CHAPTER- 2

LITERATURE RVIEW

Chapter 2

Literature Review

2.1 Introduction

There is a lot of literature on the human-nature relationship, forest, and conservation, but it does not sufficiently explain the study area's problems. Nevertheless, they did throw light on some similar kind of cases, but we need more close study on it. Thus, for the research work" dependence on forest resources and its impact on biodiversity conservation: a study of Kokrajhar district, Assam", the following literature review has been done for the present study. The thematic ways of the literature review are given below:

Literature related to forest and forest conservation

Literature related to uses of forest resources

Literature related to community forest conservation

2.2 Literature Related to Forest and Forest Conservation

Stebbing (1927) did comprehensive work on the conservation of the forest of India in his book *The forest of India*, 3 volumes. In chapter X of volume II, he had devoted his attention to Forest operation in Assam from 1871 -1900. In this book, he highlighted the valuable forest of 5 undivided districts of Assam, such as Luckimpure (presently known as Lakhimpur), Nowgong (present Nagaon), Sibsagar, Naga Hills (presently known as Nagaland), and Khasi and Jyntiah Hills (Presently known as Meghalaya). Out of these, he revealed that the extensive forests of the *Pinus longifolia* (Pinus Khasya), which were found in the hills

around Shillong, suffered from destruction by the owners themselves. Government was unable to interfere in the management of these private forests.

Stebbing's gave a brief description of the methods of exploitation in the forest of Khasi and Jaintia Hills (present Meghalaya). Out of many factors, he made particular reference to the working of lime and coal for local consumption in Shillong and Cherrapunji. Thus, the author realised the intensity of the problem of denudation of forests in these hills at the time when iron smelting was carried out extensively by using firewood, especially along the western portion of the Khasi Hills.

Furthermore, the author rightly observed that though these Forest Conservancy measures had met some success, but they faced certain problems like assuring the local people of the "temporary inconvenience" for the "future benefit". Comparing the case of Europe with that of India, he feels that though initially, it is difficult to change people's habits, the realisation of Forest Conservancy's benefits could come only through the education of the people**.**

Bahaguna (1994), in the article entitled, "Collective Forest Management in India", tried to analyse the relationship of conservation of natural resources with the active involvement of local people. Approximately 23 % of the landmass of India is covered by forest and is controlled and managed by the government. But, the gap between people and government machineries in management of forest led to degradation of forest due to intense biotic pressure mainly on account of overgrazing and fires. The New forest policy of 1988 clearly states that the management of forest resources in India should include the active involvement of local people and share the benefits from the forest through the constitution of Villages' Forest Protection Committees (VFPCs). For the detailed study, he reviewed the functioning of 155 VFPCs in Harda forest division, Madhya Pradesh, and included the issues dealing with common property resources management. He found that the collective management of natural resources

successfully rehabilitated villages' ecosystems and provided much-needed inspiration for people's welfare activities.

Tiwari (2010) conducted a comprehensive study on Joint Forest Management of Jharkhand with the objective to see the impact of Joint Forest Management (JFM) on rural development through the nature of employment generation from forest activities, the composition of income from forest resources, a comparative account of management in pre-JFM and post-JFM periods, overall ecological, economic and social impact of JFM. While selecting the sample, he used the census method and covered all the household of two tribal villages, namely Argandi and Bagmundi in Barhait and Borio block of Sahibganj district of Jharkhand. The study found that the Joint Forest Management has given the sense of belonging to forest resources in the areas as a result of which the communities in the selected region have been benefited in various forms - such as improved employment opportunities, increase income of households, self-initiated forest protection initiative, soil and water conservation and enhanced land productivities. But at the same time, it also found that the forest department had dominant over control of resources, funding and other decisions over the forest. Thus, village communities and state governments need good coordination of forest use, dependencies, protection, and balancing social, economic, and ecological objectives for viable management.

Kubiszewski et al. (2012) conducted a comprehensive study on the value of ecosystem services in Bhutan and its neighbouring countries with the objective to evaluate the contribution of natural capital to Gross National Happiness (GNH). They have reported that the contribution of natural capital in the Gross National Happiness (GNH) and its contribution to overall sustainable human well being as express by the nine domain of GNH: psychological well-being, health, education, culture, time use, good governance, community vitality, ecological diversity and resilience, and living standard. They have estimated the value of ecosystem services in Bhutan using benefit transfer methodology in order to determine an initial assessment of their overall contribution to human well-being. Their study

found that the total estimated value of ecosystem service in Bhutan was approximately US $ 15.5 billion/yr (NU 750 billion/yr.), significantly greater than the Gross Domestic Product (GDP) of 3.5 billion/yr.

