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forest for livelihood. They cutting the trees for making house, selling valuable trees for money, for fire woods etc. day by day the forest reducing and it leads to global warming and directly affect on environment. For sustainability of north-east region we should prevent deforestation by Afforestation.

KEYWORDS: Deforestation, Sustainability, North-East, Preventing, Afforestation.

INTRODUCTION:-

Sustainable development is an ideology which maintains an appropriate balance between economic development, social development and environmental protection. It is the process in which the economic and social welfare of the people can be maximized with the minimum damaged to ecology and environment. Sustainable development largely depends on renewable natural resources of air water, soil sunlight and communities of plant and animals. Thus conservation

of environment and sustainable development are closely interlinked to each other, that one cannot be achieve at the expense of the other. But about half of the word's original forests have been damage due to the causes of industrialization, increase of population and other several factors. Before 1960, forests accounted for almost 35% of the earth's land area. This has reduced by almost 15% in the lost 50 years. An estimated 18 million areas (7.3 million hectors) of forests are lost each year, according to the United Nation's Food and Agriculture Organization (FAO). Destruction of forests has resulted into loss of biodiversity, degradation of watersheds, desertification, global climatic change and also impact on economic aspects of human life.

Today we face a challenge keeping a balance between development and maintenance of natural resources such as forests, ecosystem etc.

PROBLEM OF THE STUDY:

India's North-Eastern region consists eight states — Arunachal Pradesh, Assam, Monipur, Meghalaya, Mizoram, Nagaland, Tripura, Sikkim occupying — 2,62,179 square k.m. Most account and discussion about the North-East India point out its diversity in people, plants and animals life. The region is rich in natural resources specially water and forests. The forests of North-East India are rich in biodiversity, contains more than one third of the country's total biodiversity. Forests of this region are unique both in terms of their structure

“PREVENTING DEFORESTATION: A PANACEA TO SUSTAINABILITY OF NORTH-EAST INDIA”

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ABSTRACT:

Destruction of forests has resulted into loss of biodiversity, degradation of watersheds, desertification, global climatic change and also impact on economic aspects of human life. Today we face a challenge keeping a balance between development and maintenance of natural resources such as forests, ecosystem etc. The North-East India point out its diversity in people, plants and animals life. The region is rich in natural resources specially water and forests. The forests of North-East India are rich in biodiversity, contains more than one third of the country's total biodiversity. The people of this region specially depend upon the natural resources for their survival. They directly depend upon the

and species composition. Major forest type of North East India are Alpine temperate Subtropical pine, Subtropical Broad leaved, Tropical evergreen, Tropical semi evergreen (Forest Sector review, 2006). The forests of North-East constituted the key livelihood environment for many of the region's inhabitant. The forests of this region play a crucial role in balancing the ecology and also provide to the tribal communities food and livelihood security. But over the last few decades's rates of deforestation have been increased due to land clearing migrant and local people and heavy timber demand, industrialization, urbanization and other several factors which stand a threat to environment and sustainability of the tribes of the region. In this situation there is a need to study about the problem of 'deforestation'. Why it happen? How it effect on sustainability of the tribes of the region? How it should remove or what are the necessities of preventing deforestation?

OBJECTIVES OF THE STUDY:

The main objectives of the study are-

- 1) Study about the causes of deforestation in North-East India and how it impact on sustainability of the tribal people and environment.
- 2) To study about the necessity of preventing deforestation and how it should be removed?

METHODOLOGY:

The study is based on secondary data i.e. books, journals, newspaper etc. and also depend on observation.

RATE AND CAUSES OF DEFORESTATION IN NORTH EAST INDIA:

Deforestation means destruction of forests. It has been described as the cutting down the trees without planting other in their place. Deforestation is the conversion of forests to an alternative permanent non-forested land use such as agriculture, grazing or urban development (Van Kooten and Bulte, 2000). Deforestation has serious effects on human life and environment. The north Eastern states of India are facing the global deforestation challenges. North East India is rich is natural resources such as water, forests etc. Forest cover of North Eastern States of India is shown on the following table —

Table — 1.1
Forest cover 2011 (Area in Sq. K.m.)

