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Message from the Director

Highlighted in this late spring issue of the APN Newsletter is the APN annual Joint Inter-Governmental Meeting (IGM) and Scientific Planning Group (SPG) Meeting, which convened in Colombo, Sri Lanka, in early April 2011. We also report to you in this edition APN's work in the past quarter, as we continue to support the activities under our two pillars: the

Annual Regional Call for Research Proposals (ARCP) and the Scientific Capacity Development (CAPaBLE) programmes.

Let me express again my sincere gratitude to the Government of Sri Lanka and to the beautiful City of Colombo for hosting the Meetings, during which representatives reviewed the Network's achievements in the first year of its Third Strategic Plan (3SP) 5-year period, and identified new opportunities and challenges for the APN to implement its scientific and institutional agendas.

I am honoured to announce that this year's annual calls for proposals under the ARCP and CAPaBLE Programmes was officially launched on 26 May 2011. I encourage you to spread the message across your networks and we are excited to receive quality submissions of both research and capacity building proposals.

Please join me in welcoming three new Secretariat members who recently joined the APN, Mr. Masayuki Ishizu, Administrative Manager, Ms. Ratisya Radzi, Programme Fellow for Science and Institutional Affairs, and Mr. Xiaojun Deng, Programme Officer for Communications and Development. As our activities move on, I look forward to seeing closer communications and interaction between you, our readers, and the APN Secretariat.

A handwritten signature in black ink, which appears to read 'Tetsuro Fujitsuka'. The signature is written in a cursive, flowing style.

Tetsuro Fujitsuka

Director, APN Secretariat

Guest Article: Whither a Global Science-Society Synergy?

Chances and Risks for the UN's new Biodiversity and Ecosystem Services Assessment Platform

Photo: Ossi Petruska

Carmen Scherkenbach, IHDP Communications Associate

IHDP Executive Director Anantha Duraiappah was circumspect as he was preparing to travel to Nairobi to take part in the UNEP's Governing Council meeting late February, at which a mandate was expected to enable the formal establishment of the new Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES). IPBES, a global mechanism designed to provide directly needed assessment and policy guidance to help reverse the loss of biodiversity and ecosystems, was created in the mould of the Intergovernmental Panel on Climate Change (IPCC), an institution that, while broadly successful—its efforts earned it a Nobel Peace Prize, after all—could nonetheless be improved upon.

"We've got to go further [than the IPCC] in a few ways if we are to carry out the job given to us," says Duraiappah, citing the IPBES's orders as set out in the so-called Busan Outcome, named for the Republic of Korea City in which UNEP member states gathered to provide a blueprint for the platform. The IPBES should be more inclusive—academically and geographically—he says. In addition to a greater input from the social sciences, he hopes to see more scientists from southern areas taking part in the IPBES.

Duraiappah is one of the four leading scholars to articulate the chances and risks facing the IPBES in an article in *Science* published on 17 February, 2011. The article, by Charles Perrings of Arizona State University, Duraiappah, Anne Larigauderie of the Paris-based DIVERSITAS and Harold Mooney of Stanford University, concentrates on a number of areas, particularly that of policy. "The Busan Outcome imposes a greater obligation on the IPBES to support specific policies, with implications both for the way the governing body gives charges to scientists, and the way scientists carry out their work," the authors write. This means concentrating less on assessing notional scenarios developed in academic seclusion, and more on investigating the "consequences of specific policies implemented by governing bodies," and using scientific knowledge to inform and shape actual policy debates and decision-making at multiple levels. "Hypothetical scenarios bear no relationship to the real options confronting policy-makers now," says Perrings, a professor of environmental economics. "Discussions between decision-makers and scientists should start with the question 'What do governments want and what options do they have?' Knowing

the likely consequences of alternative policy options is critical to choosing the best strategy."

The call for a greater role for the social sciences is also, unsurprisingly, front and centre in the authors' recommendations. Socio-economic factors are enormously important in global environmental change, particularly changes to biodiversity and ecosystem services. Yet, very little interaction takes place at the international level between social scientists, natural scientists studying environmental changes, and policy-makers. The IPBES will be required to provide "quantitative projections of impacts of global change on biodiversity," note the authors. Yet the models needed for such projects "require a step-change in our capacity to model interactions between the socio-economic system and the biophysical environment." One way scientists have attempted to quantify biodiversity and ecosystem services is by internalizing their values into the macro economy—that is, calculating and assigning monetary values to the otherwise abstract ecological units. For example, economists recently estimated that an average hectare of coral reef provides services to humans valued at US\$130,000, and in some places as much as US\$1.2 million, per year. Such efforts can certainly go a long way in informing policy discussions, says Duraiappah. But it is not enough. "There are a myriad of factors that go into the policy and other processes that affect biodiversity and ecosystem services, especially in developing countries," he says. "Neither societies nor decision-makers act consistently or predictably as purely economically rational actors. Cultural factors play an enormous role in how societies perceive—and thus value—their environments." It is time to bring this wing of academia into the solution.

"For the IPBES to provide the policy support envisaged in the Busan Outcome it needs to answer questions that are meaningful to the nations that have brought it into being," write the authors in a concluding statement. This requires "a new approach" and an increased commitment from both science and society—one that Duraiappah believes amounts to nothing less than a "new social contract." The creation of the IPBES is wrought with risks, but is a unique opportunity to improve the way governments and societies the world over deal with environmental change. "It should not be wasted."

APN Convenes 16th IGM/SPG Meeting

APN's 16th Inter-Governmental Meeting (IGM)/Scientific Planning Group (SPG) Meeting and its associated meetings successfully convened at the Taj Samudra Hotel, Colombo, Sri Lanka from 4–8 April 2011. Hosted by the Ministry of Environment of Sri Lanka, the meeting brought together around 80 participants, including delegates from APN member countries, invited experts in the field of global change and representatives from key partner organizations, to discuss the activities to be supported by APN particularly from April 2011 to March 2012.

New members were welcomed at the Meeting which included eight new national Focal Points (nFPs) and two new SPG members.

In the ensuing discussion the IGM considered the APN Operating Plan for the 3rd Strategic Phase (3SP), which was devised to ensure the effective implementation of the activities outlined under the two main agendas of the 3SP, the Science Agenda and the Institutional Agenda. They also tackled strategies to further strengthen APN's resources development. It was acknowledged that there was in fact a substantial increase in APN revenue in the last seven years, thanks to those donors who have been continuously supporting APN activities.

The IGM approved the Final Financial Report for 2009–2010 and the Budget Plan for 2011–2012. The APN expressed its deep appreciation and gratitude to

the Ministry of the Environment Japan for their increased contribution, which supported the successful launch of two Special Calls for Proposals for Focused Activities in which seven new projects had been selected.

This year, the IGM approved 41 projects (continuing and new proposals) for funding under the Annual Regional Call for Research Proposals (ARCP) and the Scientific Capacity Development (CAPaBLE) Programmes. A number of proposed new and continuing activities were also endorsed:

1. Biodiversity Framework development based on a recent gap analysis workshop;
2. International Conference on Planet under Pressure;
3. Science-Policy Dialogue in Challenges of Global Change: Focusing on Southeast Asia (SEA);
4. Proposal Development Training Workshop (PDTW) at the Young LOICZ Forum; and
5. Three activities to be implemented in collaboration with the Hyogo Prefectural Government, Japan, namely:
 - a) Cooperation with Mongolia on Reforestation Project;
 - b) The 9th International Meeting on the Environmental Management of Enclosed Coastal Seas (EMECS 9); and

- c) APN-DIVERSITAS-HYOGO-IHDP-UNU: The New Commons in the Asia-Pacific Region.

The Climate Synthesis Team reported on the activities conducted to date and the timeline for synthesis completion, highlighting the two expected products: a synthesis report targeted for decision- and policy-makers scheduled to be released in June 2011, which covers 56 projects funded by the APN under both its ARCP and CAPaBLE Programmes; and an academic book largely consisting of peer-reviewed research papers. Maintaining the current timeframe of the Climate Synthesis, as the Team noted, is crucial in order to align with the timeframe of the Inter-Governmental Panel on Climate Change Fifth Assessment Report (IPCC AR5).

The APN will be implementing two new policies, one on data sharing and data management, and the other on reviewer conflict of interest. Regarding the data sharing and management policy, the APN will maintain a database accessible via the APN website that provides basic information, or metadata, on how to access data from an APN project or activity. The APN Secretariat will not be a data-centre or data storage hub but, rather, will provide information via the APN website on how APN-funded data can be acquired. This will be known as the APN Metadata Portal. Project leaders are encouraged to contact the APN Secretariat if they have any question or concern in





this regard.

The Meeting also continued its efforts in promoting sub-regional cooperation. The South Asia (SA) and Southeast Asia (SEA) Sub-Regional Committees (SRCs) had the opportunity to discuss relevant issues, future plans and activities at the sub-regional level. Representatives of both SRCs reported the results of their respective discussions to the IGM.

Guests and observers from the global change research community, particularly the Inter-American Institute for Global Change Research (IAI), the Climate Change, Agriculture and Food Security (CCFAS) and the Earth System Science Partnership (ESSP) were invited to present on current and future activities of their respective institutions, programmes and networks. The presentations highlighted strategies/approaches to further strengthen partnerships between the APN and the international global change research community.

A networking and informal dialogue session was organized where 16 young scientists from Sri Lanka showcased their research works through poster presentations. The best poster was chosen by APN members and was presented with the Mitra Award. The winner, Dr.

W.G.D. Lakmini from the Faculty of Agriculture, University of Ruhuna, Sri Lanka, was invited to deliver a presentation on her research work entitled "Plant Mediator to Tackle Climate Change".

On the second day of the main meeting, the host country arranged a half-day tour for the delegates to visit the Elephant Orphanage Pinnawala in Rambukkana. This is a conservation shelter for orphaned elephants found in the wild. The orphanage started with five baby elephants in 1975 and now the herd has more than 80 elephants. Since its establishment, 45 elephants were born in the orphanage.

The APN Secretariat would like to express its sincerest gratitude to the host, delegates, experts, representatives, and all others who made the 16th IGM/SPG meetings a huge success. The next IGM/SPG Meetings in 2012 will be hosted by the Government of Indonesia, which confirmed its willingness during the Sri Lanka meetings through the nFP for Indonesia.

