

Ecological Status and Attribute of Dihingmukh Reserved Forest of Dibrugarh District

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ABSTRACT

The paper attempt to describe the 'Ecological status and attribute of Dihingmukh reserved forest of Dibrugarh District'. The Dihingmukh reserved forest is rich diverse biodiversity with large number of plants and animals of high environmental value for whole ecosystem of the area. With growing population these forest areas are degraded to great extend for cultivation. Thus the paper mainly attempt to evaluate ecological status and to find out the problem faced by plants and animals. It also determines socio-economic status of the forest village people as well as suggestive measure and strategies to maintain the ecological status of Dihingmukh Reserved Forest.

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Human life is being closely dependent on the natural resource base for its survival; conservation and exploration of natural resources have been age-old phenomena. At present, both burning and cutting have assumed such large proportions that the earth's forest cover is seriously endangered. Biodiversity is the variety of life and its processes. It includes the variety of living organisms, the genetic differences among them, the communities and ecosystems in which they occur, and the ecological and evolutionary processes that keep them functioning, yet ever changing and adapting. The largest scale of ecological organization is the biosphere: the total sum of ecosystems on the planet. Ecological relationships regulate the flux of energy, nutrients, and climate all the way up to the planetary scale. The Dihingmukh reserve forest rich diverse biodiversity with large number of plants and animal of high environmental value for whole ecosystem of the area.

The Dihingmukh reserve forest bordered by the Brahmaputra river in the west, the Burhi Dihing river in the south, and the Sessa river in the east. The highly meandered course of the Burhi Dihing here has left cut off as many as 39 wetlands in the form of Ox-bow lakes and swamps. The high alluvial content as well as lateritic make the ground favourable for the growth of many plants and animal. With the growing population these forest areas are degraded to great extent for cultivation and other purposes for which their causes imbalance in the ecosystem. Most of the plants and animals suffer in the whole process and the man himself also suffered a lot from the flood erosion as well as animals' conflicts on them. The Dihingmukh reserve forest which was enriched with diverse plants and animals' species now lost its biodiversity.

To determine geographical status of the forest the spatial distribution of the plants and animal as well as socio-economic status of the forest village people is very much essential. In this versatile complex of problems, study of forest assess all factors directly or indirectly pertaining to its field of activities before it can initiate management directed towards future integration of production, recreation, the physical and spiritual welfare of the people and to be understood and supported by everyone.

OBJECTIVES

In the study, an attempt has been made to understand the various plants and animals distribution in the areas and their relation with the ecosystem.

- i. In the study, it has been proposed: To evaluate ecological status of the reserve forest
- ii. To find out the problems faced by plants and animal.
- iii. To suggest measures and strategies to maintain the ecological status of DihingMukh Reserved forest

