

## Development dilemma for the North East Region of India\*

India's North East Region (NER) 'a rainbow country, extraordinarily diverse and colourful' includes the seven sisters – Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura, along with a small and beautiful cousin in the Himalayan fringes, namely Sikkim covering an area of 262,189 sq. km and constituting about 7.98% of the country's total geographical area. The region has a long international boundary, about 96%, with China and Bhutan in the north, Myanmar in the east, Nepal in the west, and Bangladesh in the south and west. The region represents nearly 3.8% of the total human population of the country and exhibits a great diversity of ethnic groups. Estimated 171 out of a total 573 scheduled tribes in India inhabit the remote, inhospitable terrains in NER. The significant linguistic, ethnic and cultural diversity, not only among the people of different states, but also within each state in the region, is an important feature that needs to be taken into account in designing policies and programmes. The region is home to over 200 of the 635 tribal groups in the country, speaking about 220 dialects with a strong tradition of social and cultural identity. The region is predominantly rural with over 84% of the population living outside towns and cities, except in Mizoram where about half the population lives in the villages.

The NER with complex topography and elevation ranging from 300 m to 8000 m creates diverse bioclimatic zones – tropical, subtropical, lower temperate, upper temperate, subalpine evergreen, alpine evergreen, alpine shrubs and meadows and island-like conditions. Over an average forest cover of 75%, NER contains more than one-third of India's biodiversity and represents the Himalayan and the Indo-Burma global biodiversity hotspot. This region harbours the largest number of endemics and Schedule I species compared to any

other part of India. Located at the tri-junction of Indo-Chinese, Indo-Malayan and Palaearctic biogeographic realms, the region is rich in medicinal plants and many other rare and endangered taxa. Its high endemism in higher plants, vertebrates and avian diversity has qualified it to be a 'mega biodiversity hotspot'. The biological richness of the region could be gauged from the fact that it harbours the highest mammalian and avifauna diversity in India with more than 250 mammalian and 836 avifauna species out of 1200 found in India. According to the Indian *Red Data Book*, 800 species of endangered flowering plants are reported from the region, which accounts for 55% of the country. Out of the total birds species, 24 species have restricted range confined to the NER. Known to be the cradle of angiosperms, it harbours about 8,000 (53.34%) species of angiosperms out of 15,000 known from the Indian region. Of the estimated 800 species consumed as edible plants in India, nearly 300 species occur in the NER. Out of 1200 species of orchids found in India, the region contributes about 700 species or 58.34%. In the case of genus *Rhododendron* (family Ericaceae), nearly 98% (71 species) of the country has representation in the NER. Among the 136 species of bamboos found in India, 63 species in 22 genera are found in the NER. Reports indicate that the NER is also probably the lowest greenhouse gas emitting region, and forests of the NER sequester highest quantity of carbon in the country.

Despite being the cradle of biological and cultural diversity, the NER suffers from development and conservation deficit. The common development challenges include inadequate options for livelihood and policy deficiency in the promotion of alternative and innovative livelihoods; lack of appropriate technologies that are simple, low-cost and accessible, non-integration of modern technologies with traditional knowledge, innovation and practices (TKIP); disappearance of ethnic knowledge base (folk culture, totem and taboos, religion, etc.) in resources conservation and sustainable livelihood; non-documentation of best practices of

ethnic communities in resource management and conservation; lack of marketing, buying guarantee for produce and suitable transporting media; inadequate Environmental Impact Assessment (EIA) of hydropower projects and non-consideration of risk assessment as an integral part of EIA; climate change vis-à-vis development projects; drying up of water sources and streams impacting livelihood such as agriculture; inadequate infrastructure for human resource development, and proper training in potential sectors like ecotourism, etc. The major challenges of biodiversity management include incomplete documentation and inventory development of biodiversity and deficient database; hunting/poaching, illegal trade of wild flora and fauna, over-exploitation of terrestrial and aquatic biodiversity and consequent threat to endangered, rare and threatened (ERT) and habitation of immigrants in protected areas; shifting cultivation with short fallow period, and natural resource degradation.

In order to brain storm and find out possible solutions to develop the NER and conserve its rich biological and cultural resources, G.B. Pant Institute of Himalayan Environment and Development (GBPIHED), North East Unit, Itanagar, organized a meeting. Over 100 participants, including academicians and researchers from universities and other institutions, teachers and students from schools, general public, representatives from state government departments, central and state institutions and NGOs attended the meeting. Tamo Mibang (Vice Chancellor, Rajiv Gandhi University, Arunachal Pradesh), delivered the 'First popular lecture of GBPIHED-NE Unit' entitled 'Do we struggle for development'. He highlighted that the course of development has been an arduous one, and culture of the communities through a code of unwritten laws has maintained a symbiotic relation with nature. Emphasizing on the concept of bottom-up approach of development, he highlighted that local populace should first decide how best to exploit the resources so that the country benefits and they also gain accordingly. Local people should be the