The study also estimated that 53 per cent of the total benefits of ecosystem services have accrued to people outside Bhutan. 47 per cent of the benefits accrue inside the people of the country -15 per cent of the national level and 32 per cent at the local level. Based on this and a population of 700,000, they have estimated Bhutan's combined per capita annual benefits at US $15,400/capita/yr, out of this, US $5000 is from goods and services captured in GDP, and the US $10,400 is from ecosystem services. This is only a partial estimate of GDP, and that leaves out other sources of benefits for people, including social and cultural values.

Narayan et al. (2012) analysed the historical perspective of forest cover changed in the Upper Brahmaputra Valley of Assam during the pre-colonial, colonial and post-colonial period's respective political regimes. The study found that the rising population, which was linked to immigration from neighbouring regions, dwindling share of agriculture in states gross domestic product, and incentives to small tea growers in risk-prone agricultural landscapes were the main challenges securing forest cover in this region. Further, they found that the empowerment of local communities and institutions, understanding tea plantations, and demographic change is crucial for forest conservation.

Sharma and Sarma (2014) in their research article entitled 'Issues of Conservation and Livelihood in the forest villages of Assam' tried to highlight the creation of forest villages during the British rule as management of forest policy. Their study found that initially, the forest villages were established within the limits of the reserved forests for assured and regular supply of labour for the colonial forest department. Later, more and more forest villages have come up and made claims on forest land, leading to the conflict between the forest department and forest villagers. This conflict in recent times has rising the contestation and

challenges with regard to the people's rights and conservation approaches adopted by the state government.

2.3 Literature Related to Use of Forest Resources

Silori (2007) in his article, "Perception of local people towards conservation of forest resources in Nanda Devi Biosphere Reserve, north-western Himalaya, India", tried to examine the perception of Bhotiya Tribes on various issues related to the use and conservation of forest resources in Nanda Devi Biosphere Reserve (NDBR), India, with an objective of identifying the various bottlenecks in the sustainable management of forest resources through peoples participation and generation of better livelihood opportunities. For the detailed study on the perception and understanding of local people, 45 sample households were selected from three villages viz. Reni, Lata and Malari. The study found that, despite having more than 80 % of respondents supporting the concept of conservation of forest through the creation of Nanda Devi National Park in 1982 and NDBR in 1988, there was a negative attitude among local people towards NDBR management. This is mainly due to restrictions imposed on them from forest resources access for maintaining their daily requirement. The promotion of some alternative income-earning activities was responded to positively by the local people.

De (2012) in his article entitled, "Livelihood, dependence on forest and its degradation: evidence from Meghalaya", tried to find out the linkages between the population growth, the pattern of livelihood and dependence as well as degradation of forest, with the objective to unfold the nature of dependence on forest and factors affecting the degradation of forest in Meghalaya in an interlinking fashion. To study the interlinkage between population growths with dependence on forest, he has selected 160 families purposively for sample unit from four villages viz. Mawtawar, Laitjem, Sohhiong and Mawlangkhar. In the study, he found that family size, incidence of poverty, cultivation practice, remoteness of the area, and consumption or livelihood pattern have an important

impact on forest resources extraction. Further, he also found that education can help in the conservation and sustainable use of forest resources. Broadly, he found that there are important inter-linkages between population growth, the incidence of poverty and dependence, and the degradation of forest in the region.

Shangliang (2013) in her book entitled, “Socio-Economic Dimensions of Forest among the Khasis", has done extensive work on the role of forest in Khasis socio-economic structure. Her main objective of the study is to trace the role and parameters of forest usage in the Khasis' socio-economic life and throw light on the various National Forest Policies and forest legislation passed by the Government of India. The book has nine chapters; an in-depth study was conducted by covering such aspects as the origin and history of Khasis, their relationship with the forest, the history of forest from the colonial period to till now, and the forest department's activities. For the detailed study, she has conducted a sample survey on two distinct groups of people- one group or section of people who live in the forested village, namely Lawbyrwa Villa, consist of 60 households and primarily depend on their livelihood on forest and forest produce, and other groups of people are those who live away from the forested village, i.e. Madam Iiang Syim Village consist of 185 households and departed from their traditional forest-based economy and adopted new occupations and lifestyle as a result of the changed environmental and socio-economic situation.