New APN Publications



APN Science Bulletin

In this first issue of the APN Science Bulletin, all activities that were funded and undertaken by APN from April 2010 to March 2011 have been included.

Under featured articles, full scientific research papers have been written and cover a number of major themes in APN's science agenda.

Sections 2 and 3 look at the work conducted under APN's two main pillars of activities—the ARCP and CAPaBLE programmes, respectively.

Section 4 highlights projects funded through a special focused activity undertaken from 2009–2010 on Climate Change Impact and Vulnerability Assessments.

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International Symposium on Promoting Synergies among Adaptation Networks in the Asia-Pacific Region

The International Symposium on Promoting Synergies among Adaptation Networks in the Asia-Pacific Region concluded in Mito, Japan on 17 January 2011. The three-session Symposium was organized by the Institute for Global Change Adaptation Science (ICAS) at Ibaraki University and funded by the Environment Research and Technology Development Fund (S-8) of the Ministry of the Environment Japan (MOEJ).

As an effort to exchange information and experiences among existing adaptation networks in the Asia-Pacific region and around the world, the Symposium helped to identify ways to develop synergies among existing networks, which could lead to the formation of a "network of networks" that enables linking and consolidation of ideas and activities that will serve the following roles:

1. Help networks and institutions to focus on research priorities such as vulnerability assessments and to identify effective adaptation strategies (including technologies and policies) through a mutually agreeable index-based adaptation assessment system;
2. Provide a platform for various research institutions and development agencies to develop their adaptation tools in multiple geographical and social contexts, enabling the development of an array of research and development opportunities in various sectors of adaptation.

The APN was represented in the Symposium by Dr. Linda Anne Stevenson, Executive Science Officer of the APN Secretariat.

Symposium highlights

Session I: Science and Policies for Adaptation

The first session looked at the current state of climate change vulnerability in the Asia-Pacific region and around the world, the science and policy tools available for facilitating adaptation, and possible means to promote synergy among adaptation networks at different levels.

Professor Saleemul Huq from the International Institute of Environment and Development (IIED) gave a keynote lecture in this session by starting with a broad overview of the IPCC, followed by an explanation of the role of adaptation if we are to minimize global warming, given the irreversible damage done even if the world reduces emissions, as the global temperature is expected to increase by another 0.7°C in the next two decades, according to the IPCC AR4.

According to Professor Huq, countries gathered for the UNFCCC COP16 in Cancun in 2010 with lower and more realistic expectations, and the discussions led to the Cancun Agreement, in which an adaptation framework was included with a high-level adaptation committee, a result of a widespread agreement that adaptation needs to be dealt with at a higher policy level. In recognition of this, new funding is already flowing through various channels for both short-term and long-term tracks.

“ The APN was highlighted ..., showing the importance of the Network in this international endeavour, particularly for scientific capacity building.

As both the developed and developing countries are increasingly aware of the role adaptation plays as they realize their vulnerability to climate change impacts, decision-makers at all levels start to look at adaptation at a very practical perspective. Professor Huq shared in his lecture some of the possible means to maximize the synergy among actors at different levels.

1. Connecting with community-level actors

As community-level adaptation skills are not available in the science literature, knowledge from community-level actors can only be gained by connecting with them. In this context, a Community-Based Adaptation Conference in March looks at opportunities to scale-up adaptation activities and empower people to act by themselves. The catalysts, as Professor Huq stated, are outsiders like ourselves, who are to facilitate knowledge-sharing in the most timely and efficient manner.

2. Breaking disciplinary barriers in research

Professor Huq explained the barriers affecting synergy in a university setting and the lack of incentive to collaborate. He observed that knowledge cannot just come from academicians but must also come from practitioners.

To shape adaptation science in its evolution, a combination of doers (people on the ground) and learners (researchers in the academia) are needed to act in synergy. To this end, we will have to develop a huge learning curve, therefore collaborative research between different disciplines and between researchers and non-researchers is crucial.

3. Establishing multiple connections among existing networks

We need to bridge the scales of networks that operate at different levels from community to local, national, regional and global. The three most important elements in the short term, as Professor Huq put it, are capacity building, capacity building and capacity building: "Everyone has to be brought up to speed as quickly as possible. Doing is running ahead of learning and this is highly problematic," says Professor Huq.

In the context of community-based adaptation, the Fifth International Conference on Community-Based Adaptation to Climate Change (CBA5) was held from 24–31 March, in Dhaka, Bangladesh.

Session II: Identifying synergies among networks

Session Two of the Symposium looked at identifying means to promote synergies among existing adaptation networks by promoting research and development issues identified previously in Session One.

An overview of the Session was provided by Dr. S.V.R.K Prabhakar of the Institute of Global Environmental Strategies (IGES) based in Hayama, Japan. Dr. Prabhakar highlighted the present networks that conduct and share information on adaptation strategies in the Asia-Pacific region, including the APN, and APNAP (UNEP-ROAP), among others.

Dr. Kwangwoo Cho, APN's former Scientific Planning Group (SPG) Member for the Republic of Korea (ROK) introduced ROK's strategy on climate change adaptation including its green growth strategies, indicating that 2% of ROK's Gross Domestic Product (GDP) is being used to implement various national activities and programmes related to climate adaptation and green growth.

Following this, Dr. Srikantha Herath, Senior Academic Programme Officer of the United Nations University (UNU) and member of APN's Capacity Development Committee (CDC), presented on the recent initiative to form a network for climate and ecosystems in the higher education sector, in which 19 universities are currently participating, in the Asia-Pacific region utilizing the IR3S system.

Professor Rajib Shaw of Kyoto University, Japan discussed linking climate and disaster-related research and higher education by highlighting an example of the Asian University of Environment and Disaster Management (AUEDM), noting 25 institutions partnering in this endeavour. It is worth noting that the main collaborators in the AUEDM activities are current recipients of APN funds.

Dr. Makoto Tamura of ICAS, Ibaraki University, delivered his presentation on the framework to form an international (information) network of networks for climate adaptation.

The APN was highlighted in many of his slides showing the importance of the Network in this international endeavour, particularly for scientific capacity building. The global change programmes, the IPCC and START were also highlighted as being crucial to the region and to the success of the "network of networks". Dr. Tamura clarified the current state of adaptation policies, collecting information related to vulnerability assessments and adaptation. He noted the need for vulnerability assessments which are central to implementing successful adaptation strategies.

Dr. Tamura finished by asking everyone to complete the questionnaire provided, the result of which will be incorporated in

the design of an adaptation database for the Asia-Pacific region. To understand the synergies and to evaluate the activities and methodology, an adaptation database will be constructed and vulnerability assessments will be undertaken.

Responding to a question raised by Dr. Stevenson on how to avoid duplication of efforts, Dr. Tamura stressed the essentiality of communications and collaboration, and explained that the ICAS has some methodology in place to ensure the fullest cooperation of the networks involved, including the APN.

Discussion Session: How should we utilize the International Network for Adaptation?

Professor Nobuo Mimura, APN's former SPG Member for Japan, provided the basis for the discussion drawn from the keynote speeches and two sessions that had taken place. He identified five areas under the heading "Opportunities and Gaps for Adaptation," including:

1. Adaptation Planning and Implementation;
2. Research and Adaptation Science;
3. Education and Capacity Building;
4. Networking; and
5. Next Targets.

Professor Huq highlighted a new climate change journal in Nature from April 2011, noting that the publishers are looking for more products on adaptation, particularly synthesis and state-of-the-art activities. In this context, he suggested that an output from the present symposium could be a synthesis paper.

Professor Emeritus Kazuya Yasuhara reiterated the importance of attempting to combine traditional knowledge with advanced technology. He noted that it is worthy of consideration and could be perceived as a gap in existing adaptation strategies.

“ Training trainers and providing materials and tools would be an effective way to introduce adaptation strategies.

With respect to adaptation planning and implementation, the importance of communications was stressed, particularly in terms of raising civil society awareness and, following from this, securing governmental funding.

Language and terminology was also considered a barrier in understanding adaptation issues and this must be approached with sensitivity. "Promoting Synergies among Adaptation Networks" could be considered as the title for the "network of networks," particularly in terms of avoiding confusion whereby the latter may be misconstrued as another network duplicating the efforts of others.

Professor Shaw noted that engaging with "champion" countries, cities and practitioners would ensure the distribution and sharing of best practices. Furthermore, training trainers and providing materials and tools would be an effective way to introduce adaptation strategies.

APN Welcomes New SPG Member for Viet Nam



Please join the APN in welcoming its new Scientific Planning Group (SPG) Member for Viet Nam, Dr. Ngo Kim Chi, Head of Research and Development Department on Natural Resource Processing and Environmental Protection, Institute of Natural Products Chemistry, Vietnam Academy of Science and Technology.

We look forward to closely interacting with Dr. Ngo, and are confident this membership


change will continue to foster APN's strong relationship with the Vietnamese Government. For official correspondence, Dr. Ngo can be reached via email at chikimngo2@yahoo.com or chikimngo2008@gmail.com.

On behalf of the APN, the Secretariat extends its sincere gratitude to Ms. Mai Ngoc Bich Nga, Dr. Ngo's predecessor who joined the APN in 2004, for her continued support of APN's activities.

APN Project-Related Outputs

CBA2010-07NSY-Stone

Web-based 'Discussion-support' Agricultural-Climate Information for Regional India

 [Download final project report](#)
[Visit project website](#)


CIA2009-07-LOTIA

Capacity Development of the Scientific Community for Assessing the Health Impacts of Climate Change
Research Paper: Climate Change and Health—Exploring Linkages

 [Download PDF](#)


CBA2010-12NSY-Pradhananga

International Graduate Conference on Climate Change and People

 [Download final project report](#)


ARCP2009-01-Fukami

Flood Risk Management Demonstration Project (phase 1) under the Asian Water Cycle Initiative for the Global Earth Observation System of Systems (GEOSS)

 [Download final project report](#)


CBA2010-08NSY-Salinger

Addressing the Livelihood Crisis for Farmers: Weather and Climate Services for Sustainable Agriculture—Development of Tools

 [Download final project report](#)


ARCP2009-02-Okladnikov

Human Impact on Land-cover Changes in the Heart of Asia

 [Download final project report](#)

CBA2010-04NSY-Dhaka1

Carbon Governance in Asia: Bridging Scales and Disciplines

 [Download final project report](#)

CIA2009-05-Jitpraphai

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


 [Download final project report](#)

Photo: Bipin Gupta

Staff Changes in the APN Secretariat

Message from the Outgoing Programme Officer for Communications and Development

Perlyn Pulhin



Change is an essential part of everything! I used to commission articles for the APN Newsletter, asking for contributions, writing and editing articles, chasing contributors and pulling all things together. Now, I'm being asked to write a short note for the APN Newsletter readers for its coming edition. Is it my turn to be chased?

