help a



Figure: APN Project recognized in local media.

great deal in the preparation of proposals for submission to the APN.

The main objective of the second workshop was to bring together Pakistani scientists doing research in any aspect of global change so that a research community could be organized who are well informed about the perspective and importance of global change research and the programs of the major international organizations; and the opportunities available for collaboration for the Pakistani scientists.

Global change, whether in the bio-physical environment or socio-economic and cultural aspects, eventually affects all inhabitants of the globe, especially in a world that has rapidly globalized. One of the most significant aspects of global change is the trend in global warming with its manifestations on various aspects of climate change in different regions of the world. The evidence for a definite trend in global warming is now overwhelming, at the global level, 1990s was the warmest decade, and 1998 was the warmest year. An unprecedented heat wave in Europe, in 2004, resulted in a large number of deaths, vastly increased and high intensity typhoons in the US in 2004, rapid melting of Himalayan glaciers and polar ice cap, and the recent prolonged and severe draught in Southern Pakistan and Western India, are all evidence for the definite trends in global warming and related climate changes. In our own region, the Monsoon season has been shifting both in intensity and time of on-set and duration, resulting in heavy losses to the national economies.

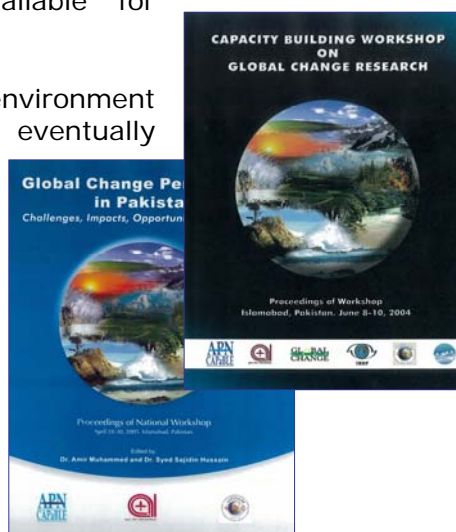


Figure:
Workshop
Proceedings

Peer-Reviewed Publications

In addition to the publications listed previously, a further nine peer-reviewed papers were also published in 2004/2005 as a result of the funding contributions provided by the APN.

APN Project: APN2001-16-Mosier/Cai

1. Zucong Cai et. al., Field validation of the DNDC model for greenhouse gas emissions in East Asian Cropping Systems, *Global Biogeochemical Cycles*, Vol.17, No.4, 1107, doi: 10.1029/2003GB002046, 2003.

2. Changsheng Li et. al., Modeling greenhouse gas emissions from rice-based production systems: Sensitivity and upscaling, *Global Biogeochemical Cycles*, Vol.18, GB1043, doi: 10.1029/2003GB002046, 2004.

APN Project: APN2002-02-Fu

3. Fu Congbin et. al., Streamflow Simulation for the Yellow River Basin Using RIEMS and LRM, *Advances in Atmospheric Sciences*, Vol. 20, No.3, PP.415-424, 2003.

4. Xiong Zhe et. al., Analysis of Simulated Heavy Rain over the Yangtze River Valley During 11-20 June 1998 Using RIEMS, *Advances in Atmospheric Sciences*, Vol. 20, No.5, PP.815-824, 2003.

5. Zhang Jingyong et. al., Impact of Land Cover Change in East China on Regional Water Balance, *Korean Journal of Atmospheric Sciences*, Vol.5, No.S, 2002.

6. Fu Congbin et. al., Regional Climate Model Intercomparison Project for Asia (RMIP), *Submitted to Bulletin of the American Meteorological Society*, Volume 86, No.2, 257-266, 2004 Society, December 2003.

APN Project: APN2002-07-Salinger

7. Salinger, J.S., et. al., Increasing Climate Variability and Change: Reducing the Vulnerability of Agriculture and Forestry, *Climatic Change*, Vol.70, Nos. 1-2, 2005.

