Turkish Online Journal of Qualitative Inquiry (TOJQI)
Volume 12, Issue 6, July, 2021: 5240 - 5267

Resource Base Of North East India; Problems And Prospects: A Descriptive Study

Bidyutt Bikash Hazarika[1] Devasish Hazarika[2] Debajyoti Dutta Saikia[3]Amrit Kumar Nath[4]Manjil Hazarika[5]

Abstract:

North East India, consisting eight prospective states, have been carrying a bright historical journey with its own resources. It includes a total area of 2,62180 km2, covered by eight countries, including Assam, Arunachal Pradesh, Meghalaya, Manipur, Mizoram, Nagaland, Sikkim and Tripura, accounting for around 8 percent in total, of which 40 million are inhabited. The Northeast of India has immense unspent natural resources and is recognized as India's East-Look Policy gateway. In this paper, we are making a serious attempt to disclose the resource base of the region in a comprehensive way. In this study, natural resources in the form of mineral resource, water resource, land resource and forest resource are considered for analysis. Besides the natural resources, in the last part of the paper, an analysis on human resources of the region is also given which is the very essential one to transform the other resources into a ray of blossom. The region is full of potentials on the one side, but surroundedwith problems as well. In this study, we are trying to discuss those in a detailed way. For the study various secondary data are used from many authentic sources.

JEL Code: R1, R11

Key words: North-east India, natural resource, problems, prospects.

1. Bidyutt Bikash Hazarika, Research Scholar, Department of Economics Dibrugarh University, Assam, India. MailID: hazarikabidyutt@gmail.com
2. Devasish Hazarika, Research Scholar, Department of Economics, Mahatma Gandhi Central

University, Bihar, India.Mail ID: hdevasish@gmail.com

3. Debajyoti Dutta Saikia, Department of Geography, North Eastern Hill University, Shillong, India. Mail ID:debadutta0707@gmail.com
4. Amrit Kumar Nath, Lecturer, Department of Economics, D. R. College, Golaghat, Assam, India. Mail ID:amritkrnath01@gmail.com
5. Manjil Hazarika, Department of Geography, Gauhati University, Assam, India. Mail ID:ma

1. Prologue:

In North East India, the region comprises a total geographical area of 262,180 km2, which is some 8 per cent of the country's overall area, with a population of around 40 million, encompassing eight states, namely Assam, Arunachal Pradash, Meghalaya, Manipur, Mizoram, Nagaland, Sikkim and Tripura. The Northeast of India has immense unspent natural resources and is recognised as India's East-Look Policy gateway. Typically, the region's natural resources are land, forest and mineral resources. North-East India's resource base has had great potential to boost the region's economy. Although the region is rich in natural resources, it is often seen as less developed than other sections of the country. Since the independence of India, numerous difficulties have suppressed the northeastern region. To meet the challenges, optimum utilization and efficient direction of natural resources are needed, and in this context, the concept of human resource development has come up. Hence in this paper, along with the natural resources, thestatus of human resource of the region is also considered.

Number of studies has been done so far in this area. Keeping objectives in view, a brief review of relevant literatures has been made. Mirinchonme M. et al. in their research paper *"Natural Resources and Socio-Economic Development in North East India"* discussed the difficulties that cannot be solved; addressed if only, and identified the gap between the development policy to be pursued for the northeast and the reality. 1 They also assumed that the emphasis should be "planning with the north east" for the benefit of its citizens, instead of "planning with the north east," through industry perspectives in the region. in their paper L.C. De and Singh DR. *"Natural Resources in North East Region of India"* highlighted in greater detail the
potential side of natural resources. To these countries, North East India has
fragility, marginality, inaccessibility, cultural heterogeneity, ethnicity and biodiversity abundance. The writers examined the terrain, soil, minerals, woods, as well as the biodiversity and several indigenous agricultural systems in depth. Environment & Water Resource Management Unit of Sustainable Development South Asia Region in its strategy report *" Development and Growth in North East India, the Natural Resources, Water and Environment Nexus"* Tried to focus on the region's water and forests, two main interrelated resources and the institutional framework for its administration. These are plentiful and renewable resources and are tied to important growth and development opportunities. This report is a World Bank document that has been validated. In his work, Mishra S.K. analyses certain aspects of human resources in North East India, discussing numerous problems and difficulties to the development of the region's natural resources.