The study found that the forest continues to hold an important place in Khasis's life and culture. There has been an infringement on the people's traditional rights over the forest, and there is a gradual but inevitable shift in the Khasis economy from the forest-based livelihood to a diversified economy.

Tripathi et al. (2016) in their article entitled "Perspective of Forest Biodiversity Conservation in Northeast India," have presented an overview on the current state of forest biodiversity and its conservation strategies in Northeast India, including traditional knowledge of conservation in the northeast region in India. The immense variety of climatic, edaphic, and altitudinal variations in this

region constitute a great range of northeast India's ecological habitats. The region represents the sub-tropical belt that extends from the foothill of the Himalayas in the west to southeast China in the east. Thus, as part of the Indo-Burma biodiversity hotspot, Northeast India is one of the still relatively undisturbed regions of the world, harbouring rich variation of flora and fauna of the Indian subcontinent. Their study found that due to an economically backward region coupled with a lack of alternative source of livelihood, traditional shifting cultivation is widely practised in this region. Thus, the shifting cultivation has degrading forest ecosystem and affecting biodiversity conservation in the region. Further, they have emphasised the various approaches of biodiversity characterisation using information technology like GIS to plan proper conservation and prioritisation for sustaining the region's biodiversity.

Fikir et al. (2016) in their research article “Economic contribution to local livelihood and household’s dependency on dry land forest products in Hammer district, South-eastern Ethiopia", they have conducted the study in Humar district, South Ethiopia, to provide empirical evidence on economic contribution to local people and household dependency on dry forest products. For the detailed study, they have stratified the district into two- based on agro-pastoral and pastoral kebeles (administrative units of the district), and data is collected through a household survey. Altogether 164 sample households of both kebeles (administrative units of the district) were selected based on a random sampling procedure. The study found that income from forest product contributes 21.4% of annual households' income. The major dry forest product includes honey, fuel wood, gums and resin, and crafts and construction materials. Households of the pastoral site earn more forest income and are relatively more dependent on forest products income than those agro-pastoral sites. Further, the study reveals that the various socio-economic and contextual factors were found to influence the forest income and its dependency.

Katel and Vogt (2011) had examined the use of forest resources, knowledge and perception of park management interventions on local residents in

Jigme Singye Wangchuck National Park, Bhutan. In the study, they have found that local people depend on forest resources for their livelihoods. Their traditional knowledge and perceptions of the park and park management are influenced mainly by constraints on their access to forest resources and by benefits and incentives obtained from the park administration through socioeconomic development.

Chatterjee (2008) had examined the issues related to biodiversity conservation in Northeast India. Northeast India is one of the most biodiversity rich-regions of the world. He has highlighted that the region is not a homogenous geographical entity and the conservation issues vary from state to state. The region is influenced by the demographic composition, governance structures and socio-political situation. Further, he found that the recent discoveries of new species in the region further strengthening the conservation efforts in the regions. The region also provides an immense opportunity for its stakeholders to exhibit a balance between conservation and development so as to reflect the sustainable use of its and ensure livelihood security.

2.4 Literature Related to Community Forest Conservation

Dustin and Ghimire (2003) in their study "Synergy Between Traditional Ecological Knowledge and Conservation Science Supports Forest Preservation in Ecuador", they have examined the interaction between indigenous and scientific ecological knowledge to preserve ecosystem services and biological diversity at Loma Alta, an own community watershed in Western Ecuador. The empirical studies have been done at the rural farming community of Loma Alta, where the community has legal property rights of 6842-ha watershed in Western Ecuador. Loma Alta watershed has matured tropical forest and stands of large trees, and epiphytes trap an order of magnitude of more water from fog than areas of pasture or crops. The study found that the local self-governing community reduced their use of forest due to the scientific evidence that more and more use of forest

resources would reduce water supply to the community. As a result, the community has modified their traditional knowledge, cultural traits and gives space to the modern scientific use of the forest for sustaining ecosystem service and biodiversity in a forest commons.

Hazarika (2009) had extensively analysed the Northeast region's ecology and its interrelationship between economic developments. The author has highlighted the rising awareness for environmental conservation, estimation of the district-wise presence of illegal migrants from the neighbouring country, Bangladesh, in his book "*Economic Development and Ecological Balance in Assam: Problem and Prospect*". The book has delved into forest cover, flora and fauna, availability of mineral and natural resources, degree of dependency of rural people in nature and natural resources and the future requirement of natural resources, the changing trend of ecological balance, population trend and density in the state, changes in environmental quality, the ecology and economic development, the link between the modern type of development and ecological degradation and finally, the policy prescription for pollution control and conservation of serene environment in the state.

