

FOREST CONSERVATION AND CLIMATE CHANGE MITIGATION POTENTIAL THROUGH REDD+ MECHANISM IN MEGHALAYA, NORTH EASTERN INDIA: A REVIEW

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Abstract: Climate change is one of the burning issues in the present days as it has the capacity to affect lives and sustenance on earth. On a global scale there have been a lot of efforts put forward in order to cope with or adapt or simultaneously adapting and coping with slowing down the rate at which climate change is happening. Naturally, earth itself is trying to balance this change by capturing and storing carbon dioxide from the atmosphere as carbon in the soil and forests vegetation biomass. However forests have always been on pressure from the various developmental activities which ultimately reduce their capacity or potential to store carbon. For this purpose, saving forests is an important step in order to tackle climate change. REDD+ one of the steps that emerge in the UNFCCC in order to tackle climate change may possibly helps in saving and improving forests condition which will in turn improve the forests carbon storage capacity and reducing the accumulation of carbon in the atmosphere. Successful implementation of REDD+ in Meghalaya, a state with high percentage of forest cover and people directly involving in both the ownership and utilization of forests can positively lead to successful forest conservation and reducing the rise in the green house gases level and ultimately contributing to combating or mitigating climate change.

Keywords: climate, Climate change, carbon, forests, REDD+

Introduction

Earth is the only known planet where life exists. The continuation of life in this planet depends on the stability of the system often referred to as life supporting system. The climate system of the world is an integral part of this of life-supporting system, and currently this system is under pressure because of the rise in temperature resulting from the trapping of incoming solar radiation by the gases released from various human developmental and economic activities. Maintaining a balance in this life supporting system is important in order that life will continue in this planet. This paper stress on the need to stabilize climate change and one way of doing so is by capturing of carbon in the forests vegetation biomass, conserve and improve the condition of the existing forests whereby it will also contribute to conservation of biodiversity and allowing life to continue side by side with development

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bringing minimal or no change in the supporting system. REDD+ mechanism which stands for Reducing Emission from Deforestation and Forest Degradation is one of the mechanism that comes out in one of the meeting of the UNFCCC (United Nations Framework Convention on Climate Change) can help in tackling and solving these forest related problems and linking them to climate change abatement. This mechanism can act as a bridge that can link the gap existing between forest utilization and forest conservation.

Climate and Climate Change

Climate is usually defined as the average condition of the atmosphere of a particular place for a known episode of time. The term climate cover the various environmental condition of an area like humidity, precipitation (rain or snow), temperature, wind and seasons of the area, place or the whole country. It plays an essential role in structuring the natural ecosystems and various human economy and various activities and societal cultures depend on the pattern of these climatic condition. However, in order to meet the rising demand to fulfill the necessities of human being, the various development activities carried out are affecting the climate and the climate we all expected is not what it used to be, since the past is not a reliable predictor of the future anymore but in fact changing the future. Our climate is changing with non negligible impacts and that change is happening faster than any we have seen in the last 2,000 years.

Changes in the various environmental parameters have been observed more and more as the years pass. Increase or decrease rainfall intensity resulting in more floods or droughts, frequent and severe heat waves have been recorded and experienced in number of places. Oceans ice cap and mountain glaciers have also experienced some serious changes - rising level of acidic, ice caps melting, and sea level rise indicates warming of oceans. These changes are liable to continue and mount in the coming years and are liable to pose numbers of challenges to our society and the whole world. Climate change includes the changes in the various parameters like temperature, precipitation, wind patterns that occur over several decades or longer and posing a threat to the life on earth. These changes are already happening and may continue if no appropriate steps are taken.

Adaptations and Mitigations

Coping and adaptation to climate change is very important for continuing existence of life. In its simplest term, adaptation means to be able to live or cope up with this change. It is an indispensable way of complementing climate change and mitigation strategies. Adaptations mostly bring benefits as well as forming a basis for coping with future changing climate.

Adaptation is not a new trend, indeed, throughout history, human society are shifting settlement and altering agricultural practices and other facets of their economies and lifestyle in order to adapt to natural climate variation. Human capability to adapt and cope with climate change is determined by many factors such as technology used, education level, and the accessibility of resources. Local knowledge is the basis for decision-making in many rural communities as incorporation of indigenous knowledge into climate change policies can lead to the development of effective adaptation strategies that are cost-effective, sustainable and participative. Successful adaptation to climate change depend heavily on available development options and choices, a higher level of development is likely to produce greater adaptive capability, but certain route of development can undermine these advances by exposing populations to higher levels of climate risk.