2. Objectives of the Study:

The paper tries to address the following specific objectives:

i. To study the present status of the resource base in the states of North-East India.

ii. To explore the problems and prospects of NER with respect to resource base.

3. Methodology:

The study is both explanatory as well as descriptive in nature. The data presented here are

basically collected from secondary sources like journals, research papers, different websites, census etc.

4. Result and Discussion:

In this section of the paper, five different heads are taken for analyzing different

resource base possessed by North East India. They are:

1. Mineral resource
2. Water resource
3. Land resource
4. Forest resource and
5. Human resource

Mineral Resource:

Coal, petroleum crude, natural gas, limestone, sillimanite, dolomite, uranium, china clay, kaolin, fuller's earth, feldspar, and other minerals are among the available mineral resources in this area. Assam and Meghalaya are the states with the most coal production. Small deposits of petroleum crude are also accessible in the Changlang region of Arunachal Pradesh and the Brahmaputra region of Tripura, in addition to Assam's large oil and natural gas deposits. The entire existing crude oil resource of NER's proved oil resources is estimated to be 158 million tones. Natural gas is also abundant in the area. In Assam and Tripura, natural gas is accessible. The total natural gas resource in the area is estimated to be about 23 thousand million cubic metres. The IOCL (AOD) Digboi Refinery has been utilising natural gas for boiler fire and afterwards for electric power production for nearly four decades. Assam Gas Company Limited also supplies natural gas to several Assam Tea Gardens for usage in the tea processing industry through its pipeline. Namrup Thermal Power Station will provide electricity for Brahmaputra Valley Fertilizer Corporation Limited, which will produce fertiliser. Assam Petrochemicals Limited, Namrup, for Methanol production and to NRL for crude refining. The gas generated by ONGCL at Baskandi and Adamitila in the Barak Valley is used by the Private Generation Corporation (DLF Power Ltd) to generate electricity and in the Tea Gardens. Tripura also has a substantial supply of non-associated natural gas. In the

NER, there is enough limestone to build a few cement mills, and Sikkim Mining Corporationhas been mining copper, zinc, and lead concentrates in small amounts.

Table-1: The following table shows the Mineral Resources of different states of North-Eastern region:

States	Minerals
Arunachal Pradesh	Coal, petroleum, limestone, dolomite
Assam	Coal, granite, iron ore, feldspar, natural gas, limestone, sillimanite, quartzite, clay, oil
Meghalaya	Coal, Granite, iron ore, limestone, clay, quartzite, feldspar
Mizoram	Coal, natural gas, limestone
Manipur	Limestone, Chromite
Nagaland	Coal, oil, natural gas, limestone
Tripura	Kaolin, limestone, iron ore, natural gas
Sikkim	Zinc, copper, lead, coal, dolomite, talc, graphics, quartzite

Source: Statistical handbooks of different North Eastern States.

In Arunachal Pradesh, the production of petroleum is approximately 44 thousand metric ton. In Assam, the coal reserve of 371 metric ton is estimated and the production rate of crude oil is estimated at 4.80 million metric ton per annum. It has carried a potential to tap natural gas at 5.93% million cubic meters per day. Umrangshu (Assam) holds the limestone

reserve of over 400 metric ton and therefore has all the cement plants of the region in this single location. Meghalaya carries a huge deposit of coal at an estimated reserve of 564 million tone. It reserves a deposit of 4147 million ton of limestone, but the currently extractable reserve of limestone is only 0.24-0.30 million ton. The state is also famous for its reserves of Uranium. Sikkim holds rich resource of all the minerals; the Sikkim Mining Corporation has made commercial exploitation of some of these minerals. Tripura has been carrying a substantial amount of natural gas reserves. According to ONGC (Oil and Natural Gas Corporation) exploration results, the region has a production potential of 3.5 millioncubic meter of gas per day.

