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Cherrapunjee's Forest-Fire: Need Immediate Control Measure

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Introduction

Cherrapunjee is well known to the world as the wettest place on the earth, situated on the southern plate-form of Meghalaya, a hilly state of northeast India, overlooking the plains of Bangladesh. Its geographical location is 24°57'N to 25°27'N latitude and 91°26'E to 91°43'E longitude with 1313.38 meter altitude from mean sea level. Most of the people may think that the highest rainfall area of the world will be covered with thick blankets of green forest, where the sun rays seem to be difficult to penetrate. But in reality, Cherrapunjee is mostly covered by naked hills with *poaceae* vegetation and barren rocky area exposed to the ground. The high rainfall in this area is due to the fact of Southwest monsoon, laden with great amount of moisture from Bay of Bengal. The monsoon blows over Bangladesh and suddenly comes across the cliffs of the tableland with an average elevation of above 1200 meters. This peninsula like land masses are surrounded on either side of a gorges about 600 meters deep and when the monsoon reaches the heads of the gorges, it ascends vertically upwards and causes heavy rainfall (11,763 mm/year).

Since the time immemorial, Cherrapunjee had been subjected to various biotic interferences such as- shifting cultivation, over grazing, unscrupulous cuttings of trees etc. without any compensatory programme. This unique site is susceptible to forest fire during December to March. This wild fire destroys the forests, leads to depletion of soil health, pollute the water bodies and causes imbalance in the whole ecosystem. The annual ground fire along with steepness and rugged terrain lead to accelerated runoff which inhibits top soil restoration in Cherrapunjee. So, the plateau area is mostly covered with rocks exposed barren landscape all on surrounds. Thus, the ultimate consequences are in terms of human and biosphere sufferings, those are likely to be acute and increasing day by day. As the literature in this regards is quite meagre, therefore, taking into account the seriousness of the problem and surge of interest at present days in a sustainable environment, the aim of this paper is to highlight the causes, effect and control measures of forest fire in Cherrapunjee- the wonderland famous as rainiest place on earth.

Cherrapunjee's Forest Fire: The Causes

Forest fire in Cherrapunjee is mainly due to accidental and intentional causes of human being rather than natural causes. Most of the local people of this area have the habit of smoking to get-rid-of cool climate of Cherrapunjee. The travelers, picnickers, villagers or even forest labourers sometime carelessly throw unextinguished cigarette, bidi, or match stick to the dried grasses, and when strong winds (locally called 'Pythaw') pick up these small sparks, result into forest fire specially in the month of November to March. It is also noticed that the local people rearing cattle used to set fire to obtain a fresh flush of edible grasses; which is one of the main causes of occurrence of annual fire in Cherrapunjee. Further, the age-old slash and burn agriculture i.e. *Jhum* cultivation practices sometimes cause the spread of fire to the adjoining area. In addition to these, there are many other experiences of forest fire due to unextinguished campfire, negligence on control-burning operations and fire set by tribals to search for wild animals and their nests. As Cherrapunjee is at a high elevation, sometime lightening and rolling stones through the slopes of mountains also caused fire to the combustible dried grass materials present on the forest floor.

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Effect of Forest Fire in Cherrapunjee

Forest fire controlled or uncontrolled, have profound impact on the physical environment like climate change, land use, land cover, bio-diversity and forest-ecosystem (Srivastava and Singh, 2003). In Meghalaya, out of total forest area of 15,657 sq. km., almost 6560.30 sq. km. forest area is affected by fire (Roy, 2000). But particularly when Cherrapunjee's valuable forest resources is concerned, there is no comprehensive data to indicate the loss to forest in terms of area burned, values, volume and regeneration damaged by fire.