Mitigation or slowing down the rate at which this change is happening and the reduction in the emission of green house gases side by side while adapting to it can be a more success way of combating and adapting to this change. Mitigation can be meet using completely new and more environmentally technologies and renewable energy sources, upgrading or replacing of older energy inefficient equipments with energy efficient ones, or simply by changing old behavior or management practices. Simultaneously, adapting while mitigating climate change is needed in order to successfully abate or control and survive this change. The duos are like the two faces of a coin that make the whole process complete and successful.

The Kyoto Protocol

Kyoto Protocol is an international agreement which is linked to the UNFCCC in order to reduce the emission of the green house gases and help countries achieve or reach their emission reduction targets. This certain degree of flexibility mechanisms has been set up under this protocol, The Clean Development Mechanism (CDM), is the primary international offset program existing today, although not perfect, however it has helped to establish a global market for greenhouse gas (GHG) emission reductions.

The concepts of REDD+ emerges in one of the conference of the UNFCCC that focus on deforestation and its contribution to climate change. REDD+ is a large scale undertaking in order to encourage developing countries to protect, manage and sustainably utilise their forest resources and accordingly contribute in the global fight to climate change. The mechanisms extend further than reducing deforestation and degradation and covering upbeat elements of conservation, sustainably managing the forests and improving or enhancing the forest carbon storing capacity. With the concept of REDD+, it became clear that a REDD+ mechanism can

deliver multiple benefits to the environment as well as to the people. Initially most REDD+ programs and projects evolved from earlier efforts to reduce deforestation for non-climate reasons, such as biodiversity, wildlife, ecotourism, and poverty alleviation. But as the global concern about climate change has grown in recent years, REDD+ has taken on an explicit climate focus, with an emphasis on reducing emissions and compensation linked to verified emission reductions and increase carbon sequestration. In addition to mitigating climate change, REDD+ can support livelihoods, maintain fundamental ecosystem services and preserve globally significant biodiversity. Thus, if REDD+ is well designed and properly implemented, it would have astonishing benefits in all the three areas: forests, biodiversity and climate.

Forests and Carbon Relationship

Carbon exists in the earth's atmosphere primarily as gas in the form of carbon dioxide (CO₂). It constitutes a very small percentage (0.04%) of the atmosphere, yet it plays an important role in supporting life on earth as plants build themselves from it. When plants die, the carbon stored in them is released back into the atmosphere. One way of mitigating or combating global climate change is by protecting and enhancing the carbon storage capacity of the biosphere itself. The success of any mitigation initiatives will depend on the long-term net balance between carbon sink and flux in the biosphere. The biodiversity of ecological communities, including composition and variability of traits of plants and soil organisms, can enhance this balance in several ways. However since the industrial revolution emissions of carbon dioxide from fossil fuels burning and deforestation have been growing leading to addition of carbon dioxide concentration in the atmosphere which disturbs the natural balance and threatens the life of organisms on earth.

In most of the developing countries, forests are an important source of food, fiber, freshwater and construction materials for subsistence as well as cash income for local people and act as 'safety net' in times of hardship (Campbell and Luckert, 2002). Over the world, an estimate about 80% of the population in the developing nations depends on forest non-timber products for primary health care and nutritional needs (Chandrasekharan, 1995). Forests play an important role in both the regional and global carbon cycles as they store large amount of carbon in vegetation and soil for a longer time. Forest has been known to have sequestered about 30% of the world anthropogenic CO₂ emission. Increasing forest area is the effective means to reduce global warming and mitigate elevated level of atmospheric CO₂ (Tolunay, 2011). There are a number of ways by which forest can contribute in mitigating of climate

changes, enhancing the carbon densities, increasing forest areas including reforestation, sustainable utilization and harvesting of forests products and reduction in the forest degradation and deforestation cutting the emission level (IPCC, 2007). On a global scale, the forest carbon sink can contribute to about one third of the total climate change abatement by the year 2050 and the major contribution to this reduction can be accredited to avoided deforestation mainly in the tropical forests region of the world (Tavoni, et. al., 2007). Forest carbon flows comprise a significant part of overall global greenhouse gas emission and sequestering of carbon in the forests vegetation and soil has particular significance in the modern days, since the Kyoto Protocol of the UNFCCC, has mentioned that capturing of carbon in various pools can be regarded as a contribution to reducing green-house gas emissions (IPCC, 2001).