Prospects of Mineral Resources in North-East India:

This area is gaining national attention, with certain states outperforming the national average in terms of both economic development and socioeconomic advancement. Assam and Meghalaya account for the majority of the accounted mining industry in the Northeast. Assam's natural gas contains a lot of petrochemical components. LIDPE, HDPE, Ethylene, Butadiene, Propylene, and other polymers can be stripped and broken down into individual components. These components are used as raw ingredients in the production of other products. To meet the needs of the region's population, as many as 3000 polymer-based units with a processing capacity of 100 MTPA can be set up in the small and medium sector. It will be a good substitute for jute and wood-based materials in the Tea industry in Assam, which is worth Rs.54 billion. It has a potential market in Bangladesh, Burma, and Nepal, which are all nearby. With the completion of the petrochemical project, the industrial landscape of this undeveloped area is projected to shift dramatically. As a result, downstream small scale industrial units will get a significant boost, and the region's inhabitants will have more work prospects.
Assam and Meghalaya has a huge reserve of coal which is known as *„Black Gold"*. In

addition to other significant minerals, the NER is said to contain a 395 million ton coal deposit. “A total resource of 1642.64 million tonnes of coal has been estimated from the three states of Meghalaya, Assam, and Arunachal Pradesh,” said Mulkh Raj Jarngal, the additional Director General and Head of the Department of GSI, NER. Due to its unique composition of low ash, Assam coal has a significant potentiality for the development of a large number of industries, contributing substantially to the NER's GSI. Steel factories in Assam may utilise Assam coal for metallurgical reasons. In reality, Assam coal is now being used to make coke in several of the country's steel mills. Sankardev Coke Products Pvt. Ltd. has installed capacity of 9450 TPA. Limited Liability Company produces bee-hive coke by combining coal from Assam and Meghalaya. The product is in high demand in the graphite production industry. Cement plants, as well as graphite electrode alloy casting. It has been supplying 400 MT of coke per month to a Durgapur-based graphite industry. Assam coal has a low ash level and high sulphur content, making it ideal for fertiliser production. As a result, the NER has a lot of potential for coal-based industrial development.

Limestone industries have a lot of promise in the NER as well. Following Jharkhand and Andhra Pradesh, Meghalaya has the third-largest uranium deposits. Limestone is an extremely versatile mineral with over two thousand applications. Cement, a limestone product, is in great demand and has a wide range of applications not just in the area but also across the nation. Cement and steel consumption per capita are used as indicators of development since they aid in the building of infrastructure. There's a chance that a number of lime kilns might be built near the sources. The paper industry and building construction activities are the primary consumers of lime in Assam, hence this business has a promising future.

Ceramic raw materials (China clay, fireclay, and feldspar) play a significant role among the numerous minerals accessible in NER. Ceramics, paper, rubber, textiles, paint,

chemicals, and cosmetics are just a few of the sectors that utilise china clay. China clay is mostly purchased by NER's paper mills. With the rise in population and aspirations for a better quality of life, the demand for ceramic items is only going to rise. ASEB and Meghalaya State Electricity Board, post and Telegraph departments, and given the prospect ofsubstantial hydro power production in NER, there is a strong need for high tension and low tension porcelain insulators.

Granite sector has a great deal of potential in the area as well. Granite tiles may bemade in a variety of ways, including by treating granite blocks in different units. The need for polished granite slabs will expand as the number of public buildings, hotels, and movie halls increases. As a result, we may conclude that NER has a promising future for a vast range of mineral-based enterprises. The restoration of suspended units and the construction of new ones should be undertaken now that the resources and marketability are available.

Problems of Mineral Resources in North-East India:

Despite its economic significance, the mining sector in the NER has long been beset by a slew of problems. These issues are mostly the result of confusing rules and regulatory barriers that have allowed corruption and environmental degradation to flourish unchecked. The restriction has had a negative effect on Meghalaya's economy since coal mining accounts for seven to eight percent of the state's GDP. Meghalaya lacks a strong mining regulatory framework.

Mineral mining in the Northeast, particularly coal mining in Assam, uranium mining in Meghalaya, and limestone mine in Meghalaya, has been linked to deforestation, air pollution, and water pollution. While environmental contamination is one of the main causes for people's opposition to mining projects, the relocation of indigenous people in the area is another critical issue. Mining is often regarded as one of the most contentious economic activity on the planet. One of the most serious issues is the lack of access to safe and clean

drinking water, since the majority of rivers and other water systems have been affected by toxic discharge from chromium and limestone mining. It is linked to the release of radioactive substances, and as a result, the health effect on nearby residents will be tremendous.

Some of the obvious environmental consequences of limestone mining include the loss of forest cover, pollution of water, soil, and air, depletion of natural flora and fauna, reduction in biodiversity, erosion of soil, instability of soil, and rock masses, changes in landscape, and degradation of agriculture land. Mine and cement plant owners should pay close attention to the environmental challenges that exist in the region.