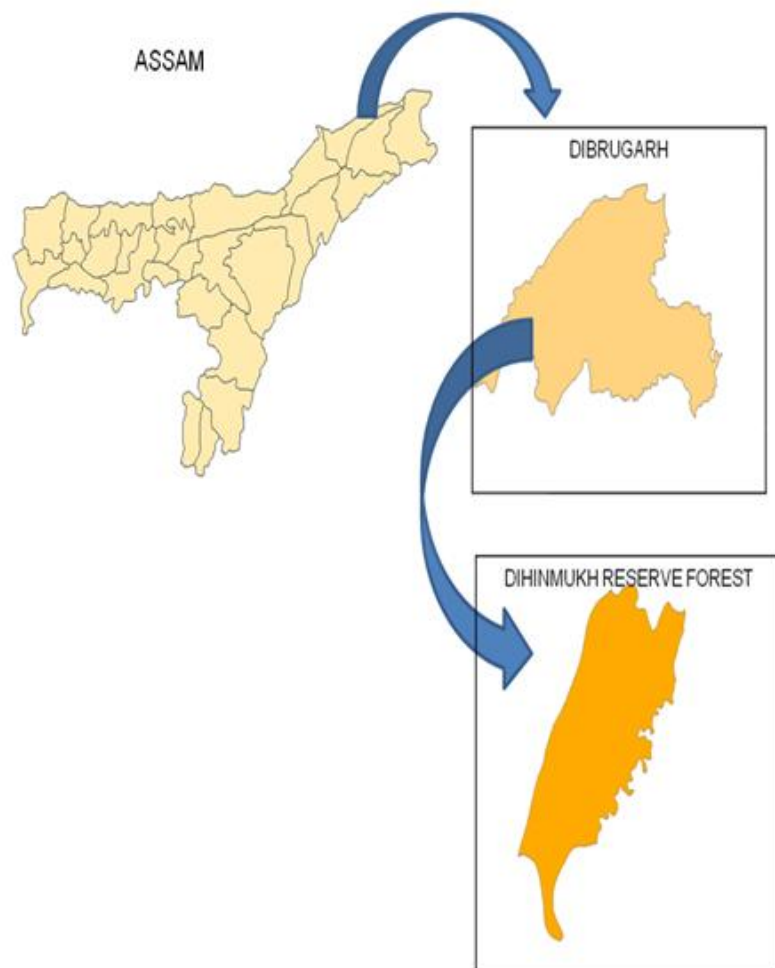
AREA OF STUDY

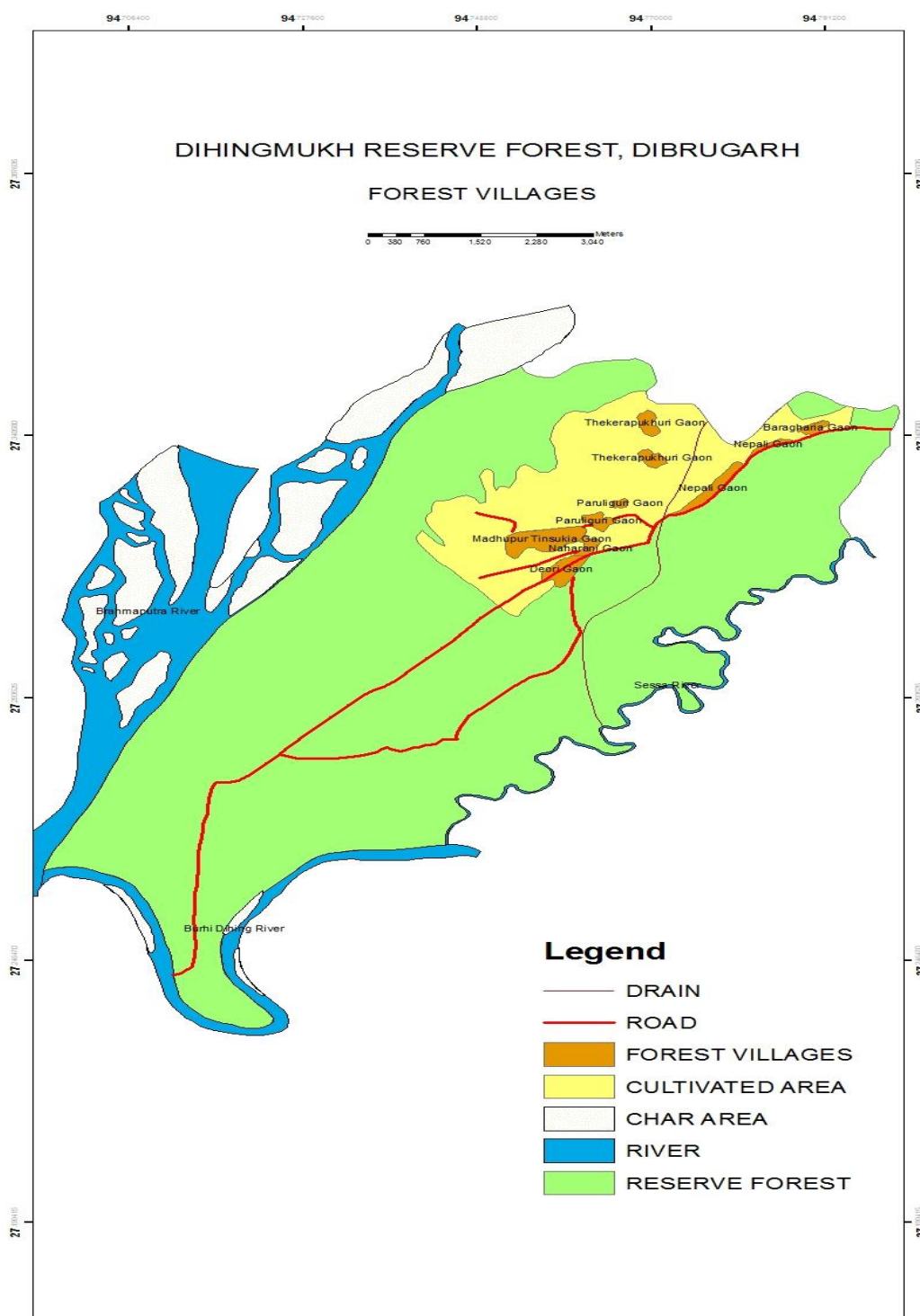
The dihingmukh reserve forest is located to the south-western part of Dibrugarh district, Assam. It is bounded by three rivers, Brahmaputra River in the west, Burhi-Dihing River in the south and Sessa River in the east. It is known as Dihingmukh reserve forest because of its location at the mouth of the river Burhi-Dihing. It covers an area of 5879.040 hectare. The reserve forest is divided into two forest beat- Medla Forest Beat and