APN Project: APN2003-03-Shrestha

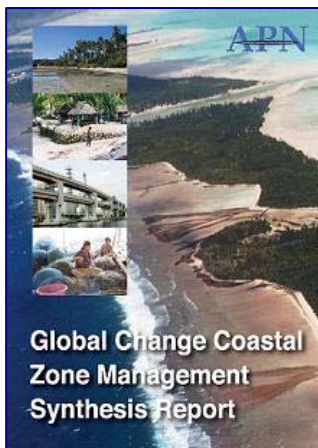
8. Shrestha Kedar Lal, Global Change Impact Assessment for Himalayan Mountain Regions for Environmental Management and Sustainable Development, *Global Environmental Research Vol. 9 No.1 69-81*, Association of Research Initiatives for Environmental Studies, 2005.

APN Project: APN2004-01CMY-Meinke

9. Selvaraju, Ramasamy, Impact of El-Nino Southern Oscillation on Indian Food Production, *International Journal on Climatology, Int.J.Climatol.23: 187-206 (2003)*.

10. Meinke, Holger and Stone, Roger, Seasonal and Inter-annual Climate Forecasting: The New Tool for Increasing Preparedness to Climate Variability and Changes in Agricultural Planning and Operations, *Climatic Change 70: 221-251, 2005*.

COASTAL ZONE SYNTHESIS



The Asia-Pacific Network for Global Change Research (APN), at its 8th Inter-Governmental Meeting (IGM), commissioned this APN Global Change Coastal Zone Management Synthesis Report to be prepared in time for its 10th anniversary in 2005. The report is the first output of a larger synthesis study, which will result in a more detailed scientific publication, in book form, scheduled for 2006.

The purpose of the synthesis project was to:

- evaluate achievements of APN coastal projects,
- review current coastal issues and research needs for the region,
- identify future coastal research directions for the region, and
- report results to the APN to assist with future policy directions.

The synthesis report demonstrates that since 1998, the APN has provided US\$ 750,000 in funding for twenty coastal research projects in the region. Of these, eleven projects had coastal issues as their main focus and nine projects dealt with the coast as a crosscutting theme. Two approaches were used to assess the achievements of these projects. First, an independent reviewer assessed the eleven core coastal projects against the six goals in the APN First Strategic Plan. Second, a group of international coastal experts conducted a separate review of all twenty coastal projects against the same goals.

A number of APN-funded projects stand out as successful and three examples of best practice projects are recorded in the synthesis report. It is important to note that many of these projects have achieved important outputs after APN funding ceased.

PUBLICATIONS AND COMMUNICATIONS

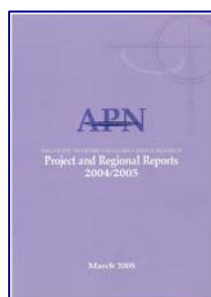
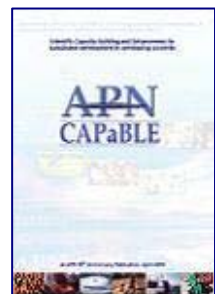
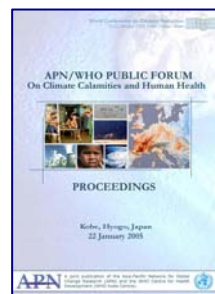
Communications and information dissemination is important to the APN in order to help achieve its goal of *“providing scientific input to policy decision-making and scientific knowledge to the public.”* In its efforts to realize this goal, the APN produces publications such as annual reports, brochures, newsletters, project reports, syntheses, and workshop reports. In addition to publications, the APN website is also used as a communication tool. It provides current information about its scientific and capacity building activities, funded projects, recent and past publications, and links to other members of the global change community.

APN Newsletter

The APN publishes a quarterly newsletter which features news from the Secretariat, APN supported projects, regional news, people in the APN and a calendar of events, which highlights particular events supported by the APN. In order to reduce the environmental and economical burden, it was decided to produce the newsletter in electronic format only. All issues of the APN newsletter are available for downloading in PDF format, in the “products” section on the website.

National and International Fora

The APN attends national and international meetings, conferences and workshops, relating to global change, to disseminate information about its activities as well as to learn more about what is going on in the global change community.



PEOPLE IN THE APN

The APN is made up of dedicated experts who play an active role in promoting the APN programme and its activities in their countries. Each member country appoints one national Focal Point (nFP), who sets policy for programmes, finances and other APN activities, and one Scientific Planning Group (SPG) member, who recommends science themes and activities for the IGM to consider for support.