NER contains a considerable amount of coal, however it has a high sulphur concentration, making it unsuitable for power production. Similarly, despite possessing a great amount of natural gas, the NER was only able to use a small percentage of it, resultingin massive amounts of natural gas flaring up on a frequent basis. Another issue related with the mining of NER is a lack of finance. In truth, the area has always had ample resources, buta significant amount of the monies allocated for different initiatives has not really gone into those initiatives (Human Development Report). In recent years, the Indian government has focused on the Northeastern states, launching programmes to strengthen abilities and competences in order to boost socioeconomic growth.

5.1 Water Resource in North-East India:

There are plenty of water resources in the area. In Northeast India, the Brahmaputra and Barak rivers are the two biggest river basins. The Brahmaputra is one of the world's biggest rivers (5,80,000 sq km), with India receiving 33 percent of its flow. The river starts in the Kailas range of southern Tibet, at a height of 5,300 metres above sea level, from the glaciers of Chema-Yung-Dung. Arunachal Pradesh (41.88%), Assam (36.33%), West Bengal (6.47%), Meghalaya (6.10%), Nagaland (5.57%), and Sikkim (5.57%) are the states with the largest river basins in India (3.75 percent). China receives 50.5 percent of the river's entire

area, India gets 33.6 percent, Bhutan gets 8.1 percent, and Bangladesh gets 7.8 percent. The Barak River starts in Manipur, India, then flows through Bangladesh and Myanmar. The overall length of the river in India is 41,723 square kilometres. The river runs through the Indian states of Manipur, Assam, Meghalaya, Nagaland, Mizoram, and Tripura, which have a combined population of 6.2 million people. The upper Barak catchment area in Manipur encompasses the whole north, northwestern, western, and southwestern regions of the state. The river's main section runs in Cachar in southern Assam, while the lower deltaic section flows in Bangladesh. The Brahmaputra and Barak rivers are both vital lifelines for people wholive in their floodplains and rely on fishing and agriculture for their livelihood.

In terms of drinking water resources, North East India has the following situation.

Table-2: Drinking water sources in North-East India.

States	Population	Population Density	All sources	Hand pump
Arunachal Pradesh	13,82,611	17	1,95,723	24,134
Assam	3,11,69,272	397	53,74,553	28,66,428
Manipur	27,21,756	122	3,35,752	25,470
Meghalaya	29,64,007	132	4,22,197	14,598
Mizoram	10,01,014	52	1,04,874	
Nagaland	19,80,602	119	2,84,911	
Sikkim	6,07,688	86	92,370	
Tripura	36,71,032	350	6,07,779	

Source: Census of India, 2011

Prospects of Water Resource in North-East India:

The Northeast states have the capacity to produce 60,000 MW of

hydropower, but only 2004 MW is currently being used. With over 42.54 percent of the country's hydropower potential, the Northeast is the most promising area. However, it has only harnessed 3.02 percent of total capacity, compared to the national average of 23.53 percent. This potential may be shared with other parts of the nation if it is fully realized. It could also be used to supply electricity to remote hilly areas of these regions, as well as in the development of infrastructure, roads, and communications, among other things.

Table-3: Hydropower Potential Status in North eastern states till October, 2013

STATES	HYDROPOWERPOTENTIAL (MW)*	Capacity yet to be developed	
		MW	%
Arunachal Pradesh	50328	47213	93.82
Assam	680	305	44.85
Manipur	1784	1679	94.11
Meghalaya	2394	2072	86.54
Mizoram	2196	2136	97.26
Nagaland	1574	1499	95.23
Sikkim	4286	1295	30.23
Tripura	15	15	100

Source: Central Electricity Authority, Ministry of Power, 2013

The Northeast region's hydropower potential is significantly underutilized, and it will marginally grow to 4.84 percent after the current development is done. With a hydroelectric potential of 50, 328 MW, Arunachal Pradesh may be called India's "Power House," accounting for 33.84 percent of the country's hydroelectric capacity and 79.56 percent of the region. Arunachal Pradesh's government has signed

132 memorandums of understanding (MOU) with hydropower project developers fora total of 40,140.5 megawatts (MW) by 2013. There are 120 private firms out of the total. Sikkim has the second-largest hydroelectric potential, with 6.77 percent, while Meghalaya has the third-largest hydropower potential, with 3.78 percent of the region's overall potential.

