

## NEED FOR STRENGTHENING SOCIETAL INTERFACE OF ENVIRONMENTAL SCIENCE RESEARCH IN THE INDIAN HIMALAYAN REGION

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Ecology is the science that elicits the functional interrelationships among the organisms and between the different components of environment. Environment not only comprises the life-support system for biological organisms, but is also a system of interacting resource sub-systems having socio-economic and cultural dimensions. In the context of the Indian Himalayan region (IHR) it may be pointed out that due to unplanned exploitation of natural resources in the geotectonically fragile and ecologically sensitive mountain ecosystem a number of environmental problems such as degradation of vegetation, invasion of weeds, landslides, soil erosion, floods, drying up of water sources, forest fires, etc. have cropped up. It is not known whether they are of natural origin or due to human interference but it is certain that man-made disturbance has increased the magnitude of these environmental problems. Climate change has added a new stress to ecosystems and socio-economic systems. The environmental problems in the Himalaya are complex, having intricate linkages between social, economic and ecological dimensions. The solutions, therefore, cannot be addressed in isolation. It is apparent that sectoral practices of management (also development) will not work, and therefore, a holistic approach consistent with ecological and social principles needs to be applied, which is grounded on man's delicate relationship with nature.

Academicians and scholars across the Nation and IHR and also from various parts of the globe drew attention to the environmental problems of Himalaya being a unique system on the earth and storehouse of not only freshwater, unique biodiversity but also human culture and source of inspiration for people. The World Summit on Sustainable Development (Johannesburg, August 2002) and Bishkek Global Mountain Summit (October 2002) arrived at a consensus that mountains would require specific approaches and resources for sustaining livelihood needs and improving the quality of

life. This would require an integrated approach, which gives due consideration to closely intertwined aspects of human socio-cultural/socio-economic systems and natural ecosystem components/processes.

Ecological and environmental sciences research in the IHR dates back to the British past with the landmark work of Brandis (1897), Troup (1921), Osmaston (1927) on forests; Heim and Gansser (1939) on Geology; and the Himalayan Gazetteer of Atkinson (reprint 1973) on nature and society interactions; that are still relevant today and serve as an important base reference material. Revisiting the historical progression of ecological and environmental research in the IHR it can be inferred that knowledge base has evolved over the years for eco-systems such as forests, grasslands, agriculture and water resources, including aquatic life, and found place in text books and monographs subsequently and utilized in developing school/University curriculum. The sectoral domains of research were then gradually transformed into multidisciplinary research in which integration of different components of ecosystem was attempted with an in-depth enquiry into various structural and functional aspects of these ecosystems (Singh and Singh, 1992). Dimensions such as carbon sequestration, climate change, ecosystem services, indigenous knowledge, participatory natural resource management planning, land use land cover change, weed invasion, capacity building of rural people (particularly women), value addition and marketing of farm products, etc. were attempted by scientific community with varying degree of vigour and success. And these studies that are being undertaken in recent years have, to a large extent been driven by contemporary areas of local, regional, national and international concern and commitments. Significant attempts have also been made to demonstrate the R&D outcome in the diverse field situation to sensitize people and invite feedback of stakeholders to ensure science-society interface. In this way there has been a

paradigm shift from lab-based science to science that takes care of societal concerns. For example, the forest-dwellers those were earlier viewed as destroyers of forests are now regarded as the real custodians of diversity and harbingers of indigenous knowledge useful for conservation and sustainable management of natural resources. The approach has been, and hopefully will continue to be, interdisciplinary and multidimensional. In these R&D efforts emphasis has been given to network with other potential players to utilize the synergy in the best interest of a variety of stakeholders.

The larger challenge still remains as to how to make the R&D work more utilizable by the society? Also what has been the magnitude of utilization of research results and its implications is a matter of concern? There is a strong need to find out ways and means for taking up the research results in policy making. In many instances it appears that research papers published contain limited useful information that already exists with the society. In this context it is difficult to deny the view point of many NGOs who often raise concern that research carried out is not meeting the societal demand adequately. Also sometime the policy makers hold the similar view? Scientists, however claim that in many aspects their research results are useful but it is the domain of the policy makers and planners to implement and upscale it. Learning from some of these instances “stakeholders demand-driven research” has been promoted by many institutions to established an interface with the society. Thus, how the scientific community can be made more accountable to the societal concerns should to be the main aim of R&D pursuits today?

The fundamental basis of ecological and environmental sciences is grounded upon a holistic ecosystem based approach rather than sectoral one as holds in case of other subjects of science. A system thinking is therefore required while conceptualizing and designing research programmes aiming at natural resource management for human well-being without disturbing the ecological balance. It will then need interdisciplinary and multidisciplinary building blocks to come up with science-based solutions to environmental problems and to make research useful for the society. Often due to lack of expertise and multidisciplinary vision most of the good research and hard earned experimental data remain confined to research papers and bookshelves. As a consequence, much needed societal link is broken and hard efforts put by researchers fail to yield desirable results.

While thinking of this lacunae, one also need to consider the constraints our researchers and scientific community is confronted with; such as mentorship support, funds and infrastructure facilities (Negi *et al.*, 2014).

In the modern acquisitive society 'economy' gets priority over 'ecology'. There is need to evolve a new paradigm to restore balance between economic interests and ecological imperatives. Economic, ecological and socio-cultural indicators for quality of life should be considered as: Solutions to the ecological and economic problems in the IHR are to be sought within the permissibility of mountain specificities and adaptability of people, which is governed by socio-cultural principles.

Research work need to be guided by such a philosophy that the results are utilizable by the society for gross national happiness as has been the philosophy of our neighbouring country Bhutan (Adler 2009).

## References

- Adler AA (2009). Gross National Happiness in Bhutan: A Living Example of an Alternative Approach to Progress. *Social Impact Research Experience (SIRE)*, 1: 1-137.
- Atkinson AE (Reprint 1973). The Himalayan Gazetteer. 1(2), *Cosmo Publications*.
- Brandis D (1897). Indian Forestry, Oriental Institute, Woking UK, 2-16.
- Heim A, Gansser A (1939). The Central Himalayas-Geological observations of the Swiss Expedition of 1936. *Memoires de la Societe Helvetique des Sciences Naturalles*, 73: 245.
- Negi GCS, Rawal RS, Sharma S, Kumar K, Dhyani PP (2014). Need for strengthening mountain-specific research. *Current Science*, 106 (5): 659-661.
- Osmaston AE (1927). A Forest Flora of Kumaun. *Govt. Press. Allahabad*, 1-649.
- Singh JS, Singh SP (1992). Forests of Himalaya: Structure, Function and Impact of Man. *Gyanodaya Publication*, Nainital, India, 204-224.
- Troup RS (1921). The Silviculture of Indian Trees. *University Press, Oxford*, 1(2):1- 606.