States	Geographical Area	Forest Cover	% Forest Cover
Arunachal Pradesh	83743	67410	80.5
Assam	78438	27673	35.3
Manipur	22327	17090	76.5
Meghalaya	22429	17275	77
Mizoram	21081	19117	90.7
Nagaland	16579	13318	80.3
Sikkim	7096	3359	47.3
Tripura	10486	7977	76.1
NER	262179	1733219	66.1
India	3287263	692027	21.1

Source — Forest Survey in India

Above table shows that region has a cover of forests more than 66.1% against the natural average 21.11 percent. Forest cover highest in Mizoram and low in Assam. The North Eastern region is rich in forest resource. Still The Forest Survey of the last few decades shows the decrease of forests in this region. According to the last Forest Survey in India (2013), during the last two years 627 Sq. K m. forests were decreased in North Eastern State (Amar Asom). In 2011 report 549 Sq. K.m. were lost between the years 2009 to 2011. In North East India 58.17 percent of the total forest cover is dense

forests and 41.83% are open forests: There is a substantial decreased in area of open forests in most of the states of the region. The total decrease was about 8630 hector during 1991-99 in these states.(Forest sector, Review, 2006). Decline of the forest cover in the region is due to various factors. These are-

SHIFTING CULTIVATION:

Shifting cultivation (locally called as Jhum) is the main form of agriculture in the hills of North East India. It used to be practice in divers socio-economic set up. It is the system of farming in which field were prepared by cutting down the natural vegetation, letting it dry and burning it off. One of the most negative points of shifting cultivation is destruction of forests or deforestation.

Table-1.2
Area under shifting cultivation in NE India as estimated by different agencies:

Agency	Year	Area (Million Hector)
NEC	1975	2.80
Task Force of Shifting Cultivation Ministry of Agriculture	1983	3.81
Forest Survey India	1999	1.73 .

Source — Tripathi & Barik

Fuel Wood:

People especially those who live in rural areas, where electricity and gas are unavailable, resort to use of firewood as a source of heat. In North East India above 85% people live in rural areas as because of which fuel wood is a factor of deforestation in this region.

Timber:

Timber and plywood industries are also responsible for destruction of forests. Forest survey of India 1987 reported that timber and plywood industries annual demand was more than 27 million cubic meters and permissible cut of timber from forests was only 12 million cubic meters.

Forest fires and diseases:

Fires are a major tool used in cleaning the forest for shifting and permanent agriculture. According to forest survey of India (1996) on average 63% forest vegetation is effected by fire. Annually 0.5 million hectares forests destroyed in India. North East India also affected by this cause. Besides this many diseases caused by parasitic rusts, virus etc. are also affect on deforestation.

Industrialization and Urbanization:

Industrialization and urbanization are also affecting on deforestation in North East India. Tropical forests are a major target of infrastructure development for oil exploitation, Hydropower darn construction (Kaimowitz and Angelsen, 1998). The construction of roads railways, bridges and airport opens up the land to development and brings increasing numbers of people to the forest frontier. Hydropower projects of North East India impact on deforestation. In North East India planned 168 small and big hydropower projects. Some were already completed (Dutta Akil Rajan) : Till October 2010 the government of Arunachal Pradesh has already allotted 132 projects to companies in the private and public sectors (Das & Vagholikars). Lower Subansiri hydro electronic project of Assam-Arunachal border is an example of deforestation in these areas.

Increase of Population:

Increase of population is another cause of deforestation in North Fast India. The population census reports of North -East India shows the increase or population in **every** ten years. Increase of population need land for reside and agriculture. So they used the habit of deforestation.

Land Slide:

Land slide is a serious problem in the hill areas of North East India. Destruction of hills for construction of building, roads and railways caused indirectly in the land slide of North-east India which impact on deforestation.

Impact of deforestation on Sustainability of Tribes of NE. India:

Tribal population of North-east India belongs to a large number of tribes and Communities. It may be mentioned that about 44 percent schedule—tribes of India live in the Northeast region of the country, which in terms of percentage comes to 25.18 of the total population of North-east India. Since the age tribal communities live in the lap of the nature. Around 90% of tribe's populations in India are depending on land directly or indirectly for their survival. Their economy was primarily agro based. Land is the only tangible asset for them. Apart from the land forest is the second source of their livelihood. They used to collect various minor forest products from forest for their survival. Natural environment surrounding the people provides several goods, services and amenities to them, but using the environmental resources for one purpose always reduces its ability to supply them with other services.

The concept of sustainable development has acquired the central theme of any tribal development. The concept of sustainable development emerged in the 1980s. The best explanation to sustainable development was given by the World Commission for Environment and Development (the Brundtland Commission) in its 1987 report, 'Our common future' as the ability to meet the needs of the present without compromising the ability of the future generation to meet their own needs. The concept of livelihood is rapidly gaining acceptance as a valuable means of understanding the factors that influence people's lives and well-being. 'It is comprised of capacities, assets, and activities required for means of living. A livelihood will be sustainable when it can cope with and recover from stress and shocks and maintain or enhance its capacities and assets, both now and in the future, while not undermining the natural resource base'. Sustainable livelihood is a way of thinking about the objectives, scope and priorities for development, in order to enhance progress in poverty elimination.

