



Climate Change Based Disaster Management Through IEC Approach in North East Indian Region

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ABSTRACT

Climate change shall induce different consequences and disaster in North East India during coming next three decades with the possibility of increasing average temperature from 1 to 2 0C. Key sectors for vulnerability in disaster include water, agriculture, human health and changes in forest (60 % area) cover. Due to topography of area, land forms, difficult and uneven terrain in different states, the impacts shall be more severe in North East India. Effective intervention, education & communication (IEC) tool can be extremely useful for climate change based disaster management because people and community members can prepare themselves against disaster. Water cycle is associated with flood and drought which in turn shall affect agriculture production as 60 % crop area is under rain fed. Vector borne diseases like malaria and dengue shall cover more and more area simultaneously. Disaster induced by climate change shall have more impacts because by enlarge tribal population is economically poor in the region.

KEYWORDS : climate change, water cycle, disaster, flood, drought, agriculture production,

INTRODUCTION

Effective intervention, education & communication (IEC) is useful in all environmental problems. India's North Eastern Region (NER) is a compact land mass which contributes substantially in terms of forest resources to the national average of forest cover of 23.9%. North Eastern Region is critical from climate change perspective as more than two-third of population in the target States (Assam, Meghalaya, Mizoram, Nagaland and Sikkim) is basically rural and depend on climate-sensitive natural resources such as agriculture, forest biodiversity and water availability. While Mitigation strategies have not yet taken off in NER, adaptation measures have been initiated [1-5] under the aegis of Indo-German cooperation in association with German International Cooperation (GIZ). Since the 1950s, near-surface global temperatures have increased by about 0.5-0.6°C[6], and it is likely that temperatures will continue to increase over the next century [7].

Climate predictions about humidity and precipitation are more uncertain than temperature projections [8]. The North-eastern region of India is an earthquake prone area. The region has experienced a large number of earthquakes of tectonic origin. The risk probabilities of earthquake are less over the entire Brahmaputra valley. The region of Northeast India is seismically very active. Two major earthquakes (of magnitude 8.7 occurred in 1897 and magnitude 8.6 in 1950) causing large scale damage of lives and properties in North East Indian region. It is well established that ecological degradation leads to loss of biodiversity, resources, soil [9-14].

METHODOLOGY

To prepare this policy research paper, many journals, research papers, policy papers, reports, data from different Ministries, agencies, internet and other sources were collected and analyzed to assess the environmental problems associated with ecosystem degradation and climate change issues at different level to strengthen adaptive capacities of target groups, therewith reducing their vulnerability to Climate Change in a target-oriented manner. In all selected districts of the participating States, the objective is for establishment of appropriate selection and planning mechanism of adaptation measures; implementation of selected adaptation measures; and support of mainstreaming of climate change awareness at all levels of government.

ASSOCIATED PROBLEMS

There are many problems which are associated with ecosystem degradation and climate change; and these problems leads to disasters directly or indirectly. Deforestation may enhance the carbon component in atmosphere. In spite of the existence of several forest laws and regulation the forest of North-East is decaying. The ramp at felling of trees in Bodoland areas by the Bodo-militants, in Karbi Anglog by Karbi-militant groups and in other parts of Assam and North East reduce the forest cover below 25% which was earlier more than standard requirement of 33%.

The reduced habitat of wildlife and shrinking ecosystems by forest degradation also favours other problems like illegal poaching and trade of wildlife. The killing of rhinoceros for their horn and of elephants for their ivory by the poachers with the help of greedy forest officials is a common phenomenon which is a great threat to existence of endangered rhinoceros in Assam. Another problem in the region is flood. Almost entire Assam get submerged twice or thrice yearly due to flood resulting loss of life and property.

Flood causes severe damage to ecology, environment and other disasters like landslide. Hundreds of wild animal including deers and rhinoceros' calves living in the Kaziranga National Park loss their lives in the stream of Brahmaputra every year due to flood. The river island 'Majuli' is losing several hectares of land to the water of Brahmaputra every year, thus the very existence of the island is under threat. The major cities and town including Guwahati get submerged during flood and the municipal and other waste spread over the land causing several health hazards. Flood has serious negative impacts in economic development in the region.

Climate change has dramatic impacts on natural resources, economic activities, food security, health and physical infrastructure. India is one of the countries most strongly affected by climate change. The threat is especially great wherever people's livelihoods are particularly dependent on natural resources. In these vulnerable areas, climate adaptation measures are of central importance for the protection of rural livelihoods and for ensuring sustainable development. The North Eastern Region of India comprises the 'Seven Sister States' of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura, plus the 'Brother' state of Sikkim. The region is a global biodiversity hotspot, as well as being home to many different ethnic groups with a rich cultural heritage and traditional knowledge of the environment.