It has been almost two months since I left APN and I would like to thank the Secretariat for this opportunity to give a short message for the Newsletter subscribers. APN is like a family to me, having worked in the organization for almost five years. While I am sad to leave my job and my colleagues at the APN Secretariat, I do not want to outstay and I feel that it's the right time to move on while I still have the motivation to pursue further studies.

Inspired by what APN has achieved over the years and its network of scientists, government officials, researchers, and representatives from non-governmental and international organizations, I decided to advance my learning and pursue an MSc in Environmental Science. I believe this is the best way to complement my specialization in Development Communications in order to better contribute to a proper, efficient and more strategic way of managing the environment and natural resources towards sustainable development. Certainly, the experiences and knowledge that I gained from APN and all its members and partners will be of great help to me as I embark on another chapter in my life.

My memorable stay with APN and in Japan has truly been a capacity building experience for me, both professionally and personally and thank you very much to the Secretariat Director (and former Director) and members (and former members whom I have worked with), all the member country representatives and global change partners and colleagues and our dear subscribers for the support and for making my time at APN very meaningful and productive.

I will remember very fondly many workshops, meetings and other activities in various interesting places and always accompanied by the finest of company. Friends and colleagues, many thanks and see you all again in the future.

Secretariat Welcomes New Staff Members on Board



Masayuki Ishizu
Administrative Manager

I have been working in the Hyogo Prefectural Government for 16 years before joining the APN this April. Before that, I worked for a Japanese trading company. During this time I lived in Panama for about a year and in Venezuela for about two years. Because of such cross-cultural experiences, I consider myself sort of a "Latin-style Japanese".

When I switched from the private sector to the government, I suffered very strong culture shock. Now it's a shock to me again as it is the first time for me to take on administrative duties. Yet, I am excited to work with the talented, kind and unique colleagues here. I am very happy to be a member of the APN.

Hi there! My name is Ratisya Radzi and I'm the new Programme Fellow for Science and Institutional Affairs here at the APN Secretariat. I've recently arrived from Malaysia and this is my first time living in the Kansai area.



Ratisya Radzi
Programme Fellow for Science and Institutional Affairs

I did my degree in English Language and Literature Studies but ended up as a research officer in the Centre for Global Sustainability Studies at Universiti Sains Malaysia (Malaysia Science University) in Penang, Malaysia, which gave me my first exposure to the world of sustainable development.

My first few weeks with the APN have been very exciting and incredibly educational; everyone is so welcoming here. I know I will gain invaluable experience and I am looking forward to the rest of my time here with the APN. With that I'd like to say, "Hajimemashite. Yoroshiku onegaimasu!"

My name is Xiaojun Deng and I am succeeding Ms. Perlyn Pulhin as the Programme Officer for Communications and Development. I am excited to be part of the APN Secretariat and take on the new responsibilities.



Xiaojun Deng
Programme Officer for Communications and Development

I come from China and before joining the APN I worked as a consultant in the Division of Communications and Public Information, United Nations Environment Programme (UNEP) in Nairobi, Kenya, responsible for the Organization's Chinese website and social media networks, as well as internal communications with its Chinese partners.

It's a completely new and exciting experience to be working in the APN, and I look forward to gaining new knowledge and inspiring ideas through working with all of you in the APN family.

International Conference on Biodiversity and Climate Change

APN Partners Highlight Key Issues



Major APN partners shared knowledge and information on the two-way interactions of biodiversity and climate change and identified strategies and actions to conserve biodiversity at the International Conference on Biodiversity and Climate Change (ICBCC) held from 1–3 February 2011 in Manila, Philippines.

In this event jointly organized by the Philippines' Department of Environment and Natural Resources (DENR) and its Commission on Higher Education (CHED), experts, educators and donors were also offered a networking opportunity for future research and implementation of programmes on biodiversity conservation and climate change adaptation and mitigation.

APN's strong presence and involvement

APN's partners highlighted a number of key issues in a plenary session of the Conference, which was chaired by Marcial Amaro Jr., APN Scientific Planning Group (SPG) Member for the Philippines and Director, Ecosystems Research and Development Bureau (ERDB), DENR.

Dr. Linda Anne Stevenson, Executive Science Officer of the APN Secretariat, who was officially representing the APN at the Conference, met the DIVERSITAS Committee, including Chair Victor Amoroso, and discussed collaboration in the Asia-Pacific region for DIVERSITAS-related science activities.

Dr. Anne-Helene Prieur-Richard, Deputy Director of the International Programme of Biodiversity Science (DIVERSITAS), one of APN's key partners, explained the role of DIVERSITAS in moving biodiversity science closer to decision-making. She noted that the Programme promotes an integrative biodiversity science, linking biological, ecological and social disciplines in an effort to produce socially relevant new knowledge.

DIVERSITAS, as she went on to explain, also creates the scientific basis for the conservation and sustainable use of biodiversity, and provides government agencies and policy-makers with the information required to make sound decisions on biodiversity issues.

A presentation on the strategies for biodiversity conservation

in the ASEAN regions was given by Dr. Rodrigo Fuentes, Executive Director, ASEAN Centre for Biodiversity (ACB). The Centre facilitates cooperation and coordination among the ASEAN Member States and with relevant national government, regional and international organizations, on the conservation and sustainable use of biodiversity and the fair and equitable sharing of benefits arising from the use of such biodiversity in the ASEAN region.

Dr. Rodel Lasco of the APN Climate Synthesis Team, former project leader/collaborator and Philippines Programme Coordinator, ICRAF; and Mr. Samuel Peñafiel, former national Focal Point for the Philippines and Regional Executive Director, DENR, also attended the conference.

More about the ICBCC

Scheduled to coincide with the World Wetlands Day, the Conference brought together environmentalists, researchers, scientists, academicians, policy-makers and representatives from various related organizations at the local, regional and global levels, to share findings on correlations between biodiversity and climate change, to pinpoint knowledge gaps and explore collaborative research opportunities, and to identify strategies for mitigation and adaptation.

The Conference was organized by DENR and CHED in collaboration with the United Nations Development Programme (UNDP), the Philippine National Economic Development Authority (NEDA), DIVERSITAS, ACB, World Wildlife Fund (WWF), Commission on Climate Change (CCC), Protected Areas and Wildlife Bureau, the Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD) and the Philippine Council for Aquatic and Marine Resources Research and Development (PCAMRD).

Designing a New Initiative to Meet the Grand Challenges

APN Attends New Round of Earth System Visioning Meetings

The APN was represented by Mr. Tetsuro Fujitsuka, Director of the APN Secretariat, at the 3rd Earth System Visioning meeting held from 10–11 February 2011 at the Château de Montvillargenne in Paris, France.

Following the identification of the Grand Challenges in 2009 and the consideration of an institutional framework required to address these challenges in June 2010, the meeting aimed to start to design a new initiative that would mobilize the scientific community, funders, operational service providers and users to address the Grand Challenges and the related Belmont Challenge.

The meeting was organized by the International Council for Science (ICSU) in close cooperation with the International Social Science Council (ISSC) and the Belmont Forum, which represented the International Group of Funding Agencies for Global Change Research (IGFA).

Meeting participants comprised Chairs and Directors of the Global Environmental Change (GEC) programmes (DIVERSITAS, IGBP, IHDP, WCRP and their partnership ESSP, as well as START), representatives of affiliated or partner agencies (UNEP, WMO, IOC) and other co-sponsors of the GEC programmes, the APN and other regional networks, other international programmes and international experts in both natural and social sciences.

Framing the initiative

Stressing the urgency to find a new venue for science to respond effectively to societal needs, and to accelerate the delivery of the science-derived knowledge that society needs to address pressing environmental changes, the group expressed consensus on the importance of establishing a new Social Contract between Science and Society, with respect to designing the initiative, delivering its results, establishing and maintaining a fruitful dialogue with decision-makers, and investing in capacity building at all scales.

It was agreed in the meeting that, in order to establish such a sound contract, a set of fundamental needs should be addressed with a dedication to bring together distinct approaches to generating and using the knowledge of different disciplines.

The design criteria

The group pointed out a number of key design issues and criteria to ensure compliance with established criteria and the effective and efficient performance of the new initiative.

These criteria include the importance of co-designing, the need to build on current structures, the need to incorporate strong regional components; and the important role of the new generation of researchers, among others.

Goals

Human-induced global change is a threat to human society and well-being, but at the same time is creating new opportunities for innovation. In the next decade, the scientific community must deliver knowledge that will enable countries to meet their sustainable development needs.

It was agreed in the meeting that the envisaged initiative should respond to this challenge by:

- producing credible scientific knowledge and solutions that respond to the Grand Challenges in Earth System Research for Global Sustainability and to the Belmont Challenge; and
- effectively delivering this knowledge to all the relevant stakeholders in the society.

For a more detailed summary of the meeting, the full report is available at the following address: http://www.icsu-visioning.org/wp-content/uploads/Visioning_ThirdMeeting_Summary1.pdf.