Whatever may be, it is evident that the annual ground fire in Cherrapunjee causes immense damage to the plantations and natural regenerations. The mechanical injury to the plantation and forest trees may result in declining above ground net primary productivity. Forest fire acts as a great hindrance to the conservation of soil and water. As a result of repeated forest fire in Cherrapunjee, far reaching effects on soil are – accelerated erosion and heavy run-off due to exposure of surface soil through destruction of the vegetation cover. In Cherrapunjee due to high intensity precipitation accompanied with undulating topography, run-off velocity easily exceeds the critical limit of erosion, washing away the soil along with ash and sediments. That is why the organic matter, nitrogen and phosphorus content in soil of Cherrapunjee are extremely low. It has been estimated from preliminary observation that about 40 tons/ha/year of top soil is lost from the fire prone areas of Cherrapunjee (Borthakur, 1995), compared to that of 0.04 to 0.05 tons/ha/year in forest ecosystem (Anonymous, 1995), in general. Again, unchecked erosion process fueled by forest fire in Cherrapunjee leads to formation of ravines, and causes landslides. This sliding down of large chunk of soil often creates the problems of road blockage in Cherrapunjee.

Thus, the “forest fire”- burning with natural fuel, is wild in nature and results in the loss of sediments along the nutrients and death of microorganisms in the soil. This might be the main causes of availability of grasses, ferns and compositae forms of vegetation in Cherrapunjee. One may observe the pines and some broadleaved species regenerated naturally with stunted growth habit, which is because of the fire hazards that wiped out their tender growth and new sprouts, annually.

Besides these effects on edaphic factors, forest fire in Cherrapunjee is also responsible for environmental degradation (Biswas, 1990). Burning causes the release of heavy amount of green-house gases which can lead to the ozone's depletion. Forest fire can change the microclimate of any region as the dense smoke of the fires affect the visibility up to 4,000 meter (Srivastava and Singh, 2003). According to data collected by NASA, smoke releases out from forest fire not only lead to environmental pollution but also reduces rainfall. This may be a reason that Cherrapunjee faces dry spell for some days even during the monsoon months which was unusual in the past. Thus, Mawsynram located close to Sohra is receiving much more rainfall than Cherrapunjee (Philemon, 1995).

Forest fires also affect on macro fauna, where many animals die and some are forced to shift to a suitable habitat. Here, one may surprise to hear that birds are rare at Cherrapunjee. They often act as an indicator species and very sensitive to any change in climate. Forest fire is responsible for burning of their nests and killing the young ones. In this way, many other animals or tree species may also become extinct from Cherrapunjee, which are indigenous and rare in nature.

Villagers in Cherrapunjee also suffer from this fire as the agricultural crops are lost and even sometimes their habitat area is damaged due to fire. Forest fire may affect the frequency and severity of pest and disease outbreaks through climate change in Cherrapunjee, in coming future. Sometimes the annual ‘ground-fire’ in Cherrapunjee may spread as ‘crown-fire’ leading to unpredictable damages and degradation of ‘sacred-forest’ – the mystical land of mythology for the local people, that is full of endangered species of both flora and fauna. This crown fire may spread destroying the trees, beasts and humans; and can affect the tourism industry with a loss worth crores of rupees.

Suggestive Control Measures

The problem of ecosystem damage is international, and probably no country in the world can remain unaffected. On the other hand, Cherrapunjee's forest fire is harmful not only from ecological point of view but also from economical aspects of the people too. It must be understood that forest fire can cause massive losses of valuable gene pool; and it takes several years to recover environmental

losses. Nature takes about 500 years to make 2.5 cm soils (Prasad, 1995). Persistent and continuous occurrences of forest fire in Cherrapunjee may have pronounced and prolong ill effect on ecosystem.

In Cherrapunjee, about 70% of the total cultivation area is under Jhum cycle, which should be stopped immediately with some alternatives. Here programme should be implemented to settle the *Jhumias* through some special composite activity. In Bordumsa circle (Changlung district) of Arunachal Pradesh about 80 Noctee families were settled through Noctee Settlement Project. Under this project the *Jhumias* were provided land for cultivation along with other initial support like cash, ration etc. by the Government. In Cherrapunjee also, local people should be advised to adopt farming system, which are soil restorative rather than soil depletive, fertility mining or soil-degrading. The experiences of the Agriculture and Forest Department should be shared with local peoples for eco-restoration of the world's wonderful site.