Khowang Forest Beat with 2939.52 hectare in both beat. A major part of it is and extensive plain formed by the Brahmaputra and its major south bank tributary-the Buri Dihing. The Dihing much reserfed forest covers an area of 5879,040 hectare of which 326,348 hectar is allotted by the forest department to the forest villages of the reserved forest. There are seven forest villages

1. Barogharia Miri forest village
2. Nepali forest village
3. Paraliguri forest village
4. Naharani forest village
5. Thekera Pukhuri Miri forest village
6. Madhuri Deori forest village
7. Tinsukia Forest village

The Dihingmukh Reserved forest as bounded by river on three sides for which there occur flood during the monsoon season. But existence of different plants on the area makes a less affected the land and soil. The bamboo and tall grasses in the riverside areas provide obstruction during flood time. In the forest there are many wild edible plants which are collected by the people for





consumption. From the small herb plants to large tree fruits from forest are consumed by the local people. Livestock animals including cows, pigs and goats feed primarily or entirely on the forest plants. The trees of the reserved forest like hollong, nahar, sal, semul, arjun, ajar etc., are found. Here mostly the wild elephant and wild buffaloes are found in large numbers. There are about 80 – 90 elephants which come from Sibsagar district from Pani Dihing Bird Sanctuary in search of food in the forest. According to the forest beat officer most of the animals are not permanent residents of the forest, they immigrate here during the fruits and crops growing season and move away during the summer season due to high affluence of flood. The small animal

like fox, squirrel, wild pig etc are also found here. According to forest beat officer there is also presence of tiger which are seen in reverine areas.

ECOLOGICAL ATTRIBUTE OF DIHINGMUKH RESERVE FOREST

The Dihingmukh Reserve Forest offers a wide range of habitats sustaining diverse flora and fauna. The heavy rainfall and favourable climate in this rainforest provided habitat of large and important animals like wild pig, wild buffaloes, elephant, monkey, large varieties birds etc.

The ecological attribute of Dihingmukh Reserve Forest comprises of wetlands i.e., swamps and marshes, dense mixed jungle with tall, medium, and short trees, varieties of wild plants animals of different varieties, tall grasses and large number of wild edible foods which balance the ecosystem of the region. The surrounding three rivers the Brahmaputra, the Burhi-dihing, and the sessa itself provide a favourable ecology.

a) Wetlands: The highly meandered course of the Burhi Dihing here has left cut off as many as five wetland big and small. The area is endowed with extensive water resources. The larger ones are popularly known as Beel, while the marshes and swamps are generally known as jalah, doloni, pitoni, doba etc. The wetlands here are of two categories: the lake like ones, i.e. beel with clear wide-spread water area and the others i.e. swamps and marshes covered by weeds, grasses etc. All these water resources provided good attributes for the wildlife features.

b) Dense mixed jungle: The dense mixed jungle with tall, medium and short trees like Nahar, Hollong, Sal, Otenga, Banana, Jackfruit trees, canes together constitutes a good ecological place for the survival of small to large animals.

c) Wild plants and animals: The extensive of many wild plants and animals in the reserve forest maintain a good ecological system. There are plant species which not only provide favourable environmental condition but also provide shelters and foods for the wild animals. It consists of many wild plants which are rare and important for the area of which some of them are used as medicines.

d) Wild edible plants: There are presences of many edible plants in the forest which are ecological important. Many of the plants like Canes, Otenga, Banana, etc. are taken as food by many wild animals making as one of the most important ecological attributes for wild animals in the forest.

Including these, climate is also one of the important ecological factors which provide favourable condition for the animals. The heavy rainfall in summer and cold in winter makes the environment very pleasant for the survival of animals.