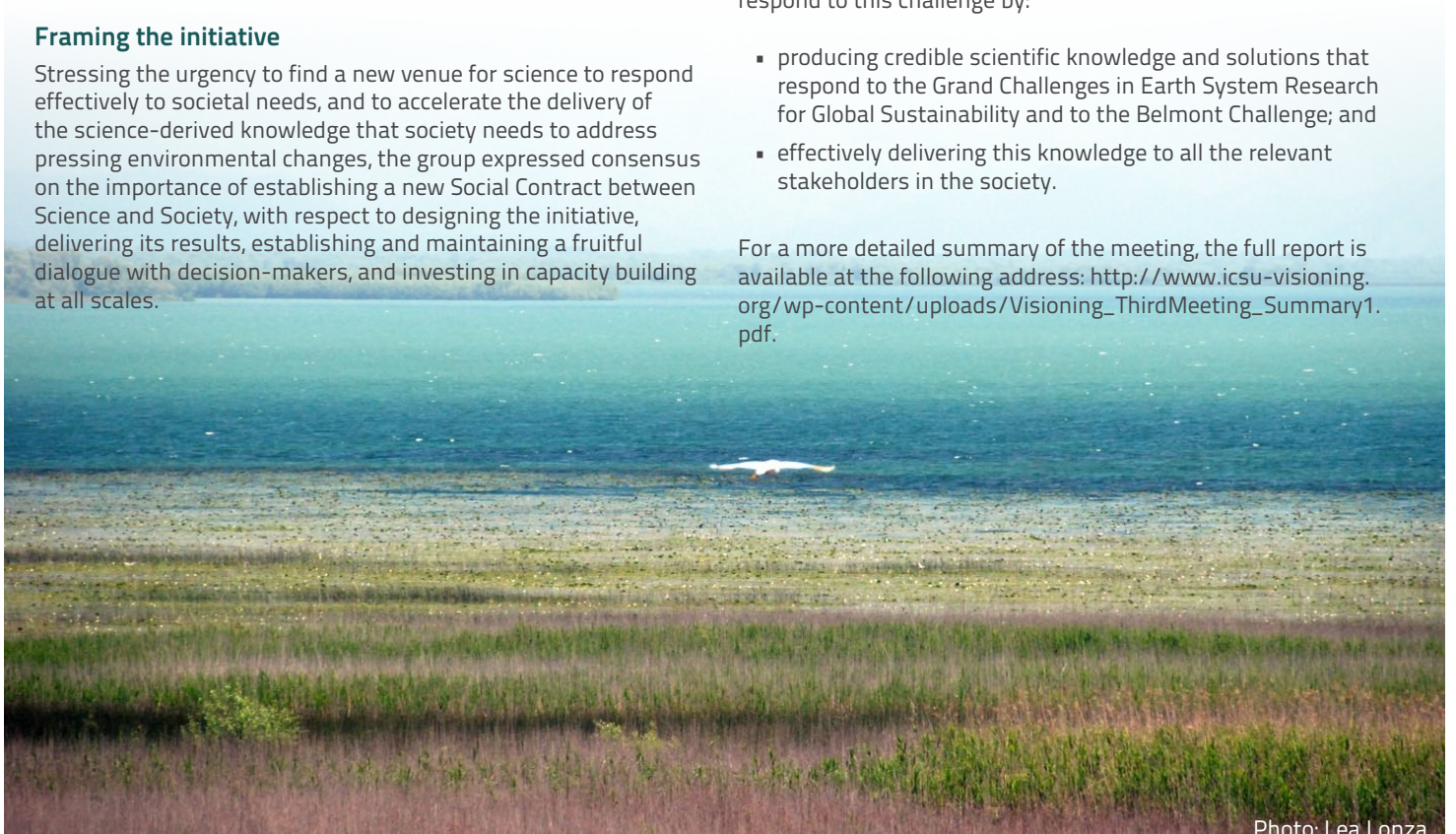


Photo: Lea Lonza

Research Partnership for the Application of Low-carbon Technology for Sustainable Development

IGES KRC Presents Joint Japan-India Project at International Symposium

The Hyogo Prefectural Government of Japan and the Kansai Research Centre of the Institute for Global Environmental Strategies (IGES KRC) organized an international symposium, "Research Partnership for the Application of Low-carbon Technology for Sustainable Development" on 7 March, 2011 in Kobe, Japan. The Symposium provided background information about an international joint research project launched in 2010 to promote the application of Japanese low-carbon technologies in India. At the Symposium, research experts and government officials also discussed the overarching concepts of this project.

Under the comprehensive goal of stabilizing atmospheric greenhouse gas (GHG) concentrations, countries have been exploring different ways to reduce human-induced GHG emissions. Among them, technology transfer is one of the globally recognized mitigation mechanisms for reducing GHG concentrations. In his presentation, Dr. Choudhury Rudra Charan Mohanty, Environment Programme Coordinator of the United Nations Centre for Regional Development (UNCRD), explained that the concept of technology transfer was developed during the initial discussion on environmentally-sound technology transfer between developed and developing countries, which took root at the UN Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992, and has been progressing through mechanisms under the UN Framework Convention on Climate Change (UNFCCC). The main idea is to apply developed countries' advance technology—which relies on lower carbon utilization—in the development phase of developing countries. Such technology exchange helps developing countries to avail of technology advances, and further pursue resource-efficiency and sustainable development.

Dr. Yutaka Suzuki, Director-General of IGES KRC, noted in his speech that the transfer of low-carbon technology enables developing countries not to repeat the conventional energy-intensive development paths but, instead, to leap-frog the conventional stage and integrate energy-efficient

technologies into their development plans. He elaborated that the importance rests upon the suitability of technology under local conditions. Dr. Prosanto Pal, Senior Fellow, Industrial Energy Efficiency Division (IEED) of the Energy and Resources Institute (TERI), gave some examples of local conditions such as technical downsides, conversion rates, electric levels, etc., and pointed out that the overall challenge is that the process of technology transfer takes longer to pay back investments up front. Bringing an important clarification to the discussion, Dr. Sawako Takeuchi, Professor at Kyoto University elucidated that the word "transfer" applied in low-carbon technology may not be appropriate, and argued that technology transfer is applicable only if local conditions are meticulously incorporated. She explained that the best technology in a country, for example in Japan, may not be directly applicable in another country, say India. Instead, Dr. Takeuchi stressed that application needs to initiate from "joint collaboration" of research projects between countries so as to identify suitability of given technology under local environmental conditions.

A real-life demonstration of the above discussion is a research project between India and Japan presented at the Symposium. At the opening talks of the Symposium, government officials



APN Secretariat's Erdenesaikhan Nyamjav asks about Panasonic's work in India



Governor of Hyogo Prefectural Government Mr. Toshizo Ido provides welcome remarks

from the two countries welcomed this partnership and expressed their positive expectations from this project. Mr. Toshizo Ido, Governor of Hyogo Prefectural Government and Mr. Vikas Swarup, Consul General of the Osaka-Kobe Consulate General of India delivered supportive opening remarks.

Mr. Girish Sethi, Director of TERI-IEED provided a fascinating presentation regarding India and its policies on climate change and energy. India is an emerging economy with unprecedented growth and is projected to grow further in the coming years. According to Mr. Sethi, this growth would translate into a five- to six-fold increase in energy demand for the next 25 years. In spite of such enormous growth, the country faces development challenges including widespread poverty, inadequate living standards and limited access to and shortages of basic electricity. Recognizing both opportunities and challenges of development, India seriously considers the unavoidable impacts of climate change. In 2008, the Government of India adopted a national strategy, the National Action Plan on Climate Change, which is based on principles of sustainable development. In the strategy, "Enhanced Energy Efficiency" is one of the eight priority missions established. This mission is oriented to take market-based approaches to unlock energy efficiency opportunities and, when implemented, aims to save annual fuel consumption by more than 23 million tonnes of oil equivalent by 2014-2015. The Indian government is keen on working with all interested parties including academia, public-private partnerships, civil society, and the private sector to promote low-carbon technologies in the country.

The main goal of the project, as Mr. Sethi went on to explain, is to promote energy efficiency and renewable energy technologies in the Small and Medium Enterprise (SME) sector in India. Currently the SME sector, one of the fastest growing segments of the Indian economy, is energy-inefficient and a significant contributor to pollution. TERI researchers have identified that the SME sector brings about a window of opportunity for technology improvement and is projected to realize high rates of energy savings if the much-needed technology is appropriately provided. However, there is currently a range of barriers to adopting energy-efficient technologies in this sector, which includes poor awareness, and lack of skilled personnel and financing. The joint research investigates other issues such as technical

methodologies, capacity building activities and policy implications for decision-makers from the government, research institutes and industrial sectors in both countries. This is supported by the Science and Technology Research Partnership for Sustainable Development (SATREPS) project as part of the Official Development Assistance (ODA) programme delivered by the Japan Science and Technology Agency (JST) and the Japan International Cooperation Agency (JICA). Launched in 2010, the project spans a four-year period and is jointly carried out by three institutions: IGES KRC, TERI and Kyoto University.

The Symposium also included an interesting talk involving the private sector. Ms. Miyai from Panasonic Corporation shared some valuable results of a market study carried out in India. The study found that household products in India tend to be highly energy intensive. As a solution, Panasonic offers tailored products that are suitable for domestic use in India, and provides them at affordable prices. During the Q&A session, Ms. Miyai observed that when promoting the Company's green innovative vision and mission, it appeared that Indian consumers practice environmentally-friendly lifestyles more widely than those in Japan.

Members of the APN Secretariat also attended. More information and presentations are available on the IGES KRC website: <http://www.iges.or.jp/en/be/activity20110307.html>

ARCP-Funded Project Outputs

Peri-urban Development and Environmental Sustainability: Examples from China and India

Reference No.: ARCP2009-05CMY-Sellers

Project Leader: Dr. Jefferey M. Sellers

Large-scale urban development will be one of the primary sources of environmental change in Asia over the next decades. More of this development will take place in India and China than in any other two countries. Understanding the dynamics and the ecological consequences of urban expansion is critical to crafting policies and institutions to manage it properly. This study carries out one of the first systematic comparative analyzes of development on the urban fringe and its environmental consequences in the two urbanizing giants of Asia. This collaborative project has brought together participants from five countries to analyze remote sensing, demographic, environmental and other data over a period of 25–30 years in 20 selected Chinese and Indian cities.