The pre-requisite for any eco-restoration work is mass movement of people's participation. In Cherrapunjee, women generally own the property, so women participation is very important. The basic education on environmental issues should be considered as the important activity to motivate the people. Special lectures on environment awareness should be introduced in school and colleges; and essay writing, poster designing etc. on this subject can be arranged among the students. Public awareness meetings and demonstrations regarding the bad effect of forest fire should get the priorities. Again the local publications, radio-talks, television, poster etc. audio-visual aids can also play vital role in this regards. The Dangs forest of Surat Division in Gujarat is being successfully protected from fire, as the local people are taught to consider fire as the forester's deadly enemy, unacceptable in the forest in any shape or form (Hodgson, 2006).

There are about 4 kilometers square area of reserve forest and 6 kilometer square area as sacred grove in Cherrapunjee, protected by village council and local *khasis* respectively (Tripathi *et al.*, 1995). Forest Departments should go for providing a green umbrella by improved afforestation technologies in the degraded areas. Plantation programme should be carried out with improved technologies where seedlings should be planted in deep pits provided with half-moon shaped stone bunding and mulching for water harvesting as well as for minimizing the losses of nutrients. A perusal of data of a plantation programme carried out in a fire affected barren site of Cherrapunjee with *Alnus nepalensis* and *Exbuclandia populania* revealed that seedlings planted in the pit size of 30cm x 30 cm x 60cm with mulching and half moon shaped stone bunding for water harvesting and fertilization (with 50g urea + 50g SSP + 25g MOP) showed better growth performance as compared to seedlings of the pit size of 30cm x 30 cm x 30cm with no mulching, stone bunding and fertilizer treatment (Goala *et al.*, 2006). A further observation on the mortality of the seedlings recorded a 90.80 and 75.18 survival percentage for *A. nepalensis* and *E. populania*, respectively. Preparation of fire line (of about 5 meter width) around the plantation site and employment of fire-watcher at least during the drier months of the year might prove very effective for establishment of a successful plantation in Cherrapunjee. Corrie (1995) also suggested some other early successional indigenous species viz., *Cryptomaria japonicum*, *Pinus khasiana*, *P. resiya*, *Prunus nepalensis*, *P. cerasoides*, *Grevelia robusta*, *Cupressus* spp. and *Jacoranda ovulifolia*, which have the capacity to regenerate even under unfavourable water and nutrient status and are suitable for degraded site of Cherrapunjee. The Joint Forest Management strategies i.e. tree plantation and protection of forest with the help of local people living nearby the forest, will be very fruitful in this regard.

It is high time for Government and Forest Department of Meghalaya to take all necessary steps to prevent the forest fire in Cherrapunjee. It is very much essential to make an immediate ban on all degrading processes operating in the area. Laws of no entry in the forest for grass cutting, recreation or collection of non-wood forest produce (such as- honey) should be imposed during the higher fire risk days.

Different Institutions, Non Government Organizations and Research Institutions should take-up feasible schemes to restore this hot spot of the world. Survey should be carried out for edaphic factors, land use, rainfall and run-off under various conditions to take up the necessary measures for eco-restoration work in Cherrapunjee.

Conclusion

Restoration of Cherrapunjee from forest fire is a horrendous task. It should be noted that more than 90% of forest fire in Cherrapunjee is due to human's carelessness, negligence and ignorance. Therefore, forest fire in Cherrapunjee can be controlled when the good will of the local people is achieved. Scientific based resource management from grass root level in an organized manner will tame the forest fire in Cherrapunjee.

It should be considered as "key trust" activity for creating the awareness among the local people against the forest fire for achieving the full support at an earliest possible. It is the pinnacle time for the local people and Forest Department of Meghalaya to work hand in glove, otherwise the world's wonderland – Cherrapunjee will go out of our hand as "Wet-Desert".

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SUMMARY

Forest Fire as anti environmental human activity is becoming a great threat for eco restoration of Cherrapunjee – the site famous as wettest place on earth. Human's carelessness, negligence and ignorance are the main causes of annual ground fire in Cherrapunjee resulting in pronounced and prolonged ill effect on climate, land use, land cover, biodiversity and forest ecosystem. There is an urgent need of fire management practices based on scientific technology, where emphases should be given on people's participation through Joint Forest Management Programme. Otherwise the forest fire may wipe out the varying genetic materials harboured by the abode of clouds- Cherrapunjee, and leaving it as Wet-Desert.

Key words: Wild ground fire, Ill effects, Management, Cherrapunjee.

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