HABITAT AND ECOSYSTEM

Habitat is the specific place occupied by an organism, which has a particular combination of a biotic factor. According to Tansley 1935, define ecosystem 'as the system resulting from the integration all the living and non-living factors of the environment'. An organism functions according to the providing habitat. The habitat may be of any kind, it may be a small habitat from niche to the large ecosystem. The variety of habitat, by and large, determines the diversity of wildlife. For example, predator need keen eyesight and impressive turn of speed in order to catch their prey. No wonder, they find grassy plains with little vegetation cover most comfortable to live. Similarly, those animals, which are exposed to hunting by larger animals, need to be proficient at camouflaging and these look for such a habitat which hides them. Each habitat has its own demands on its residents. The Dihingmukh Reserve Forest consists of mainly habitat like Water, trees, grassland etc.

a) Water as a habitat: As the reserve forest is surrounded on three sides by water bodies, it is rich in water bodies from the fresh water wetlands to perennial water bodies of varying shape, size and depth called locally as beels, hoars, jalah, doloni etc. The aquatic animals of the forest belong to diverse habits and have distinctive characteristic. In these habitat many animals like Micro-fauna, aquatic insects, Arthropods, fresh water Prawn, Fresh water Reptiles etc are found. The water habitat provides habitat for this animals as well as habitat for other animals in terms of food.

b) Trees as a habitat: The Dihingmukh rainforest is endowed with large varieties of trees. It comprises of dense mixed forest of Nahar, Semul, Hollong, Sal of hardwood as well as edible fruits growing trees of *Otenga*(elephant ball), Mango, Jalfai, Jack fruit, Banana etc. Due to the presence of these edible fruits monkey, squirrel, elephant etc. are seen to shelter in these habitat. The shelter of the elephant is the groves of trees, and the forest is endowed with dense forest for which it find comfortable to find their shelter, food and hide from the enemy. The ecologically presence of the trees provide habitat for many animals in the Dihingmukh Reserve Forest and function together in this ecosystem.

c) Grassland: Grassland provided habitat for many animals like Wild Buffaloes, Wild Pig, Mongoose, Fox, and Rabbit etc. The swamps flood plain with wet muddy land constitutes a good habitat for the existence or survival

of the Wild Buffaloes. The take grass as a food which presence in the existing habitat. The grassland not only provided habitat for the animals but also for the reptiles, insects, micro-organism and ground of prey for other large animals.

The Dihingmukh Reserve Forest not only provide habitat for some particular animals but also it provide a habitat for large diverse groups of animals from small reptiles, birds to big animals which altogether constitute a large Ecosystem region as Rainforest Ecosystem.

FOREST DEGRADATION

In the Dihingmukh Reserve Forest degradation of forest found to be increasing with increasing years due to the involvement of man in destruction of forests from the seven villages as allotted land by the forest department. On analysis it has been found that the total forest cover in 2006 was 47128656 sq.km which decreases with 39681622sq.km in 2009 and present in 2012 it has been found that the forest cover is 23522533sq.km. There has been rapid change in the forest cover and land use in the Dihingmukh reserve forest. In the year 2008 as shown in fig. Degradation of forest is in the northern part where there is the settlement of the people. In fig forest cover in 2009 was lessen as in the southern part there were only presence of grassland and some small and large wetland. This is mainly due to the effect of the flood every year during the rainy season. Degradation of the reserve forest is much in the both the northern and southern part. In the northern part the degradation is taken place due to the extensive used of land by the village people for cultivation and settlement purpose. Only in the middle and south-eastern in the riverside track of the Sessa River forest cover is present.