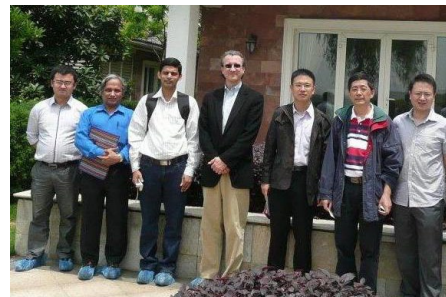
Building on the success of previous workshops held in Singapore and Bangalore, a workshop held at the School of Urban Design at China's Wuhan University from 9–11 May 2010 combined intensive data presentations and discussions among the project team with field visits to examine the process of urbanization around Wuhan and to meet with stakeholders in the city and district governments. A second, culminating workshop at the Centre for Infrastructure, Sustainable Transportation and Urban Planning (CISTUP) at the Indian Institute of Science in Bangalore, India from 4–6 December 2010 focused on finalizing the comparative data analysis and carrying out additional field visits. Participants in these workshops included Dr. Huang Jingnan (Wuhan University, China), Dr. T. V. Ramachandra (Indian Institute of Science, Bangalore), Dr. Jefferey Sellers (University of Southern California, USA), and Dr. Uttam Kumar (Indian Institute of Science, Bangalore).

Preliminary results from the project were presented at a panel organized by the research team at the first Conference of

the IHDP Project on Urbanization and Global Environmental Change (UGEC) in Tempe, Arizona, 15–17 October 2010. Final results will be presented in August 2011 in Beijing at the Eighth World Congress of the International Association for Landscape Ecology, and other venues.

The twenty-city dataset at the macro-level encompassed urban regions with populations over ten million in both countries, along with most of the next largest urban regions and a controlled selection of urban regions with populations down to one million. The analysis employed landscape metrics derived from remote sensing data (Landsat, supplemented by IRS and MODIS) for four time intervals between the late 1970s and 2008. The analysis at the micro-level has focused on neighbourhood-level dynamics of change in a stratified selection of districts on the urbanizing fringe of Bangalore and Wuhan. This analysis draws on the field research by the project team along with high-resolution satellite images.

The project has revealed striking contrasts in the transformations of urban form among Chinese and Indian urban regions. Peri-urban expansion around Chinese cities has generally proceeded at higher rates than around Indian cities. In Chinese coastal regions with strong external investment, this contrast has been especially dramatic. Indian and Chinese cities also differ in other dimensions of peri-urban expansion, such as the irregularity of urban form and the complexity of the border between built-up and non-urban land uses. Within both countries, parallel contrasts distinguish cities that have attracted concentrations of foreign investment from those that have not. The micro-analysis has linked these macro-patterns to institutional, economic and policy differences in the process of urban development.

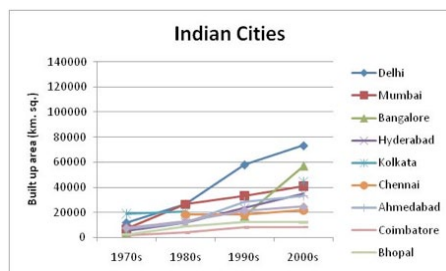
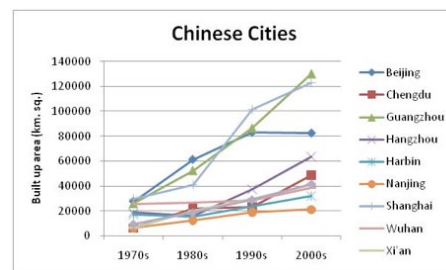


In front of a suburban villa development outside Wuhan, May 2010



Field visit to a peri-urban site outside Bangalore, December 2010

Three papers growing out of the workshops have compared the main patterns of development in Indian and Chinese urban regions and the variations within each country. Additional papers analyze the economic, social and institutional sources of the contrasting patterns of development in the two countries, the micro-dynamics of development, and the implications for stakeholders in the process of planning for future peri-urban expansion. Subsequent stages of the project will further scrutinize the environmental consequences from regional trajectories of urban development.



Role of Experiments in Sustainability Transitions in Asia

Reference No.: ARCP2009-11NSY-Roy

Project Leader: Prof. Joyashree Roy

IHDP-IT-APN International Conference on Innovation and Sustainability Transitions in Asia

University of Malaya, Kuala Lumpur, Malaysia

9–11 January 2011

Asia's transition towards more sustainable development pathways has become a fundamental challenge for the sustainability of this rapidly changing continent. Decoupling economic growth and development requires large-scale, structural change, or "system innovation," which involves the destabilization of incumbent regimes and the emergence of new regimes through novel configurations of technologies, actors, behaviours and rules.

An important new research challenge is to apply the concepts and ideas of system innovation to rapidly developing cities, regions and countries. Will niche-based innovations change development pathways by linking to and transforming emergent socio-technical regimes in key sectors? How do the niches, regimes and development pathways embedded within global knowledge, production and governance network?

To take a deeper look into these issues and innovation and sustainability transitions as a whole, the University of Malaya, Kuala Lumpur, Malaysia organized the International Conference on Innovation and Sustainability Transitions in Asia from 9–11 January 2011.

The two-day Conference was designed to develop a critical understanding of the current state of knowledge and practices on innovation and sustainability transitions, and to create a platform to facilitate interactive dialogues between different stakeholders on the themes of sustainability and innovation.

The aims of the Conference were to derive ideas regarding how people bring in changes: What is the nature of a societal transition process? What are the indirect drivers of transformation? And what are the barriers and opportunities towards sustainability transition studies? The approach to answer these questions needs to be multi-disciplinary. In the field of sustainability transition study and research, four key areas have been identified: development of better hypothesis; actor centric analysis; problem driven approach; and training towards the development of a new area of research.

The APN was represented by Dr. Subramaniam Moten, APN Scientific Planning Group (SPG) Member for Malaysia. In his opening remarks, Dr. Moten began by providing information on APN's initial contribution to the development of a research agenda of the IHDP-IT core project, through supporting the South Asia and East Asia Workshops on Research Agenda for IHDP-Industrial Transformation held in 1998. Dr. Moten added that the APN co-funded a workshop which was an initial step for setting up a broader research programme on sustainability experiments,

where policy constitutes a substantial part. Finally, he said that the APN will continue providing strong support for promoting stronger collaboration. Dr. Moten was joined by Ms. Kristine Garcia, APN Secretariat Coordinator.

As the Conference officially marked the end of the IHDP Industrial Transformation (IHDP-IT) project, there was a discussion during the introductory session on the project's achievement and its contribution towards the learning and understanding of sustainability transition over the past ten years.

The introductory session concluded with the observation that sustainability transition needs to go beyond consumption and there needs to be a complete paradigm shift in the field of sustainability transition research.

New analytical perspective

Discussions focused on transformative innovation through multilevel perspectives and socio-technical networks. It was pointed out that a synthesis is needed for innovation studies and socio-technical transition studies in order to define changes in relation to the domain of social use rather than fields of technology. It would also be important to understand the relationship between macro- and micro-level transition paths.

The approach of multiple perspective dynamics is explained by the interaction between levels and could be well-analyzed within a similar framework as evolutionary economics with an emphasis on variety and selection. Sustainable transition innovation policies need to be challenge-led and not technology-driven.

The discussion was followed by a demonstration of the issue of strategic niche management, which highlighted the importance of understanding what the conflicts between experiments and classical innovation projects are, and how protection creates both opportunities and barriers towards niche management.

The presentation and discussion then moved on to partners and pathways of sustainability experiments. The importance of ex-ante analysis, the limitations of case study analysis and the methodological challenges, the main actors in practices and the ways to compare different groups of experiments were also discussed.

The conclusion was that small structural changes, and not incremental ones, often have potential to transfer through cumulative changes over a period of time. The session put

forward a few very important questions: What are the criteria for successful experiments? Why do donor-driven projects tend to fail? How do actors build up protected spaces?

Forum on sustainable bio-fuel

As countries with high wage rates and low interest rates would tend to exploit more and more natural resources, there would be a simultaneous movement of investment from one country to the other. In that context the role of renewable energy becomes more and more important. The time is thus ideal to set the platform to understand the sustainability perspective of bio-fuel as an alternative renewable resource.

The conflict between the uses of resources for bio-fuel production and food material is one of the burning issues of the day. The sustainability of bio-fuel production thus depends on the types of raw material, the interface between bio-fuel and food production and other socio-economic and political perspectives. With respect to the production of bio-fuels, therefore, some of the cases do have high potential while the rest do not. The conflict is not only between bio-fuel and food production but questions do arise regarding the relationship between bio-fuel production and the mechanism of REDD.

However, production of bio-fuel is still on an experimental level and the scale is a limitation. The future of bio-fuel would depend on how successful experiments are up-scaled.

The forum also raised some relevant issues like the selection of raw material for bio-fuels. One suggestion was not to take a site for cultivation where its carbon stock is high in the ecosystem. The use of palm oil could also lead to enhanced biodiversity. It would be interesting to explore processes of decoupling the use of palm oil from the use of palm biomass to avoid certain conflicts.

In the context of sustainability transition, two important questions regarding the future of bio-fuel were raised: one related to its economic deployment and the other about the policies on its use.

Apart from the discussions mentioned above, a large part of the Conference was devoted to the presentation of case studies from Asia on sustainability experiments.

Conclusions

The aim of the scoping workshops were to (i) give grounds for the development of a conceptual framework for inventorizing, classifying and analyzing sustainability experiments, (ii) develop a research strategy for identifying opportunities and barriers for successful sustainability experiments, (iii) identify appropriate governance strategies to assist local level policy-makers in up-scaling experiments and increasing their impact, (iv) synthesize and reflect on current knowledge about innovation and sustainability transitions in Asia, and (v) set up a new research agenda on innovation and sustainability in Asia.

The project prepared a research programme on ways in which alternative, more sustainable development pathways can be initiated in the local contexts of Asian countries and how to empower local communities and policy-makers to design initiatives that will help achieve the goal. The knowledge

generated will directly help stakeholders in their future experiments.

The project prepared a solid ground for the transfer of existing—and the creation of new and context-specific—knowledge on the human dimensions of change in the Earth system. By considering major systems of provision (mobility, energy, water, food, housing) and alternative, more sustainable, pathways of their development, the project contributed to the core science agenda of the APN.

Furthermore, by involving local policy-makers and practitioners already at the stage of formulating interesting and relevant research questions as well as by focusing on a strategy to develop a policy tool kit, the project fully corresponds to the policy agenda of the APN.

