

## Connecting researchers in the Himalaya – institutionalizing a mechanism of active and sustained interaction\*

Recognizing the importance of the Himalayan ecosystem for ecological security of the country, India's National Action Plan on Climate Change (NAPCC) has launched a National Mission on Sustaining the Himalayan Ecosystem (NMSHE), the only area-specific mission among eight such National Missions<sup>1</sup>. The aim of the mission is to have: (i) coherent datasets across diverse disciplines, (ii) effective monitoring system for long-term uninterrupted data flow, (iii) validation of climate model projections, and (iv) sensitized and skilled stakeholders. While taking stock of the research in the Himalaya, the workshop on 'Mountain Specific Research in the Context of Himalaya', held at the Indian National Science Academy (INSA), New Delhi during November 2013 emphasized the need for urgent action to strengthen multidisciplinary and interdisciplinary research culture in the Himalaya<sup>2</sup>.

Realizing this need, the G.B. Pant Institute of Himalayan Environment and Development (GBPIHED), Almora has launched the 'Himalayan Young Researchers' Forum (HimYRF) with the aim to (i) ensure engagement of young researchers in establishing interdisciplinary dialogue, (ii) motivate and inspire young scientists to pursue quality research, (iii) develop a well-informed and enlightened constituency of stakeholders to act as future research leaders in the Indian Himalayan region (IHR). In the First meeting budding researchers from diverse disciplines and across the IHR came together to (i) discuss the ongoing research in different disciplines, (ii) gain insight into new research approaches and (iii) identify synergies for partnership building and future collaborations.

In his welcome address P. P. Dhyani (GBPIHED), explained how the vastness,

biophysical diversity, and continuously evolving Himalaya have made it special among the global mountains. He encouraged the participants to use this opportunity for establishing a strong network of researchers to bring about transformation in research culture in the region. R. S. Rawal (Convener of the meet), emphasized the need for developing a functional knowledge network of the Himalayan young researchers (HimYR) that helps in generating and exchanging datasets on diverse aspects. One of the expert mentors, R. R. Rao (Bengaluru), expressed concern on the declining number of dedicated scientists in field-oriented subjects like plant taxonomy, and underlined the need for promoting basic field-based research. Resource persons of the event, Sarnam Singh (IIRS, Dehradun) and G. S. Rawat (WII, Dehradun), emphasized the need for intensive research in different disciplines to help in building strategies for sustainable development and environmental conservation in IHR. The chief guest, S. P. Singh (Forest Research Institute, Dehradun), appreciated GBPIHED's efforts to follow-up with recommendations of an earlier event held at INSA. Mentioning the meet as a unique event, he urged the participants to use this opportunity and put together all their energies for meaningful research that leads to ecologically agreeable development in the region.

Four concurrent sessions under theme 'Explore' were held. Each participant provided inputs on five key points: (i) motivation for joining research, (ii) pertinent research questions, (iii) relevance of research for environment and development, (iv) major challenges and constraints, and (v) visualization about the YRF. Curiosity about understanding the natural processes, cultural realities, concern for environment and society, career building and innovative aptitude, perpetuation of family traditions, inspiration from eminent scientists and scientific conferences and subject-specific curiosities emerged as key factors that motivate the young generation to pursue research. Their research questions were subject-

specific and broadly focused on biodiversity assessment and conservation, understanding and conservation of culture and traditional knowledge. Factors mentioned as major challenges for research in the Himalaya include harsh geographic and climatic conditions, inaccessibility to field sites, inadequate technical knowledge, limited laboratory facilities, lack of skill-building opportunities, funds and proper guidance, etc. Participants perceived YRF as an excellent platform for sharing knowledge and experience and promotion of quality research culture. The lead lecture by S. P. Singh on 'Communicating research and making research proposals' explained fundamentals of writing and communicating research findings.

Theme 'integrate' targeted establishment of connection between diverse academic disciplines, professions, and/or technologies, along with their specific perspectives, for achieving common goal. R. R. Rao deliberated on 'Emerging challenges in field oriented taxonomy and ethnobotany disciplines'. He suggested integration of interdisciplinary programmes to make the subject fascinating to young minds. Deliberations in three parallel sessions, which covered domains of biophysical, socio-cultural and economic, and technological intervention, helped participants understand (i) basic philosophy and overall value of interdisciplinary research, (ii) possibilities of connecting various disciplines for addressing larger issues, and (iii) the importance of integration for achieving common goals.

Under theme 'experience' an excursion was organized to Binsar Wildlife Sanctuary, which provided an opportunity for learning in an interdisciplinary setting and enabled the participants to understand the linkages between human habitations and surrounding wilderness.

