

CBA2013-04NSY-WCRP, CBA2013-12NSY-MAIRS, CBA2012-18NSY-PAGES

# Youth Engagement on Global Change: Cultivating the Next Generation of Sustainability Leaders

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**SUMMARY:** Over the last 20 years, the Asia-Pacific Network for Global Change Research (APN) has been instrumental in shaping climate research, capacity building, networking and training activities in the Asia-Pacific region. Since the late 1990's, APN has been a consistent supporter of relevant global environmental change initiatives such as the Regional Modelling Inter-comparison Project (RMIP) Asia, Monsoon Asia Integrated Regional Study (MAIRS), Coordinated Regional Climate Downscaling Experiment (CORDEX) and Past Global Changes (PAGES). By engaging young scientists and encouraging regional global change research, APN contributes to the success of various Global Environmental Change (GEC) programmes and is helping cultivate the next generation of sustainability leaders in the fields of paleo-monsoon climate, regional modelling, impact assessments and transdisciplinary studies.

**KEYWORDS:** regional climate modelling, impact assessment, transdisciplinary study, capacity building, young scientists

## Introduction

The Asia-Pacific region is a hotspot for climate change and sustainability research because of its significant regional monsoon climate, interaction with the global climate system and greater economic activity in recent decades. The conflict between economic development and environmental degradation needs tremendous scientific support to regional sustainable development. To improve the research capacity of the regional scientific community, APN has been supporting cultivating regional young scholars by collaborating with regional and global environmental change research programmes, such as MAIRS, CORDEX and PAGES, in broader fields of paleo-monsoon climate change, regional climate modelling, impact assessments and cross-cutting studies.

The Monsoon Asia Integrated Regional Study (MAIRS) is a regional research programme focused on integrated studies across the monsoon Asian region. MAIRS was established in 2006 and is a core project under Future Earth. Its Regional Modelling Inter-comparison Project (RMIP) started in the late 1990s, led by a group of senior scientists from China, Republic of Korea, Japan, Australia and USA. RMIP was recognised as one of the modelling inter-comparison studies by the World Climate Research Programme (WCRP) and International Geosphere-Biosphere Programme (IGBP). In 2012, RMIP was merged with WCRP's Coordinated Regional Climate Downscaling Experiment (CORDEX) Asia through joint coordination of MAIRS and WCRP.

CORDEX aims to provide regional climate change projections to support impact and adaptation studies (<http://wcrp-cordex.ipsl.jussieu.fr>). For Asia, there are three CORDEX domains planned and designed covering South Asia, South East Asia and East Asia. Additionally, there is another domain that is focused in the southern hemisphere, specifically the Australasia region.

Meanwhile, IGBP has focused its work on the interactions between biological, chemical and human systems and is responsible for a number of major international projects and joint initiatives. Past Global Changes (PAGES), one of the core projects of IGBP, is

an international effort to coordinate and promote past global change research. The project's primary objective is to enhance the understanding of past changes in the Earth system in order to improve projections of future climate and environment, and inform strategies for sustainability.

## Building up Regional Modelling Networks in Asia-Pacific by Engaging Young Scientists

From 1999–2002, RMIP Asia activities aimed to encourage local scientists to lead the activity on regional climate modelling. With support from APN, RMIP leaders built up RCM networks, and designed and implemented climate modelling inter-comparison experiments in Asia. A WCRP regional-scale climate modelling workshop in Baltimore, USA, in collaboration with Climate and Ocean: Variability, Predictability and Change (CLIVAR) and WCRP groups was held in June 2004. In 2010, multi-model ensemble future scenarios from RMIP products were developed, while in 2012, a project aimed at supporting urban planning in Southeast Asia using RMIP products was piloted. In more than one decade, under APN's continuous support not only to senior researchers, but also to juniors, CORDEX Asia has built up interactive and stable networks by involving institutions, stakeholders and end-users on climate modelling, data sharing and capacity building.

## Cultivating Leaders from the Young Generation

With support from APN, RMIP Asia promotes young scientists' engagement and capacity building. After a decade, junior scientists involved in RMIP activities are now becoming leaders of regional modelling research in Asia. These include Dr. Shuyu Wang (Nanjing University) who has led RMIP phase III experiments since 2010, Dr. Hyun-Suk Kang (NIMR-KMA), Prof. Xuejie Gao (CAS/China), Dr. Koji Dairaku (NIED/Japan), and Dr. Myoung-Seok Suh (Kongju National University)—all of whom are key scientists in the CORDEX Asia group.