Future directions

Although the important questions were raised in an Asian context where experiments and rapid industrial transformation started some time ago, they are also relevant for other areas, in particular several countries on the African continent. It is important not only from the perspective of Asian transitions towards sustainability, but also from a general (theoretical) “systems innovation” perspective. System innovations can only come about through interactions between processes at different levels. The nature and timing of linking and coordination processes can result in different transition pathways. The failure of the experiments in the Asian context can be understood as a lack of creating linkages or a lack of coordination between processes on these different levels. Understanding these processes also offers insight in terms of options to guide sustainability transitions.

The workshops opened the possibility of developing a proposal for conducting a small follow-up meeting to develop a research proposal for APN’s next round of proposal submission.



Biochar for Carbon Reduction, Sustainable Agriculture and Soil Management

Reference No.: ARCP2009-12NSY-Karve

Project Leader: Dr. Priyadarshini Anand Karve

Biochar, Carbon Reduction and Sustainable Soils—What Role in Asia-Pacific?

Biochar is the solid remains of biomass heated in an oxygen-depleted environment. Unlike the carbon found in most organic matter, biochar carbon is chemically altered in the heating process, during which aromatic carbon ring structures, which are highly resistant to micro-organism attacks, are formed. As a consequence, biochar carbon can remain in the soil for long periods of time—hundreds to thousands of years—and could be an important way of storing carbon that has been scavenged from the atmosphere through photosynthesis. What is more, biochar can enhance soil health and has been demonstrated to promote plant growth in some situations. Biochar can be produced from modern technological processes used for generating fuels and/or electricity from biomass, such as gasification and pyrolysis, and energy generation is likely to be the main driver for biochar production in the near future.

The project

The objectives of the APN-supported Biochar for Carbon Reduction, Sustainable Agriculture and Soil Management (BIOCHARM) Project were to assess the opportunities for biomass-bioenergy-biochar systems in India, Cambodia and the Philippines. The project evaluated two types of biochar with respect to their impact on net carbon equivalent abatement; their physio-chemical and structural properties and the stability of the char carbon; their environmental, health and safety impacts; and their impacts on the crop yield of soil-in-pot and field trials, both replicated and non-replicated, with a range of crop types and other soil amendments.

The two types of biochar used in the project were:

- carbonized rice husks (CRHs), the by-product from small- to medium-sized (150–300 kW capacity) gasifiers located in rice mills utilizing rice husks as the fuel; and
- biochar produced from agricultural waste such as sugarcane leaf litter and maize cobs using updraft gasifier kilns.

CRHs do not have a clear use at present and there is already a surplus of rice husk ash relative to demand. Hundreds of kilogrammes of CRHs are produced daily from the gasifiers and very large piles build up. Such piles are largely inert, but could generate a pollution risk through leaching, wind or water erosion, or ingestion by animals, among others. The agricultural waste feedstock is plentifully available and currently not being used for any specific purpose.

Biochar: carbon abatement in a wiser way

The study calculated the carbon and energy balance of the rice husk gasifiers and examined the physio-chemical properties of the two biochar samples. The unstable carbon—expected to be lost through decomposition in a time-scale of hours to decades—has been estimated using laboratory techniques, thus permitting an estimate of the carbon which would be stored in the long term. Simplified life cycle assessment methods were used to measure how much carbon dioxide and other greenhouse gases are reduced and removed from the atmosphere across the biomass life-cycle

(i.e. from growth to soil incorporation). The study found that between 0.9 to 1 tonne of CO₂ is removed from (or avoided from entering) the atmosphere per tonne of rice husk gasified.

India is the world's second largest rice producer at 132 million tonnes (Mt) paddy rice in 2009–2010; the Philippines produced 14 Mt and Cambodia 7 Mt over the same period. Assuming that 22% of this paddy rice production is rice husk, and that an arbitrary one third of the rice husks could be made available, the potential carbon abatement from the use of CRHs will be approximately 9 Mt CO₂ (India), 1 Mt CO₂ (the Philippines) and 0.5 Mt CO₂ (Cambodia).

If we compare CRHs to some other existing uses of rice husks, such as incorporation into irrigated rice fields, then the greenhouse gas benefit of converting to biochar becomes more significant. This is because, in anaerobic conditions, some of the carbon in rice husks added to soil converts to methane, a potent greenhouse gas. Including such an evaluation of alternatives would therefore increase the greenhouse savings by two or more times per tonne of husks. On an area basis, the conversion to CRHs may reduce greenhouse gas emissions by up to five times compared with adding husks to irrigated fields.

Agronomic value: a mixed-picture

The agronomic results provide a mixed-picture of the effectiveness of biochar in existing agricultural contexts. Trials growing plants in pots in Cambodia demonstrate that biochar can have a strongly positive effect upon yields.

There was a statistically significant (95% confidence level) response to increasing biochar additions for lettuce (harvestable mass, root mass, number of leaves and stem length) and cabbage (harvest and stem length).

The irrigated rice field trials showed a statistically significant increase in paddy yield with a 41 t ha⁻¹ addition of CRHs in the case of one farm, but not in another farm which is 100 meters away and used the same variety. The team is yet to account for the difference in response.

A variety of non-replicated exploratory trials with vegetables and irrigated rice also gave positive results with respect to yield. The Indian pot trials did not show such a clear result as those in Cambodia. Three applications stand out as increasing fresh biomass relative to the untreated control: biochar at 20 t ha⁻¹, biochar at 20 t ha⁻¹ with chemical fertilizer and chemical fertilizer only. Higher biochar applications (40, 60 and 80 t ha⁻¹) appear to reduce overall fresh biomass weight compared to the 20 t ha⁻¹ level and/or synthetic fertilizer applications.

The Indian maize field trials using biochar from sugarcane trash and corn cobs did not show any statistically significant yield response. However, there was some evidence, though statistically insignificant,

of a declining yield with biochar additions beyond 20 t ha⁻¹. The increase in maize yield for the 20 t ha⁻¹ biochar application was significant at the 92% confidence level compared to the control.

The value of the stored carbon in the CRHs is about 12 US Dollars per tonne assuming a carbon price of \$10 t CO₂⁻¹. If the value of the avoided carbon emissions from the production of bio-energy is included, the carbon value per tonne of CRHs increases to about \$26. If the alternative use of rice husks is aerobic or anaerobic decomposition, the carbon abatement value per tonne of CRHs can range from \$37–69. The agronomic value is currently highly uncertain, but our trials suggest it is in the order of \$3–13 t⁻¹.

For more information about this project, please download the final report, Biochar for Carbon Reduction, Sustainable Agriculture and Soil Management (BIOCHARM), at the following address: <http://www.apn-gcr.org/newAPN/activities/ARCP/2009/ARCP2009-12NSY-Kerve/ARCP2009-12NSY-Karve.pdf>

Research Team: Dr. Priyadarshini Karve, Dr. Simon Shackley, Sarah Carter, Mr. R. Prabhune, Dr. Stephan Haefele, John Field and Paul Tanger

Organizations: Appropriate Rural



Technology Institute (ARTI), Pune, India; UK Biochar Research Centre (UKBRC), University of Edinburgh, International Rice Research Institute (IRRI), the Philippines; SME Cambodia; Colorado State University, CO., USA.

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Announcement

APN 2011 Annual Calls for Proposals Officially Open for Submissions

The APN is inviting proposals under two separate programmes, the Annual Regional Call for Research Proposals (ARCP) Programme and the Scientific Capacity Building/Enhancement for Sustainable Development in Developing Countries (CAPaBLE) Programme, for funding from April 2012, and is able to provide a limited amount of financial support for research and capacity development activities that fall within its areas of interest.

For more information please visit APN's webiste:

<http://www.apn-gcr.org/newAPN/opportunities/callsForProposals/2011/annualCall/annualCall.htm>

Deadlines:

1. For advisory service (voluntary) - submission of letter of intent:
Friday, 24th June 2011, midnight (24:00) – Japanese Standard Time
2. For submission of summary proposal (compulsory):
Friday, 29th July 2011, midnight (24:00) – Japanese Standard Time

For queries please contact:

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Photo: Marshall Astor

Scientific Capacity Development of Trainers and Policy-Makers for Climate Change Adaptation Planning in Asia and the Pacific

Reference No.: CBA2010-09NSY-Okayama
Project Leader: Dr. Toshinao Okayama

Climate change has been projected to have critical implications on socio-economic development and poverty reduction both globally and in the Asia-Pacific region. Since 2008, the United Nations Environment Programme (UNEP) has been facilitating the development of a Global Adaptation Network (GAN) in partnership with key UN agencies and international organizations. GAN comprises four Regional Networks in developing regions: Africa, Asia-Pacific, West Asia, and Latin America and the Caribbean.

Assessing and bridging gaps

The Asia-Pacific Adaptation Network (APAN) was launched in October 2009 and aims to help countries in the region to build climate resilience in vulnerable human systems, ecosystems and economies through the mobilization and sharing of knowledge and technology to support adaptation capacity building, policy setting, planning and practices. One of its objectives is to build the capacity of key stakeholders such as trainers, policy-makers and development practitioners in the Asia-Pacific region in order to mainstream climate change adaptation principles and practices into development planning.

To this end, the project entitled "Scientific Capacity Development of Trainers and Policy-Makers for Climate Change Adaptation Planning in the Asia and the Pacific" was approved by the APN in April 2010. The main objectives of this project are to:

1. Undertake training needs assessment (TNA) in terms of knowledge and skill areas for effective adaptation to climate change; and
2. Design training modules for imparting knowledge and skills for effective adaptation.

As a pilot initiative, this APN project focuses on the agriculture sector, the most vulnerable sector to climate change, in the five targeted countries including Bangladesh, Cambodia, Lao DPR, Mongolia and Nepal.



Keeping in mind that TNA is the first step towards the design and development of capacity building programmes, this APN project organized the first TNA Meeting on 31 January 2011 at the Asian Institute of Technology (AIT) in Thailand to:

1. Introduce partners to APAN and its capacity building agenda,
2. Reach consensus on modalities for implementing APN projects,
3. Obtain preliminary information and facilitate discussions on national systems for capacity building, and
4. Agree on cooperation in developing national strategies for capacity building in the long term.