An open discussion session, chaired by S. P. Singh concluded: (i) consensus for development of a functional network of HimYR, (ii) emphasis on organizational support towards fostering stronger

\*A report on the first meet of Himalayan Young Researchers organized by G.B. Pant Institute of Himalayan Environment and Development, and the Indian Himalayan Climate Adaptation Programme, SDC, at Kosi-Katarmal, Almora during 7 to 9 September 2014.

linkages, (iii) underlining the need for better synthesis and adequate dissemination of knowledge available on multiple subjects, (iv) creation of a web-based platform (<http://gbpihedenvi.nic.in/Him-YRF-2014>) as a beginning of knowledge network and for sharing of information, and (v) request GBPIHED or any other organization to continue providing base support for organizing similar meets.

A total of 74 young researchers (24 women, 50 men), representing 30 institu-

tions across 12 Indian Himalayan states, and engaged in research in diverse disciplines, attended the meet. Selected senior mentors and resource persons were drawn from various organizations to facilitate and moderate the proceedings of the meet.

1. National Action Plan on Climate Change, GoI, 2008; <http://pmindia.nic.in/pg01-52.pdf>

2. Negi, G. C. S., Rawal, R. S., Sharma, S., Kumar, K. and Dhyani, P. P., *Curr. Sci.*, 2014, **106**(5), 659–660.

**Ranbeer S. Rawal, Rajesh Joshi, Indra D. Bhatt\***, Subrat Sharma, Ranjan Joshi, Vasudha Agnihotri, K. C. Sekar and P. P. Dhyani, G.B. Pant Institute of Himalayan Environment and Development, Kosi-Katarmal, Almora 263 643, India.

\*e-mail: id\_bhatt@yahoo.com

## MEETING REPORT

### MP-TRACS crops\*

Climate change will have a major impact on agriculture in tropical countries like India. However, these impacts are highly crop-specific, and climate projections for impact assessment and adaptation need to be considered at the precision, accuracy and reliability required for a given class of crops. Unfortunately, very little is known in this regard for the economically important crops characterized by secondary metabolites, like tea, rubber, aromatic and medicinal plants, coffee and spices (TRACS). While efforts are on at several national agencies, the critical issues of the methodology for adopting climate change scenarios, and interfacing with crop processes, have not yet received the required attention. Further, such assessments need to be integrated with all the major components like crop, pollinator, disease and constraints due to primary resources as well as demand. These issues are particularly acute for TRACS crops. Thus, there is need for an integrated decision support system for such crops.

A national discussion meeting was therefore organized with the primary goal of creating a common platform of knowledge synergy for addressing outstanding issues related to modelling and projections for the special class of TRACS crops. Seven organizations participated

in the meeting, with the following broad themes for discussion: (a) Enhanced production of TRACS crops with immediate and tangible benefits to farmers. (b) Enhancing sustainability and eco-compatibility of TRACS crops under different scenarios of climate change in the next 50 years. (c) Development of a comprehensive and integrated decision support system for TRACS crops.

The importance of the topic of the meeting was put in clear perspective by P. S. Ahuja (CSIR), in his inaugural address. Highlighting some of the major national initiatives by CSIR and other agencies like Indian Council of Agricultural Research (ICAR) in the areas of crop and ecosystem modelling, Ahuja emphasized the need for initiating a multi-sectorial and multidisciplinary approach for modelling and projection of agro-economic crops through a core group of scientists. In this context he appreciated the participation by a large number of delegates representing different agencies and domains, and the sizable participation of scientists from C-MMACS (CSIR-4PI), Bengaluru and the holistic nature of the proposed programme. He particularly emphasized data coverage, data quality and accurate forecasting for crop management. Noting that modelling has assumed a critical role essentially in all branches of science and engineering, Shyam Chetty (C-MMACS and NAL, Bengaluru) emphasized the intricacies involved in modelling complex systems like crop-climate processes. He emphasized the need for a core group like the one assembled for the meeting to provide

India with unique advantages through an effective national collaborative programme.

In his overview of the objective and approach of the meeting, P. Goswami (C-MMACS) briefly traced the major events leading to the current event, beginning with the presentation to the Planning Commission (in January, 2011) on a Network Initiative on Sustainability, Climate Adaptation and Mitigation. He also emphasized that the C-MMACS team had developed several process models like crop disease (capsule rot of cardamom), malaria and energy; these models, including their computer codes, have been developed in-house and the results published in high-impact journals like *PLoS ONE* and *Nature Scientific Report*. He identified creation of reliable and crop-specific climate projections at regional level in India as the biggest challenge and the most critical gap. In the long term, a critical need is mapping of changes in geographical distribution of potential areas of TRACS production under climate change; in the short term, new and improved technologies need to be identified and incorporated.

The meeting then discussed the major themes for a comprehensive programme; the deliberations under these sessions are outlined below.

In the session ‘climate change: issues and challenges in spices, aromatic and medicinal crops’ several scientists highlighted critical and specific issues related to spices and aromatic and medicinal crops. Ajay Divakaran (Indian Cardamom Research Institute (ICRI), Kailasanadu)

A report on the National Discussion Meeting on Modelling and Projections for Spices, Aromatic and Medicinal Plants, Coffee and Tea held at the CSIR Centre for Mathematical Modelling and Computer Simulation (Repositioned as CSIR-4PI), Bengaluru.