\*A report on the meeting organized by the G.B. Pant Institute of Himalayan Environmental and Development, North East Unit, Itanagar, on the occasion of its Annual Day on 10 September 2014.

major decision-makers in the use and conservation of the natural resources around them and a balanced approach is essential for safe-guarding the national interests and welfare of the people. The national interest, he observed, is to protect the territorial integrity of the nation and promote economic development. Major concerns for development, according to Mibang, are imbalance in developing new economic regions, inappropriate planning, rapacious approach to natural resources that ignores the customary laws evolved over centuries to sustain them for posterity. When communities apprehend danger of misappropriation of their natural resources, they show resistance. Mibang further underlined that the state bears the responsibility for creating normal living conditions for the people, conserve and rationally use the natural resources for an inclusive development that ensures preservation of culture. He also voiced his concerns over the poor representation of people from the NER in Parliament, suggesting that a better representation will ensure more development in the region.

Ramesh Negi (Chief Secretary of Arunachal Pradesh) remarked that the natural resources are facing challenges from the point of their use and conservation. He observed that over the centuries, changing priorities of humans and their lifestyle, are dislocating the symbiotic relation between communities and the environment. Therefore, a continued intellectual debate among stakeholders, i.e. communities, academicians, researchers, planners, administrators and civil societies is essential for appropriate policies and plans for development. He observed that contradictions in the society for environment and development while bal-

ancing profit and greed are the important decisions to be made, the traditional value system, which imbibes cultural values should be strengthened for a well-framed developmental approach. Cultural values, Negi stressed, are the major strength for development of a society. Omkar Singh (Department of Environment and Forests, Government of Arunachal Pradesh) mentioned that a more articulate interaction between communities and planning bodies is required for effective conservation and development. Community participation and suggestions, he remarked, play an important role in conservation projects. Emphasizing on the rich biodiversity of the NER and the need for inventorying the biodiversity of the region, P. K. Samal (GBPIHED, North East Unit) mentioned that discovery of new species is common in the region and the Unit itself has discovered four new species of fishes *Erethistoides senkhiensis*, *Glyptothorax dikrongensis*, *Pseudolaguvia viriosa* and *Garra magnidiscus*, during the last 5–6 years.

The participants in the deliberations agreed that development paradigm in the NER must focus on sustainable socioeconomic development and livelihood security, conservation of biological diversity and ecological security, adaptation/mitigation of climate change impacts and developing appropriate policy and stakeholder's need-based research and capacity building. Further, the gap between the region and the rest of the country in terms of various developmental outcomes, productivities and capacities of people and institutions is large and growing, and has to be bridged. Even within the region, there are vast differences, particularly between populations living in the hills and the plains, and

between those living in the towns and villages. Given the vast disparities within the region, a development strategy will have to be evolved depending upon prevailing resources, conditions and needs and priorities of the people. Further, the development strategy for the various tribes in the region will have to be participatory and should be calibrated in their own setting. The long-term vision of development, therefore, will include biodiversity conservation and sustainable development through facilitation and strengthening of community initiatives. The envisaged initiatives will keep in view practical methodologies for addressing ecological concerns through appropriate technological interventions, enhanced livelihoods for local communities and development of protocols to economically benefit the locals from wildlife conservation so as to promote long-term commitment towards biodiversity conservation. Focus should also be on enhanced capacity, engagement and cooperation of local communities and community institutions in biodiversity conservation to 'ensure environmental sustainability', one of the eight renewed commitments to human development adopted in the Millennium Declaration of 2000 by the member states of the United Nations. The approach should also necessitate wider networking with organizations, institutions, government departments and bodies and credible NGOs working in the region.

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## MEETING REPORT

### Ecosystem monitoring and forest census studies in South Asia\*

Intact tropical forests cover 13.9 million sq. km worldwide, or 24% of tropical land area. They are the most productive terrestrial ecosystems on Earth<sup>1</sup> with

\*A report on 'Ecosystem Monitoring and Forest Census Research in South Asia' held on 19 and 20 May 2014 at the National Centre for Biological Sciences, Bengaluru.

high priorities for biodiversity conservation<sup>2</sup>. These forests store a substantial amount of carbon in biomass and soil, and they also regulate the transfer of carbon into the atmosphere as carbon dioxide (CO<sub>2</sub>) (Figure 1). Knowledge of the sign and magnitude of the stocks and flows of carbon and biomass within global forests is of importance in the

context of climate change<sup>2</sup>. Intact tropical forests in Amazonia and Africa have been increasing in biomass and thereby absorbing ~12% of current anthropogenic CO<sub>2</sub> emissions, but the continuity of this biomass carbon sink remains uncertain<sup>1,2</sup>.

The contribution of South Asian ecosystems to the global carbon budget is