Noe and Kangalawe (2015) had highlighted in their study that how community involvement in conservation has both empowering and disempowering effects on the community. For the detailed study, they have selected two sample villages from the Namtumbo district of Southern Tanzania – first village represents having involvement in wildlife protection, and the other village does not involve in wildlife protection and conservation. Their study found that the relationship between community participation in conservation and economic empowerment remains problematic after two decades of community-based conservation intervention.

Ghosh (2015), in her research paper entitled, "Conservation and conflict in the Sundarban Biosphere Reserve, India", has examined the conflict between local fisherman and conservation needs, broadening the understanding of human-

environment relationships in the Sundarban region of India. Global climate change has endangered the extinction of most of the wild animals of the world. The Sunderban Biosphere Reserve (SBR) in West Bengal, India, which is part of the world's largest mangrove forest, has recently faced a number of socio-economic and environmental problems such as global climate change, rising sea level, erosion, loss of mangroves, lack of freshwater, and habitat loss of Bengal tiger. The study has found that the age-old fishing community depend on their livelihood by fishing in the forest, but the State Governments strict restriction on catching fish in the core and buffer areas of the biosphere reserve has lead to the conflict between forest officials and local fisherman. Therefore, to balance biodiversity conservation, the resource management policy in the Sundarban must directly involve the fishing communities, which primarily depend on forest-based fishing.

Horwich et al. (2015) in their article entitled, "*Creating Modern Community Conservation Organizations and Institutions to Effect for Successful Forest Conservation Change"*, have examined that current conservation strategies have failed despite the increase in investment to stop the environmental degradation and loss of biodiversity. Alternatively, after 30 years of experience in Community Conservation, they claimed that they had developed a successful, cost-effective, field-tested flexible formula to catalyse the community to stop deforestation and biodiversity loss. Based on trust, initially, they aware of the community about their special forest and wildlife and then asked their help for protection on them. They helped them to create Community Based Organisations (CBOs) and built a federation of conservation activists to strengthen and empower them to manage their natural resources. The case histories from Assam, India; Northern Peru; the Huon Peninsula Papua New Guinea; Madagascar; Belize and Wisconsin, USA demonstrate success based on CBOs and community federation, allowing the community to play a powerful role in protecting and restoring the forest.

Mugido and Shacleton (2017) conducted a study on the contribution of Non-timber forest products (NTFP) trade to rural livelihoods in the different agro-

ecological zone of South Africa. Their main objective of the study was to establish the proportions of household trading in NTFPs in sites of different distances to the urban market and agro-ecological areas of South Africa. For a detailed study, they have selected and interviewed 200 households from the areas of varying agro-ecological potential. The study showed that about 6.4% household reports selling NTFPs for various reasons, with many (22 %) citing need to earn cash income and limited employment opportunities (16.9%). Even though the returns from trading NTFPs are relatively low, every earning is very important to many cash- strapped rural households. Further, they have demonstrated that many sellers of NTFPs used their earnings to augment household income and cover their living expenses.

Mukul et al. (2010) tried to examined stakeholders understanding of non-timber forest products (NTFPs), their harvesting, sustainability issues, prospective role in conservation within Protected Areas (PAs) and their present contribution to household livelihoods. The study found that in the north-eastern PA of Bangladesh, namely the Satchari National Park, NTFPs provide a significant part of household livelihoods and income, even in PAs, and households place a high value on their conservation potential. Further, they have found that households also believed that the present NTFPs schemes are ecologically benign or less harmful, but further investigations are required to assess the ecological compatibility of traditional harvesting practices and management.

Erikson and Klapwijk (2018) in their article entitled, "Attitudes towards biodiversity conservation and carbon substitution in forestry: a study of stakeholders in Sweden", they have examined the environmental problem, awareness, forest belief and environmental management attitudes (biodiversity conservation and carbon substitution) among stakeholders in Sweden, and explored the effect of local biodiversity versus global climate change frame on attitude. In Sweden forest, stakeholders include forest owners, the forestry industry, and groups representing various interests such as recreational, environmental and endogenous groups. They have studied based on both ownership and environmental/recreational interest groups (membership sample)

and among the students (student sample). The study found that owner groups were more positive towards carbon substitution in the forestry, the nature groups were more positive towards biodiversity conservation and carbon storage. Further, they found that awareness of biodiversity loss and eco-social belief influenced attitudes towards biodiversity conservation among the stakeholders.