CAUSES OF DEGRADATION

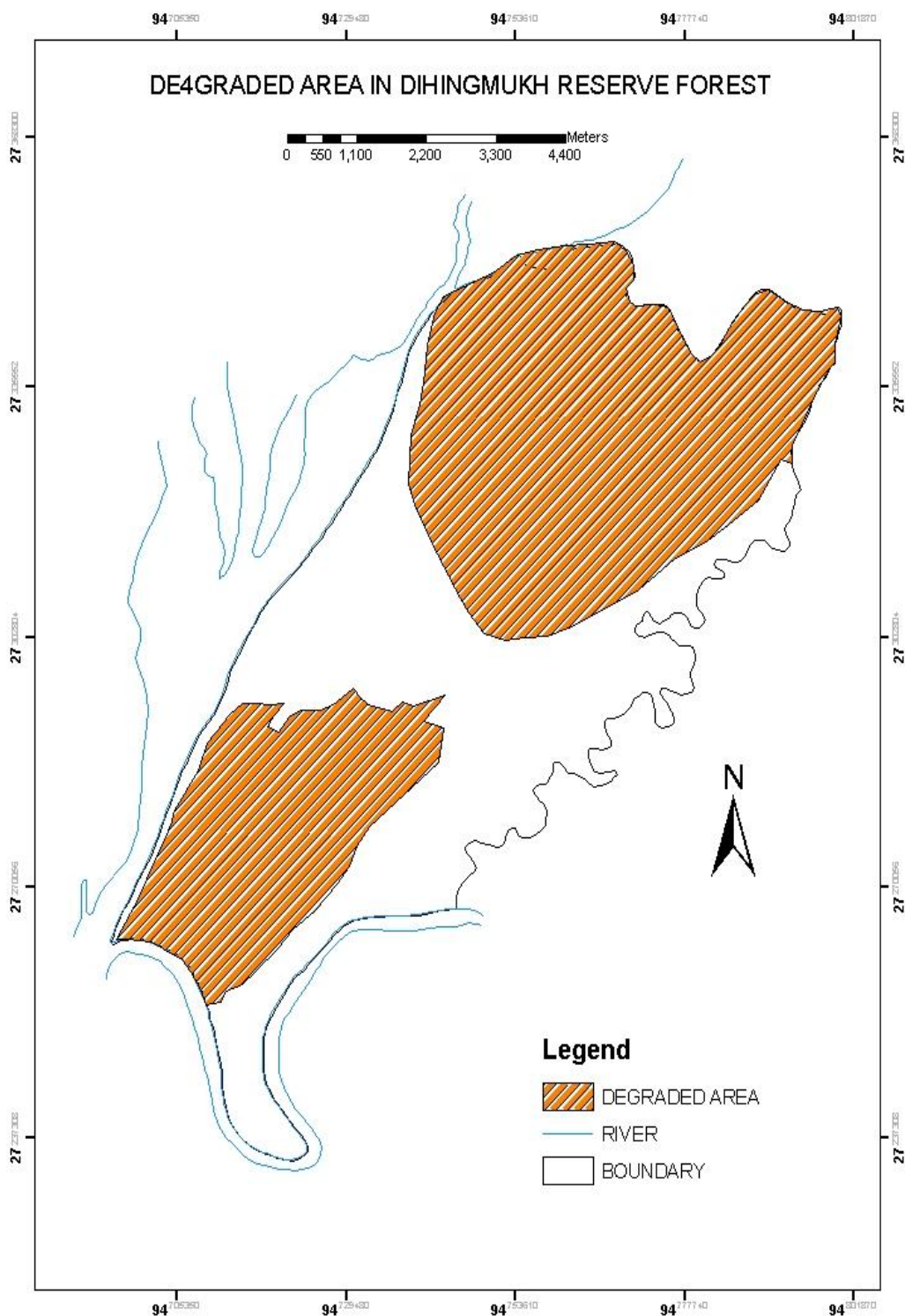
The main causes of forest degradation in the Dihingmukh Reserve Forest are ----

- Conversion of forest land into agricultural land
- Transformation of forest into pastures,
- Overgrazing,
- Forest fires,
- Lumbering,
- Biological factors,
- Physical factors, etc.

(A) Land use Changes: Increasing population growth at fast rate has put enormous pressure on the area because it becomes necessary to clear the virgin forest covers and convert them into agricultural land so that agricultural production may increased and sufficient food may be provided for the human consumption. Out of the 5879.040 hectare of the Reserve forest, 326.348 hectare is used by human of whom 57.19 hectare is used for homestead land and 266.42 hectare is used for cultivation.

(B) Transformation of forests into pastures: Transformation of forest into pastures has been responsible for rapid rate of loss of virgin forest in the areas. Most of the cattle of village people like the cow, goat, and buffaloes are reared in the nearby forest areas. The food for these cattle is gathered from the forests that are available.

(C) Overgrazing: Overgrazing is another factor of forest degradation. With the increase in human population and needs, there has also been increase in the number of animals for domestic use like milk, meat, etc. As the reserve forest has seven forest villages with the 266.42 hectare of cultivable land, a large herd of animals are present for the agriculture in each village which need large vegetation cover area for grazing. So, a wide area of the forest is degraded due to overgrazing by the large herd of cattle.