Participants included trainers from national training institutions, lecturers from universities and ministerial staff working in agriculture sectors of the five targeted countries. The meeting was also attended by colleagues from the Institute for Global Environmental Strategies (IGES), AIT, UNEP Regional Office for Asia and the Pacific (ROAP), AIT-UNEP Regional Resource Centre



for Asia and the Pacific (RRC.AP), and the United States Agency for International Development (USAID).

Key messages unveiled

Some key messages emerged out of the presentations and discussions during the meeting.

First, climate change adaptation itself is an issue of capacity building, and capacity building for key stakeholders is of paramount importance for promoting climate change adaptation in some vulnerable sectors and countries in the Asia-Pacific region. Awareness generation and capacity building of policy-makers are crucial to bringing change in various government-related processes and society at large.

Second, there have already been several initiatives by various international and national agencies for training and capacity building for key stakeholders. Training and capacity building for various government staff and trainers have been facilitated by both formalized systems consisting of induction and on-the-job training programmes and ad-hoc training programmes that are conducted from time to time when resources are available. However, these initiatives are still inadequate in terms of design and implementation.

Third, discussions revealed the presence of training and capacity needs assessment for adaptation for priority sectors in some of the project countries. However, the nature and detail of these training and capacity needs are not yet clear and have to be taken into consideration before making any further interventions.

Fourth, the formulation of training modules and pilot programmes should not be seen as an end but as a beginning for creating an enabling environment for engaging different stakeholders. Active and coordinated engagement of national and

local governments and other stakeholders is crucial to regularize training and capacity building programmes in the region.

Fifth, APAN is well-placed to play an important role as a facilitator to bring various stakeholders together, to initiate training needs assessment, and to formulate training modules and pilot training programmes. However, piloting and scaling-up of these initiatives require the proactive participation of various stakeholders including support from governments, NGOs, national and local institutions and donor agencies.

Since the first TNA Meeting had already come up with certain agreements on the modalities for conducting TNA in targeted countries, the second TNA meeting was organized on 11 March 2011 in Bangkok to (i) review the process of conducting TNA for the agriculture sector in the five countries by national partners, (ii) discuss on the advantages, constraints, challenges and other issues practically faced by national partners in conducting TNA, and (iii) identify solutions and ways towards more detailed TNA.

Through this meeting, the APN project expects to get a preliminary report on TNA from the five targeted countries in order to move towards more detailed TNA and the design of training modules at the conclusion of the project. Piloting and evaluation of training modules are planned to be carried out in the next phases of the project in the following years.

Capacity Building for Mainstreaming Climate Change Issues into Socio-Economic Development Planning in Viet Nam

Reference No.: CBA2010-06NSY-Brunner

Project Leader: Mr. Jake Brunner

This project originally intended to focus on national level decision-makers and national level climate change impacts in Viet Nam. But given the projected severity of sea level rise in the Mekong Delta, the project was redesigned to address climate change issues in the delta. The project was delivered in two components: a high-resolution Geographic Information System (GIS) database of land cover in the southern part of the delta using SPOT images acquired in 2009 and 2010; and two workshops on environmental change and emerging climate change impacts in the Mekong Delta.

Most mangrove loss in types B and C is from clearing for shrimp ponds. Such large-scale clearing has serious consequences, since mangroves protect against tidal waves and storm surges; they are vital fish nursery grounds, provide timber, honey, and other products; and, under the right conditions they raise the land level by trapping sediment. Mangroves also sequester carbon faster than any other forest type. Although the daily uptake is not exceptional, they can absorb carbon dioxide virtually all year round. At the same time, little carbon is removed from the mangrove ecosystem

of dykes has also limited the extent and duration of the annual flood, resulting in sedimentation of the canals, which requires extensive dredging, and reduced natural fertilization of the rice fields, which requires heavy use of chemicals.

The second workshop revealed the strong tendency to prioritize investments in infrastructure. But as the group discussion continued there was a move to balance investment in hard infrastructure with increased investment in farmer training, improved agricultural extension, crop diversification and other "softer" interventions. This reaction may reflect the growing realization, at least within academia and NGO communities, that continued investment in roads, canals, and dykes is causing major environmental problems.

There is also an ingrained fear of floods among some participants. A participant from the Mekong Delta observed that the Vietnamese word for flood (lu) was not used in the delta in the past, reflecting the fact that farmers there see floods as normal and beneficial, whereas in the north they are seen as destructive. Fear of flooding has dominated government planning in the delta. Indeed, drought is in some respects good news for government officials because there is less damage to roads and other infrastructure. There are, therefore, major divides in understanding and approach between the north and south, between farmers and decision-makers, and between ministries.

“ “ The most striking finding from the land cover database was the extent to which the mangroves in the delta have been degraded

The most striking finding from the land cover database was the extent to which the mangroves in the delta have been degraded. Broadly speaking, three types remain: a thin veneer of mangroves along the east coast (A), a large but highly fragmented area of mangroves to the south (B), and a relatively intact block of mangroves covering the Mui Ca Mau National Park (C).

Type A has been fragmented by local cutting for timber and fuelwood and efforts to replant mangroves have been largely unsuccessful because the heavy sediment flow from the Mekong River and powerful along-shore currents result in distinct patterns of erosion and sedimentation that set absolute limits on where replanted mangroves will survive.

through decay. Healthy mangroves thus make important contributions to both climate change adaptation and mitigation and form the basis of coastal ecosystem-based adaptation, an approach that complements hard infrastructure that governments around the world tend to favour.

The first workshop found that state-led efforts to "re-plump" the Mekong Delta have had significant unexpected outcomes. Indeed, it can be considered a case study in the law of unintended consequences associated with large-scale infrastructure development. Dykes have been strengthened and new ones built but this is expensive and often unsuccessful because the dykes are now exposed to the full force of the waves, resulting in scouring and collapse. The construction

ARCP 2011/12 Projects

ARCP2011-01CMY-Wang

Project Title: Building Asian Climate Change Scenarios by Multi-Regional Climate Models Ensemble

Project Leader: Dr. Shuyu Wang, Institute of Atmospheric Physics, Chinese Academy of Sciences, CHINA

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ARCP2011-02CMY-Koike

Project Title: River Management System Development in Asia Based on Data Integration and Analysis System (DIAS) under GEOSS

Project Leader: Dr. Prof. Toshio Koike, The University of Tokyo, JAPAN

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ARCP2011-03CMY-Asanuma

Project Title: Intercomparison of Landsurface Process Modeling in Asian Drylands

Project Leader: Dr. Jun Asanuma, Terrestrial Environment Research Centre, University of Tsukuba, JAPAN

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ARCP2011-04CMY-Uprety

Project Title: Community-based Forestry and Livelihoods in the Context of Climate Change Adaptation

Project Leader: Dr. Dharam Raj Uprety, International Forestry Resources and Institutions (IFRI) and ForestAction, NEPAL

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ARCP2011-05CMY-Bae

Project Title: Climate Change Impact Assessment on Asia-Pacific Water Resources under AWCI/GEOSS

Project Leader: Prof. Deg-Hyo Bae, Sejong University, REPUBLIC OF KOREA

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ARCP2011-06CMY-Li

Project Title: Analysis on Urban Land-use Changes and its Impacts on Food Security in Different Asian Cities of Four Developing Countries using Modified CA Model

Project Leader: Prof. Jianlong Li, The Global Change Research Institute, College of Life Science, Nanjing University, CHINA

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ARCP2011-07CMY-Han

Project Title: The Impact of Spatial Parameters on GHG Emission: A Comparative Study between Cities in China and India

Project Leader: Dr. Sun Sheng Han, The University of Melbourne, AUSTRALIA

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ARCP2011-08CMY-Huda

Project Title: Food Security and Climate Change in the Asia-Pacific Region: Evaluating Mismatch between Crop Development and Water Availability

Project Leader: Prof. Samsul Huda, University of Western Sydney, AUSTRALIA

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ARCP2011-09CMY-Towprayoon

Project Title: Strategic Rice Cultivation for Sustainable Low Carbon Society Development in Southeast Asia

Project Leader: Assoc. Prof. Dr. Sirintornthep Towprayoon, King Mongkut's University of Technology, THAILAND

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ARCP2011-10CMY-Lutaenko

Project Title: Coastal Marine Biodiversity of Viet Nam: Regional and Local Challenges and Coastal Zone Management for Sustainable Development

Project Leader: Dr. Konstantin Lutaenko, Institute of Marine Biology, RUSSIAN FEDERATION

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ARCP2011-11NMY-Patra/Canadell

Project Title: Greenhouse Gas Budgets of South and Southeast Asia

Project Leaders: Dr. Prabir K. Patra and Dr. Josep Canadell, Research Institute for Global Change (JAMSTEC), Global Carbon Project (GCP), JAPAN/AUSTRALIA

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ARCP2011-12NMY-Fortes

Project Title: Seagrass-Mangrove Ecosystems: Bioshields Against Biodiversity Loss and Impacts of Local and Global Change along Indo-Pacific Coasts" (The Seagrass-Mangrove Bioshield Project, SMBP)

Project Leader: Prof. Miguel Fortes, Marine Science Institute, University of the Philippines, PHILIPPINES

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

ARCP2011-13NMY-Herath

Project Title: Developing Ecosystem-based Adaptation Strategies for Enhancing Resilience of Rice Terrace Farming Systems against Climate Change

Project Leader: Prof. Anura Srikantha Herath, Institute for Sustainability and Peace, United Nation University (UNU), JAPAN

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ARCP2011-14NMY-Salik

Project Title: Impact of Climate Change on Mangrove Ecosystems in South Asia

Project Leader: Mr. Kashif Majeed Salik, Global Change Impact Studies Centre (GCISC), PAKISTAN

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ARCP2011-15NMY-Zhen

Project Title: Holistic Assessment of Land-use Change and Impacts on Ecosystem Services of Wetlands

Project Leader: Dr. Lin Zhen, Institute of Geographic Sciences and Natural Resources Research (IGSNRR), Chinese Academy of Sciences, CHINA

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ARCP2011-16NMY-IGBP

Project Title: An International Geosphere-Biosphere Programme Synthesis Theme on: Global Environment Change and Sustainable Development—Needs of Least Developed Countries