Meghalaya Forests and Climate

The state of Meghalaya was carved out of Assam as an autonomous state in April 1970 and was declared a full-fledged state in January 1972. Meghalaya lies between 24° 58' N to 26° 07'N latitudes and 89° 48'E to 92° 51' E longitudes. It covers an area of 22,429 sq. Km. Meghalaya is inhabited by three main tribal groups, the Khasi (42%), the Jaintia (12%) and the Garo (32%), which together comprise 86% of the state's total population (Tiwari, et al., 2010).

Meghalaya has a total forest cover of 77.06% out of the total land surface. Out of the total forest area, the state forest department control approximately 6% and the rest 94% fall under the category of unclassed forests and managed by the various autonomous district councils, the village durbars and some other traditional institutions (http://www.megforest.gov.in/megfor_gdesc_meg.htm). The ownership rights over land and resources in the state are further protected by the sixth schedule of Indian constitution. Thus, acts and rules framed by the state and national government are not applicable in the state. Based on the management rules, institutional organization intended use, and management practices and ownership, these unclassed forests collectively known as community forests are categorized in to different types of community forests namely, village forest, group of village forest (raid forest), restricted/prohibited forest, clan forest, sacred forests/groves, private forests and agroforestry (Tiwari, et al., 2010). The state also harbors a rich floral diversity, and shows a high degree of endemism (Khan, et al., 1997). The climate in Meghalaya is also very complex and fragile. The various physiological and altitudinal variation gives rise to different types of climatic conditions which ranges from near tropical

to temperate and alpine which is likely to be disturbed greatly by variability in weather conditions. Besides having diverse climatic conditions, the economy of the state also is very closely linked to the many climate sensitive sectors such as agriculture, water, and forestry and these factors make the state very vulnerable to the impact of climate changes (<http://www.moef.nic.in/sites/default/files/sapcc/Meghalaya.pdf>). There is also a need to reduce the level of hill farming (particularly jhum cultivation) but encourage forest based activities like orchards and plantation crops in order that the state better adapt and not contribute to climate change (Maisnam, et al., 2016).

Meghalaya and REDD+ Potential

India has been characterized as a Low Forest Low Deforestation (LFLD) country, although not 100% deforestation free. This can mean that there is a great potential for REDD+ activities in the country and India is partially ready for the implementation of this process (Ravindranath, et. al., 2012). It is a fascinating fact to know that in India, the first community-based REDD+ project was started in Meghalaya. The project known as the Khasi Hill Community REDD+ project brought together ten indigenous Khasi tribal kingdoms that possess legal control over an area of approximately 27000 hectare under the Sixth Schedule of the Indian Constitution (IUFRO, 2014). The project was basically an expansion of Payment of Environmental Services (PES) Initiated by Community Forestry International (CFI) in 2010. Since then the project has shows a successful carbon certification and marketing. The project also has helped in restoring and improving the environmental condition including the degraded forests and capacity building of the project area. (IUFRO, 2014)

The various scenario of the state, forests cover percentage, ownership status of the major portion of the forested areas and utilization of these forests by the tribal people, REDD+ mechanism, one of the climate change mitigation method as well as forest improvement and livelihood supporting program has a great potential in the state of Meghalaya. Besides contributing to climate change globally, REDD+ can also helps in conserving and improving the forests in the state and also the ethnic beauty and biodiversity of the region and supporting the livelihood and capacity building of the indigenous tribal people of the state.

Conclusion

There is an enormous effort put forward in tackling of climate change. The role of forests in climate change mitigation is drawing serious attention in the current days as non-negligible amount of global greenhouse gas emissions are associated with deforestation and forest

degradation. REDD+ can be a very effective tool in saving the forests of the state besides contributing to global carbon reduction. A number of countries like Brazil, Africa, Ecuador, Tanzania, Nepal and many more are showing a positive response and deriving benefits in the REDD+ program. Similarly Meghalaya has a great potential in REDD+ program and can effectively contributing to combating climate change through this mechanism. However, for better and successful implementation of REDD+ program in the state, there is a need of proper understanding of the people about the REDD+ structure and composition and the benefits that it can provide to the environment as a whole.

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