IMPACTS AND CONSEQUENCES

India should be concerned about climate change since this would have serious adverse impacts on agriculture, livelihood; sea level rise leading to submergence of highly productive coastal areas; increased frequency of extreme events like cyclones, floods, droughts etc; water resources. Vulnerability is increasing with rising population, haphazard urbanization, developments in high-risk zones, environmental degradation, climate change etc.

India is vulnerable to a large number of disasters due to approximately 60% of the landmass is prone to earthquakes, 12% (about 40 million hectares of land) is prone to flood and river erosion, 68% of the cultivable area is vulnerable to drought/ landslides/ avalanches, about 5770 km of coastline out of a total 7516 km is prone to cyclone and tsunami. National Disaster Management Authority under the provisions of The Disaster Management Act 2005 brought into the Authority at National level the Act lays down institutional and coordination mechanisms at the National, State, District and Local levels and provides for establishment of Disaster Response & Mitigation Funds.

EFFECTIVE STRATEGIES

Advice and cooperation arrangement between the governments of India and other agencies/ Government or partner NGO can play extremely important role for good governance to execute action plan. Working with the Ministry of Development of North Eastern Region (MoDoNER) at the national level, it supports the three North-Eastern states in their efforts to enhance the climate resilience of rural communities. The regional project partners are the State Planning Department in Meghalaya, the Nagaland Empowerment of People through Economic Development and the Department of Science, Technology and Climate Change in Sikkim. Important inputs may be policy advice at the state level, to direct community level support and the creation of partnerships and networks in the region and beyond.

Capacity building, human resources development, preparation and assistance in implementing State Action Plans on Climate Change, drafting of a water policy in Meghalaya, spring-shed development and the preparation of village water security plans in Tendong Hill region (Sikkim), support for the cultivation of indigenous rice varieties in Meghalaya and Nagaland, improvement of Eri silk production in Meghalaya can also be highly recommended steps and strategies. Studies on the regeneration, conservation and sustainable management of oak forests in Sikkim; inputs for the integrated management of land and water resources in the Upper Umiam River Basin, Meghalaya; breeding of indigenous fish species in Meghalaya; support for the compilation of climate change relevant data in Meghalaya; training and awareness raising on climate change, at government and community levels shall enhance for execution of action plan in more effective manner.

The overriding immediate concern for India is to prepare a detailed roadmap. With the threat of climate change, India is called upon to change its energy strategy based on coal, its most abundant resource, and to use other energy sources (e.g. oil, gas, renewable and nuclear energy) instead, which may turn out to be expensive. Directly or indirectly these efforts are made by Government as well as by people to reduce energy consumption. These include emphasis on energy conservation; promotion of renewable energy sources; abatement of air pollution; afforestation and wasteland development; economic reforms, subsidy removal and joint ventures in capital goods; fuel substitution policies.

In agriculture sector, adaptation to Climate Change includes new varieties to cop up with drought/heat resistant; new farm management practices; change in land use; watershed management; agriculture insurance etc. Priority areas for research and action must involve generating & creating access to regional climate change projections for North East (NE) India; development of multiple impact models validated for NE Indian conditions; different crops, forest types, regions, etc; need for vulnerability profiles for current climate variability and future climate; generation of data required for impact and vulnerability assessment; research on adaptation strategies for future climate scenarios; capacity building for modeling etc.

CONCLUSIONS

Climate change induce various and multi-dimensional agents for different impacts in ecosystems. The values of four indicators (water availability, flood, drought and evapo-transpiration or crop water demand) are more important for aggregating into water vulnerability index and can be derived using soil and water assessment tool (SWAT). Changed water cycle shall have bearing on unique geo-climatic conditions which in turn shall contribute for flood, erosion, landslide and earthquake also. There is need for prioritizing the identified sectors to make action plan identifying and implementation of adaptation intervention and strategies for achieving resilience in different ecosystems. Remote sensing data coupled with IEC tool shall be helpful to prepare people to combat against induced impacts.

There is need for further research in using climate change and impact assessment data from multiple models to understand better strategies to vulnerability profile development for different districts for effective action plan and decision based intervention approaches. Public and private service providers and rural communities in the North-Eastern states of Meghalaya, Nagaland and Sikkim are undertaking modern strategies for climate change adaptation and can be helpful as additional input in the area.

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