Project Leader: Prof. João M. F. de Morais, International Geosphere-Biosphere Programme (IGBP)

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ARCP2011-17NMY-Mathukumalli

Project Title: Tracing Nitrogen and Carbon Biogeochemical Processes in the Inter-tidal Mangrove Ecosystem (Sundarban) of India and Bangladesh: Implications of Global Environmental Change

Project Leader: Dr. Bala Krishna Prasad Mathukumalli, Earth System Science Interdisciplinary Centre, University of Maryland, UNITED STATES OF AMERICA

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ARCP2011-18NMY-Jung

Project Title: Impacts of Global Warming on Coastal and Marine Ecosystems in the Northwest Pacific

Project Leader: Dr. Sukgeun Jung, National Fisheries Research and Development Institute, REPUBLIC OF KOREA

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ARCP2011-19NSY-Koottatep

Project Title: Affordable Sanitation as an Adaptive Strategy to Emerging Waterborne Diseases due to Climate Change

Project Leader: Dr. Thammarat Koottatep, Asian Institute of Technology (AIT), THAILAND

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ARCP2011-20NSY-McEvoy

Project Title: Assessment of Climate Change Risks and Adaptation Options for Secondary Cities in Southwest Bangladesh and Central Viet Nam

Project Leader: Dr. Darryn Mcevoy, Global Cities Research Institute, Royal Melbourne Institute of Technology University, AUSTRALIA

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ARCP2011-21NSY-Manurung

Project Title: Reconstruction of Sea-level Change in Southeast Asia (RESELECASEA) Waters Using Combined Coastal Sea Level Data and Satellite Altimetry Data

Project Leader: Dr. Parluhutan Manurung, National Coordinating for Survey and Mapping Agency (BAKOSURTANAL), INDONESIA

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ARCP2011-22NSG-Liu

Project Title: The Impact of Global Warming on Ocean-Atmosphere Feedback Strength at Tropical Indian Ocean (Proposal Development)

Project Leader: Dr. Lin Liu, First Institute of Oceanography, State Oceanic Administration, CHINA

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CAPaBLE 2011/12 Projects

CBA2011-01CMY-Kawai

Project Title: Capacity Building of Biodiversity Research in the Coastal Zones of the Asia-Pacific Region: Phycology Taxonomy Analysis Training using Genetic Marker

Project Leader: Prof. Hiroshi Kawai, EMECS Secretariat & Kobe University Research Centre for Inland Seas, JAPAN

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CBA2011-02CMY-Kaihotsu

Project Title: Drought Monitoring System Development by Integrating In-situ Data, Satellite Data and Numerical Model Output

Project Leader: Prof. Ichirow Kaihotsu, Hiroshima University, JAPAN

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CBA2011-03NSY-WCRP

Project Title: WCRP Open Science Conference: Climate Research in Service to Society

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CBA2011-04NSY-IHDP

Project Title: IHDP Training Workshops on Asian Development Pathways in the Context of Transitions Towards a "Green Economy"

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CBA2011-05NSY-Schang

Project Title: National Dialogues on Adapting Biodiversity Management to Climate Change

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CBA2011-06NSY-LOICZ

Project Title: Young LOICZ Forum 2011: Capacity Building in the Asia-Pacific Region

Project Leader: Dr. Cheng Tang, Yantai Institute of Coastal Zone Research (YIC), Chinese Academy of Sciences, CHINA

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CBA2011-07NMY-Abawi

Project Title: Building Scientific Capacity in Seasonal Climate Forecasting (SCF) for Improved Risk Management Decisions in a Changing Climate

Project Leader: Prof. Yahya Aabawi, National Climate Centre, Bureau of Meteorology, AUSTRALIA

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CBA2011-08NSY-Baker

Project Title: Towards Engagement in the United Nations Regular Process for Global Assessment of the Marine Environment: Strengthening Capacity of Developing Countries in the Seas of East Asia

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CBA2011-09NSY-Aligaen

Project Title: Climate Change Integrated Education Model: Building Adaptive Capacity for the Next Generation (Malaysia, Indonesia, Thailand, Philippines and Lao PDR)

Project Leader: Mr. Julito C. Aligaen, Southeast Asian Ministers of Education Organization Regional Education Centre for Science and Math (SEAMEO RECSAM), MALAYSIA

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CBA2011-10NSY-Ngari

Project Title: International Workshop on Climate and Oceanic Fisheries

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CBA2011-11NSY-Tienhaara

Project Title: Climate Change Governance in the Asia-Pacific Region: Agency, Accountability and Adaptativeness

Project Leader: Dr. Kyla Tienhaara, Regulatory Institutions Network, College of Asia & the Pacific, Australian National University, AUSTRALIA

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CBA2011-12NMY-Hasson

Project Title: Capacity Building in Advanced Remote Sensing (RS) & Geographic Information System (GIS) Techniques for Studying Snow and Ice Dynamics in Hindu Kush-Karakoram-Himalaya (HKH) Region

Project Leader: Mr. Shabeh Ui Hasson, Global Change Impact Studies Centre, PAKISTAN

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The Scientific Capacity Building/Enhancement for Sustainable Development in Developing Countries (CAPaBLE) programme, which was launched in April 2003, is an initiative to realize parts 107 to 114 of the Johannesburg Plan of Implementation (JPOI) for the World Summit on Sustainable Development (WSSD) and is registered as a WSSD Type II Partnership Initiative. Of particular relevance is Part 111 of JPOI:

"Establish regular channels between policy-makers and the scientific community for requesting and receiving science and technology advice for the implementation of Agenda 21, and create and strengthen networks for science and education for sustainable development, at all levels, with the aim of sharing experiences and best practices, and building scientific capacities, particularly in developing countries".

The CAPaBLE programme is enhancing scientific capacity in developing countries to improve decision-making relating to issues that are directly linked to their sustainable development. This effort is being achieved through a two-track process of capacity enhancement for experienced leading scientists and capacity development for early-career scientists under the APN Annual Call for Proposals.

CBA2011-13NSY-Tolentino

Project Title: Institutionalizing Agroforestry as a Climate Change Adaptation Strategy through Local Capacity and Policy Development in Southeast Asia

Project Leader: Dr. Lutgarda Tolentino, Philippine Agroforestry Education and Research Network, PHILIPPINES

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CBA2011-14NSY-Ng

Project Title: Water Safety from Source to Tap – Strategies and Implementations

Project Leader: Assoc. Prof. How Yong Ng, Centre for Water Research, Division of Environmental Science and Engineering, National University of Singapore, SINGAPORE

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CBA2011-15NSY-Wagan

Project Title: Capability Enhancement of the Local Experts from State Universities and Colleges in Assessing Climate Change Vulnerability and Adaptive Capacity of Crop-based Farming Systems in Various Agroecological Settings

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CBA2011-16NSY-Li

Project Title: Demonstration Study on Advancing Global Change Research Approaches Based on Inter-Agency Collaboration and Data Infrastructure of GENESI and GeoBrain

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CBA2011-17NSG-Devy

Project Title: Building Partnerships for Developing a South Asian Canopy Science Research Program

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CBA2011-18NSY-Peñalba

Project Title: Awareness Raising and Capacity Building on Alternative Water Management for Communal Irrigator's Association in the Philippines

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CRP2011-01CMY-Pereira

Project Title: Strengthening Capacity for Policy Research on Mainstreaming Adaptation to Climate Change in Agriculture and Water Sectors

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2. **Sri Lanka:** Dr. R.H.S. SAMARATUNGA
3. **Cambodia:** Mr. Sundara SEM

Ex-officio (SPG Co-Chairs)

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2. **Nepal:** Dr. Madan Lall SHRESTHA

Co-opted members

1. Mr. Louis BROWN (Invited Expert)
2. Prof. Roland FUCHS (Invited Expert)
3. Dr. W. Andrew MATTHEWS (Invited Expert)
4. Mr. Yutaka MATSUZAWA (Donor Member)
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Calendar of Global Change Events

2011

JUNE

- a** 14–18 June
22nd Pacific Science Congress, Kuala Lumpur, Malaysia. Please visit: <http://22ndpsc.net/>

JULY

- b** 19–23 July
6th World Environmental Education Congress, Brisbane, Queensland, Australia. Please visit: <http://www.weec2011.org/>
- c** 20–27 July
XVIII INQUA–Congress, Bern, Switzerland. Contact Prof. Christian Schlüchter: christian.schluechter@geo.unibe.ch or visit: <http://www.inqua2011.ch/>

AUGUST

- d** 8–12 August
Youth Forum on Climate Actions and Mountain Issues. For more details, please access <http://www.icimod.org/?q=3279>
- e** 28–31 August
EMECs 9, Managing for Results in our Coastal Seas – Global Summit on Coastal Seas, Baltimore, Maryland, U.S.A. Please visit: <http://www.conference.ifas.ufl.edu/emecs9/>

SEPTEMBER

- f** 8–15 September
LOICZ 2011 Open Science Conference, Yantai, China. Please visit: <http://www.loicz-osc2011.org/>

- g** 16–17 September
iLEAPS Early Career Scientist Workshop (ECSW)—“Challenges and Chances of Interdisciplinary Collaboration in Land Ecosystem-Atmospheric Processes (LEAP) Science”, Garmisch-Partenkirchen, Germany

- h** 18–23 September
3rd iLEAPS International Science Conference, Partenkirchen, Germany. Please visit http://www.ileaps.org/multisites/Science_Conference_2011/

OCTOBER

- i** 24–28 October
WCRP Open Science Conference, Denver, Colorado, USA. Please visit: <http://www.wcrp-climate.org/conference2011/>

NOVEMBER

- j** 7–11 November
Second Asia-Pacific Forestry Week: New Challenges—New Opportunities, Beijing, China. Website: <http://www.fao.org/forestry/44155/en/> Contact: ap-forestry-week@fao.org

2012

- k** 26–29 March
Planet Under Pressure: New knowledge, New Solutions, London, UK. Please visit: <http://www.igbp.net/page.php?pid=531>

- l** 4–6 June
EARTH SUMMIT 2012 Sustainable Development—The Peace of the Future, Brazil. Please visit: <http://www.earthsummit2012.org/>



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