Sonowal (2007) in his article "Demographic Transition of Tribal People in Forest Villages of Assam", has highlighted the creation of forest villages of Assam for forest management under the colonial government in the early part of the last century. In the study, he has rightly cited that the need for the regular supply of labourers for forest exploitation was met through the introduction of the 'Taugya' system, where the labourers were given some plot of land to cultivate in lieu of their physical labour in forestry works. This settlement or colonies of labourers established by the forest department is later known as forest villages. Further, he found a general perception that forest villages were inhabited predominantly by tribal people over the period of time. But, in the present study, he found that the other communities have numerically outnumbered the tribal populations living in forest villages in Assam.

Tiwari et al. (2010) in their article, "Forest Management practice of the tribal people of Meghalaya, North East India", they tried to examined the traditional knowledge of forest management of Meghalaya with an objective of associated knowledge of the conservation of biodiversity in general and medicinal plants in particulars. Further, the study highlights tradition of the tribal peoples of Meghalaya and their contribution to the healthcare, food security and also forest related knowledge.

Ghosal and Liu (2018) in their paper entitled “The chronology of community participation in Indian forest management", tried to find out the chronological change in Indian participatory forest management and its impact on socio-economic issues of the native dwellers. Their study found that forest management and forest protection are not possible without the active participation

of native peoples and their socio-economic improvement. Therefore, community participation in forest management and conservation of India's present days has shown that it is an evolving process, embedded within local socio-ecological systems and negotiated between the state and local communities.

Obua et al. (1998) in their research note “Attitudes of local communities towards forest management practices in Uganda: the case of Budongo forest", tried to find out the attitude of local communities towards forest management. For this, simple random sampling without replacement of 200 households of Budongo Forest, Uganda, was selected for the study. Their study found that due to the imposition of strict rules by the forest department on forest resources utilisation in the Budongo reserve forest, the local community has developed negative attitudes towards forest management practices.

Talukdar and Gupta (2017) had tried to examine the attitudes towards forest and wildlife among Rabha, Bodo and Rajbongshi communities from three villages in the Chakrashila Wildlife Sanctuary of western Assam, India. For the detailed study, they have interviewed sixty-nine respondents of three villages, i.e. thirty-seven from Jornagra, seventeen from Bandarpara and fifteen respondents from Kaljani villages of Chakerasilla Wildlife Sanctuary of western Assam. In the study, they found that the attitudes of the communities were governed not only by their material needs and priorities but also by their deep-rooted cultural-religious bond with the forest.

Mahanta and Das (2013) in their paper "Attitudes towards biodiversity conservation of forest dwellers and encroachers: a case study of Assam in north-east India", tried to examine the perception and attitudes of the forest dwellers of village forest and encroachers towards biodiversity conservation. In their study, they have found that the majority of respondents have positive attitudes towards environmental issues and protection of biodiversity loss in particular. They also observed that village types, occupation, caste, source of fuel wood for cooking, educational qualifications and size of landholding were significantly associated

with attitude towards biodiversity conservation. Thus, from their observation, they have suggested that conducting an environmental education program and the right holders monitoring system on the impact of their use of forest resources will support biodiversity conservation.

Heinen and Shrivastava (2009) had examined the awareness and attitudes as a function of the demographic and socio-economic variability of villagers living near Kaziranga National Park, Assam. The study observed a high variation in attitudes and awareness as a function of the ethno-religious group, educational level, and socioeconomic and immigration status, indicating more and different needs for economic interventions within some communities than others. They have found that there was a high degree of conservation awareness among the communities, but most of the people expressed negative conservation attitudes due to the loss of their crops to wildlife. Their findings imply that highly localised development schemes and participatory approaches to resource management at the village level, coupled with greater efforts at education, are especially needed to achieve conservation and development goals in the area.

From the review of all the available studies on forest resources uses and different aspects of it in India and other parts of Assam, it is clear that there are scarce studies on the economical benefit aspects of forest resources. Though the forest resources is an important source of livelihood of the marginal and weaker section of the community, especially Schedule tribe and other forest-dwelling communities, it has so far not been able to attract much attention from the researcher. Therefore, an attempt is made here to analyse all the economical benefits and conservation aspects of the forest resources, including the livelihood of the tribal and marginal section of society, benefit or income from forest resources, the relationship between forest income and socio-economic conditions of forest dwellers, perception and attitude of forest dwellers towards biodiversity conservation etc.