The members listed below are current, at the time of publication, March 2006.

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Australian Antarctic Division*

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Ministry of Environment and
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CAMBODIA

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Ministry of Environment*

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SASCOM

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START-Oceania Regional Committee

TEACOM
Congbin FU
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APN Secretariat

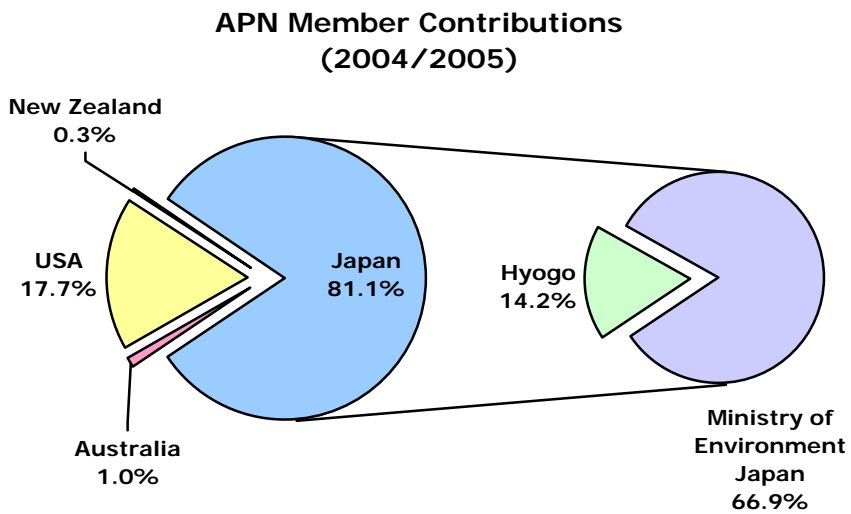
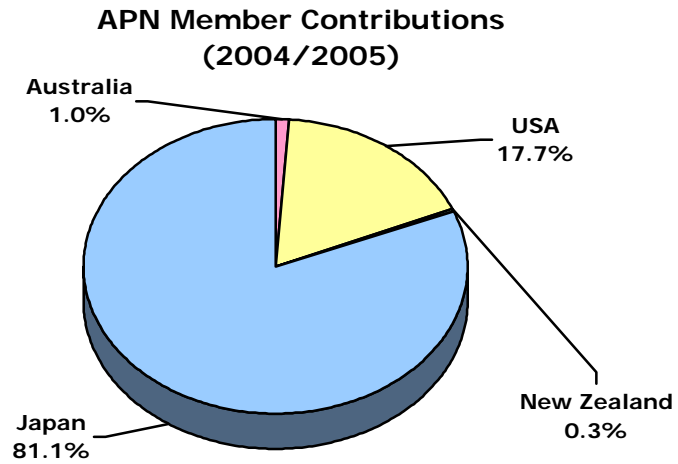
The Secretariat is located in Kobe, Japan under the support of Hyogo Prefecture, with a mandate to carry out the day-to-day operations of the network; provide secretariat support to the organs of the APN; and implement Inter-Governmental Meeting decisions.

The Secretariat listed below is current, at the time of publication, March 2006.