## Young Scientists Involvement in CORDEX Initiatives

In 2013, a project led by Prof. M. Manton (ARCP2013-15NMY-Manton) was implemented to promote cooperation between the climate downscaling communities and the vulnerability, impact and adaptation communities across the region, by way of collaboration between WCRP and MAIRS. This project not only coordinated joint actions among CORDEX Asia groups on simulation design, model validation and data sharing—more importantly, it facilitated a series of workshops intended for capacity building and involvement of young scientists. The first workshop was held in Kathmandu on 27–30 August 2013, wherein there were 40 young scientists among the 75 participants who attended the science and training workshop. The second science and training workshop was held on 17–20 November 2014 at Citeko Bogor, Indonesia, with 35 young scientists out of 65 total participants.

The International Conference on Regional Climate – CORDEX 2013, held in Brussels, Belgium on 4–7 November 2013, was jointly organised by WCRP, the European Commission (EC) and the Intergovernmental Panel on Climate Change (IPCC). The event brought together the international community of regional climate scientists and stakeholders with a particular emphasis on the production, assessment and use of regional climate information. From a total of about 500 participants from 97 countries, 19 early career scientists participated in the conference through support from APN's Scientific Capacity Building and Enhancement for Sustainable Development in Developing Countries (CAPABLE) Programme (CBA2013-04NSY-WCRP).

The first day of the conference featured two important events: a High Level Session with the participation of the European Commissioners for Research & Innovation and for Climate Action, where the Intergovernmental Panel on Climate Change (IPCC) presented key findings from the IPCC Working Group I Contribution to the Fifth Assessment Report Climate Change 2013: The Physical Science Basis. This was followed by a Stakeholder Dialogue session focusing on how science-based regional climate information can best serve the needs of regional policy and decision-makers. This segment was intended to provide the global to regional socio-economic and policy context within which WCRP regional climate research activities and programmes operate.

The second segment of the conference, during the following three days, was organised around the key scientific outcomes from Phase I of the CORDEX project, encompassing results from all the participating regions worldwide. This segment was designed to deliver on the current status and needs of regional climate science and modelling; to strengthen collaboration and synergies between the various CORDEX regional activities; to outline the future priorities for regional climate science, in particular CORDEX phase II by collaboration with regional and global initiatives such as UN Global Framework for Climate Services (GFCS), Future Earth (FE) and IPCC. The breadth and depth of oral and poster presentations illustrated the relevance of CORDEX on the climate change agenda and the expected contribution to impacts, vulnerability and adaptation applications in areas such as water availability, agriculture and food security, health, and disaster risk reduction. The segment also featured a dedicated Early Career Scientist event to strengthen the CORDEX networking and collaborations in regional climate science. This important issue is being promoted more generally now within WCRP by leveraging the wider Young Earth System Scientists Community (YESS).

## Providing Platform for Young Scientists' Work

The second Young Scientists Meeting (YSM) of PAGES was held from 11–16 February 2013 in Goa, India, as a prelude to the subsequent 4th Open Science Meeting (OSM). These two coupled meetings are PAGES's premier scientific events, held once every four years and geared toward helping the best young and established scientists advance their scientific skills and build international networks with peers and programme representatives.

The generous co-sponsorship of the APN (through CBA2012-18NSY-PAGES) enabled 25 early-career researchers from the Asia-Pacific region to participate in the YSM and afterwards mingle with their more established colleagues at the OSM.

The event was aimed at building capacity for young and established scientists in the Asia-Pacific region and fostering scientific exchange and collaboration internationally. Event highlights included scientific sessions on ongoing paleoclimatic and paleoenvironmental research; strategic debates on future research requirements and their implementation; dissemination and outreach through scientific publications and reports, videos, and downloadable materials; networking via poster sessions, breakout discussions, social events, and post-meeting projects; and knowledge transfer through scientific sessions, professional skill development, and presentation feedback.

## Young Scientists' Involvement in Transdisciplinary Research

The MAIRS Open Science Conference from 7–10 April 2014 in Beijing (by support of CBA2013-12NSY-MAIRS) gathered 260 participants from 24 countries, half of which are young scientists. Scientists from agriculture, chemistry, climate, ecology, economics, energy, geography, hydrology, remote sensing and social science reported on the recent progress of their work on sustainability research. Many early career scientists were encouraged to give oral presentations as a part of the conference. MAIRS conference provided a good opportunity and platform for young scientists to meet various people from different disciplines and build networks with global change and sustainability research groups.

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### PROJECT INFORMATION

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