At present increasing rate of deforestation in North-east India stands as threat to sustainability of the tribal people of this region. Traditionally they depend on forest resources for their livelihoods. Their dependence on forest was not merely for livelihood but for their cultural requirement. For these people, forests are an important source of livelihood and means of survival. Most of tribal people are completely dependent on the forest for their livelihood. Destruction of forests over the past few decades has deprived tribes of their livelihood, particularly source of food. Tribal households of this region are also greater dependence on wild plants for medicinal purpose.

Destruction of forests leads to destruction of medicinal plants. Damage of forests and other aspects of nature could have effects on living standards of the world poor and reduced global GDP. Deforestation in other words is an expression of social injustice (Colchester and Lohmann, 1993). The social consequence of deforestation is many, often devastating long term impacts. The intrusion of outsiders destroys traditional life style, customs and religious beliefs which intensifies with infrastructure development like construction of roads which result in frontier expansion often with social and land conflicts (Schmink and Wood, 1992). Deforestation also creates the following problems on sustainable development.

Soil erosion

Deforestation makes soil prone to erosion by agents such as wind and water. The root of trees holds the particles of soil together thus, preventing the fertile top soil from being carried away. Soil erosion leads to loss of productivity of the land. Erosion from deforestation is a problem in the countries of the world.

Loss of Biodiversity:

The destruction of forest cover has resulted to degradation environment with reduced biodiversity. Many wonderful species and plants and animals have been lost and many other remain endangered. It is estimated that about 50 to 100 species of animals are being lost each day in the world as a result of destruction of forests. The region has at least 7500 flowering plants, 700 orchid, 58 bamboos, 64 citrus, 28 conifers, 500 mosses, 700 ferns and 728 lichen species. The region is equally rich in faunal diversity. An estimated 3624 species of insects 50 molluscs, 235 fishes, 64 amphibians, 137 reptiles, 541 birds and 160 mammalian species have been identified (Report of North East India). Increasing rate of deforestation of this region stands as a threat to its biodiversity.

Human and Animal Conflict:

The, forests do not provide place for the animal to roam day but also provide their food and act as a source of protection. As a result of deforestation animals lost their habitat. Which result conflict between human and animal? In recent years human-elephant conflicts are increasing in Assam as well as in North East India. In human — elephant conflict not only in loss of agricultural crops but also human and elephant lives.

Greenhouse Effect and Global Warming:

Nature balances the flow of energy and nutrient. Plants absorb carbon dioxide from atmosphere and use it to produced food. In return it gives of oxygen. Accumulation of carbon dioxide in the atmosphere acts as a blanket that traps long wave radiation of heat and prevents it from escaping the surface of the earth back into atmosphere. This phenomenon is known as the greenhouse effect. The trapped radiation is converted into heat. This heat causes global warming. Tropical deforestation is responsible for approximately 20% of world enhanced greenhouse gas emission.

Strategies to reduce deforestation:

Thus the country's as well as the North Eastern state's forest resource is under tremendous pressure. Intensified shifting cultivation, growth of industries, urbanization, increase of population etc. has led to deforestation. At present problem of deforestation is a worldwide phenomenon. To remove this problem following steps should be undertaken.

- * **Increase area of forest plantation;**
- * **Promote sustainable management.**
- * **Increase the area and standard of management of protected areas.**
- **Increase the area of forest permanently reserved for timber production.**
- **Strengthen government and non-government institutions and policies.**
- **Increase the consciousness about the negative effect of deforestation among the people.**
- **It is necessary to reforestation in another place if any industry destroy forest for establishment of industry.**

CONCLUSION:

Development cannot be sustained in a deteriorating environment, and environment cannot be protected when economic growth does not take into account the cost of environment destruction. Deforestation becomes a threat on sustainability of the tribes as well as over all sustainable development of this region. It has serious effect on human and environment. Forests are a valuable environmental and economic resource for supporting natural system and improving human welfare. For conservation of forests many steps were taken in India. Article 48A of the constitution of India states that the state shall make attempts to protect the forest and wildlife in the country. Article 51 A deals with the citizens' duty to value and preserve the rich culture of the country along to protect and improve the natural environment which includes forests, lacks, wildlife etc. In 1980 Forest Conservation Act was enacted in India. In North East most states forest department have emerged since

1970. The Joint Forest Management is one of the conservation aims of conservation of forests through community participation. The major-objectives of JFM are to support the livelihood of the first fringe communities through sustainable natural resource management which community participation. Through these provisions were undertaken to conserve forests or to protect forests, still it is not possible to control the problem deforestation. If this process will be continue for a long time it will be create serious problems in the sustainability of the region. So every person of should be conscious to remove this problem of deforestation and everyone do should plantation.

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