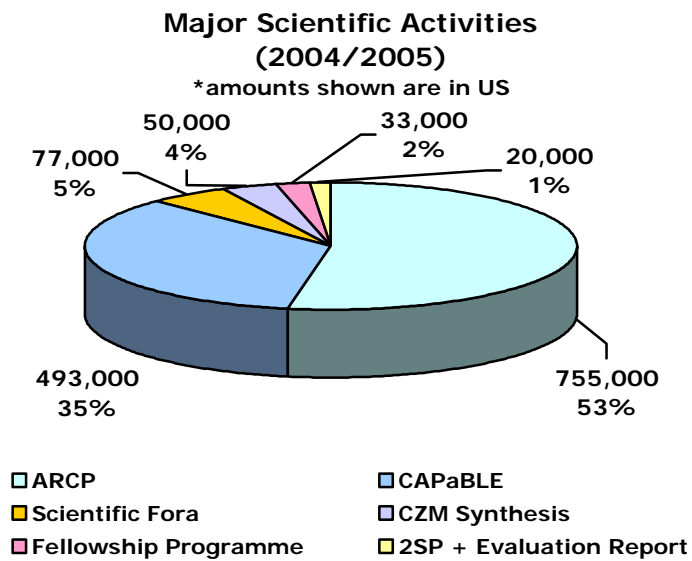
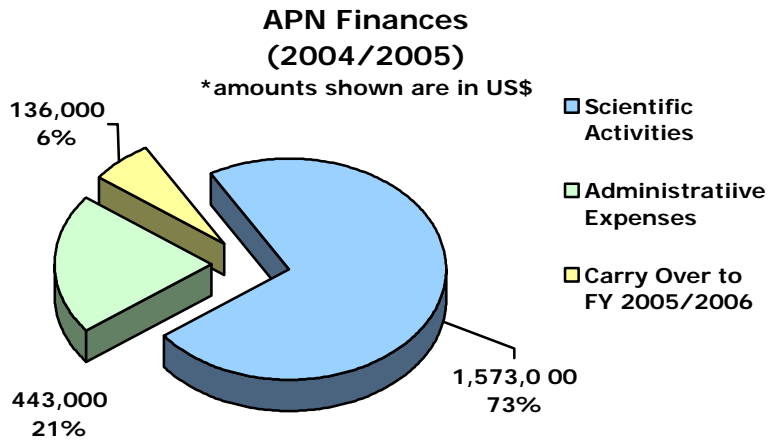


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APN Member Contributions 2004/2005



Finances Resources



MEMBER COUNTRIES AND SPONSORS

APN Member Countries

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

Australia, Bangladesh, Cambodia, China, Fiji, India, Indonesia, Japan, Lao People's Democratic Republic, Malaysia, Mongolia, Nepal, New Zealand, Pakistan, Philippines, Republic of Korea, Russian Federation, Sri Lanka, Thailand, United States of America and Viet Nam.

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ACRONYMS

Acronyms

APN	Asia-Pacific Network for Global Change Research
ARCP	Annual Regional Call for Proposals (APN)
ASCM	Augmented Steering Committee Meeting on Oct. 2004 (APN)
BHT	Bureau of Hydrology Tibet Autonomous Region
CAPaBLE	“Scientific Capacity Building and Enhancement for Sustainable Development in Developing Countries” programme (APN)
CAREERI	Cold and Arid Regions Environmental and Engineering Research Institute
CSKHPAU	CSK Himachal Pradesh Agricultural University
GLOFs	Glacial Lake Outburst Floods
IAI	Inter-American Institute for Global Change Research
ICIMOD	International Centre for Integrated Mountain Development
IGBP	International Geosphere-Biosphere Programme
IGES	Institute for Global Environmental Strategies
IGM	Inter-Governmental Meeting (APN)
IHDP	International Human Dimensions Programme on Global Environmental Change
LUCC	Land-Use and Land-Cover Change
MA	Millennium Ecosystem Assessment
MSU	Michigan State University
PARC	Pakistan Agricultural Research Council
SPG	Scientific Planning Group (APN)
SEARRIN	Southeast Asia Regional Research and Information Network
START	Global Change SysTem for Analysis, Research and Training
SODIS	Solar Water Disinfection
SOLAS	Surface Ocean-Lower Atmosphere Study
UNEP RRC-AP	United Nations Environment Programme Regional Centre for Asia and the Pacific
UNFCCC	United Nations Framework Convention on Climate Change
UNESCO	United Nations Educational Scientific and Cultural Organization
U-TURN	Urban Transformation and Urbanization Research Network
WHO	World Health Organization
WIHG	Wadia Institute of Himalayan Geology
WMO	World Meteorological Organization

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

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<i>Qualifications/Specialty</i>	
<i>Specific areas of interest relating to Global Environmental Change</i>	
<i>Name of Organisation</i>	<i>Designation/Position</i>
<i>Type of Organisation:</i> <input type="checkbox"/> Government Agencies <input type="checkbox"/> Educational Institutions <input type="checkbox"/> NGOs/NPOs <input type="checkbox"/> Private Foundations <input type="checkbox"/> Professional Societies <input type="checkbox"/> Others	
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