(D) **Forest fires:** Forest fires whether natural or man-made are effective destroyers of forest covers. Atmospheric lightning is the major source of natural forest fires. The village man causes forest fires through his intentional/ advertent and unintentional actions. Deliberate burning of vegetation to get rich and fresh grasses next season leads to several types of changes in the surface materials. Besides destroying vegetations, forest fires harden the ground surface which decreases the prosperity of the soils and consequently there is little

infiltration of rainwater. Thus most of the rainwater becomes effective surface runoff which accelerates the rate of soil erosion. Secondly the frequent forest fires destroy the leaf litters on the ground and thus the soil nutrients and humus contents are markedly reduced and sometimes are completely destroyed. Besides forest fires kill all of the micro-organisms living in the leaf litters mainly decomposers and in the soils and plant roots. Thus forest fires not only destroy natural vegetation and retard and taboo regeneration of trees but also cause tremendous damage to the biological communities and thus cause ecological imbalance. After the cultivation, people of the Dihingmukh Reserve Forest used to burn the forest for clearance of next cultivation.

(E) **Lumbering:** Lumbering for domestic and commercial purposes is the real cause of large scale destruction of forest covers in the Dihingmukh Reserve Forest. According to the survey, it has been found that most of the people of the reserve forest used wood from the forest for cooking, house building, boat building etc. Ever-increasing demand of timber by rapidly increasing population has done great damage to natural forests covers of the reserve forest. Collection of fodder and firewood by the village population from the depleted and poor forest covers has further degenerated already improvised forests covers.

(F) **Biological factor:** Biological factor also involves in destroying the natural vegetation. Conversion of forest areas into agricultural farms has resulted into tremendous pressure of animals on existing forests. Further use of chemical fertilizers, pesticides and herbicides in the agricultural field nearer to the forests has driven out micro-organisms such as insects and termites towards the adjoining forests where these cause serious damages to the plants.

(G) **Physical factor:** Forest are also degraded by the physical factors as through accelerated rate of soil erosion by rill and gully erosion consequent upon rapid rate of deforestation. Large scale deforestation in Dihingmukh Reserved forest has resulted into the decrease of infiltration of rainwater and therefore marked reduction in the recharge of ground water resource. Increase in the frequency and magnitude of floods, marked decrease in the biological diversity of the natural ecosystem have caused overall disequilibrium in the natural environment and ecological imbalance. In the Dihingmukh Reserved forest most of the plant and animals species are loss due to the upcoming of heavy flood every year during monsoon season.

SUGGESTION

Some of the suggestions for better forest conservation are given below:

- **Expand Reserve Forest areas:** As many areas should be protected as soon as possible. If protected areas can be developed in such a manner to generate income for local communities, an increasing number of areas should theoretically create more economic benefits for a greater share of the population.
- **Increase surveillance of and patrols in protected areas:** This can be done at a reduced cost if local communities benefit from the success of the park. If locals have a vested interest compensated via entrance fees, hired as guides, make handicrafts to sell to visitor, and learn to they will want to watch the reserve forest so that the source of their income is not diminished. Community surveillance is the most effective way to patrol a protected area, though it will probably be necessary to have forest staff conduct patrols as well. Guides should be trained as well to keep watch for activities that are damaging to the ecosystem and report suspicious activities at park headquarters.
- **Build research facilities for training local scientists and guides:** The forest reserve needs to build its intellectual capital to grow its economy and make the best use of the resources. There need to be further studies on endemic species (many just have a name and a location and new species are being discovered every year) for both pure-research reasons and potential commercial applications. Improved crop yields and reduced erosion could also be possible with future research.
- **Establish programs that promote sustainable use:** Programs that promote sustainable use are key to elevating the standard of living for people living around forest areas. Not all members of a community will see the direct benefits from employment in the service or production sector, and many people will still rely on traditional use of the natural resources around them. These resources must be used in a more effective manner to maximize productivity and minimize the impact on the environment.
- **Compensate displaced people:** As more protected areas of the reserve forest are set aside, it is inevitable that some people may be asked to move. It is important that these people are compensated for abandoning their existing livelihood and homes. While direct cash payouts are an option, a better strategy is providing these displaced people with long-term income possibilities through training in better agricultural techniques or alternative crops.
- **Promote ecotourism:** Ecotourism is perhaps the best hope for the local people of the reserve forest. Planners should seek to minimize the environmental impact and maximize the benefits for local communities.

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