On the other hand, the river network systems provide natural and centuries- old navigation routes that link the NER area. The Indian government has recently placed a fresh emphasis on restoring inland shipping, which is both cost-effective and environmentally benign. In addition to the current five national waterways (NWs), the National Rivers Act of 2016 designated 106 additional waterways as NWs. The Brahmaputra river, which runs 891 kilometres from Dhubri to Sadiya, and the Barak river, which runs 121 kilometres from Lakhipur in Assam's Cacher district to Bhanga, Karimganj, are two of the most significant rivers in the North eastern region (NER). These waterways have enormous potential for cost-effective commerce. Food grains, energy generation and transmission equipment, fertilisers, construction materials, and bamboo are among the most common cargoes delivered by NW-2 at the moment. Because there are no big businesses in the NER along the river bank, trade volume in NW-2 is small as compared to NW-1.

The NER of India offers a lot of potential for natural, cultural, and adventure tourism; there are also a lot of opportunities for religious travel between Nepal, Bhutan, Myanmar, and India, with a focus on Buddhist circuits in Bodhgaya (Bihar), Kushinagar (UP), and Lumbini (Nepal). There is also a lot of potential for nostalgia tourism on both sides of the border in Bangladesh, West Bengal, Assam, Tripura, and other places, as well as for war tourism in NER and its environs, especially for Japanese and Chinese tourists. Because tourism is linked to and strongly reliant on

local natural resources, culture, food, art, and history to attract visitors, the region's tourism prospects may lead to inclusive development. As a result, both local residents and foreign organisations will benefit from increased livelihood and economic prospects. In a nutshell, tourism has the potential to successfully link the BBIN sub- region with Myanmar, fostering people-to-people connections, trust, and economic success for everyone.

Problems of Water Resource in North-East India:

1. Flood Devastation: The basic reason that threatened the navigability of water ways in Assam is the neglect of maintenance of the waterways. The 1950‟s earthquake raised the problem of conservancy. The frequent flood causes tremendous rise of the river beds by depositing the rubbish carried from the upper reaches. Each year during the monsoon season, the Brahmaputra and Barak rivers, which are fed by more than 50 tributaries, generate massive flooding.

2. Havoc of Erosion: Another significant issues being encountered by the states of North East Region is erosion by the river Brahmaputra, Barak and other rivers. Bank erosion by the rivers has been a severe concern since previous six decades as more than 4.27 lakh hectares of land has already eroded away by the river Brahmaputra and its tributaries since 1950 which is 7.40 percent of area of the state. As anticipated the yearly average loss oflands roughly 8000 hectare. It badly influences the agricultural fields every year which lead to economic backwardness of the residents in river regions.

3. Drinking water shortage: Despite its abundance of water, North East India is water-scarce when it comes to drinking water. Water is scarce in the area, and many households and people do not have access to it.

Individuals' average income is low, suggesting a lack of capability to provide clean drinking water and sanitation inside the premises. Another challenge is the management of drinking water. According to the 2011 census, more than half of the households in Arunachal Pradesh, Assam, Manipur, Meghalaya, and Nagaland do not have access to improved sanitation facilities, posing serious health risks due to rising surface water pollution and geogenic contamination such as arsenic and fluoride in groundwater. The problem of water quality is also becoming more pressing.

4. Trans-boundary river Issues: There has already been a lot of uproar in the Northeast about water shortages. Annual flood disaster in the Assam valley, an unprecedented increase in hydropower building in Arunachal Pradesh, the possibility of Chinese water diversion upstream of the Brahmaputra, and a lack of potable water in cities and hill regions are just a few of the challenges. The northeastern area is bordered by foreign borders and connected to mainland India by the Siliguri corridor, which is 27 kilometres long. Many of the tributaries of the Brahmaputra and Barak rivers, two of the region's largest rivers, are international waterways. As a result, water-related conflicts in the area have a great deal of geopolitical significance. However, India's government is focusing on hydropower development and negotiating a water-sharing agreement with China at the moment.

LAND RESOURCE:

The North-Eastern region of India has a total area of 262180 km2, accountingfor nearly 8% of the country's total size. The land use pattern in India's north-eastern

area has evolved throughout time, and it is characterized by subsistence agriculture in different places. Forestry is the most common land use system, followed by agriculture, horticulture, animal husbandry, and non-agricultural uses including urbanisation, road building, and commercial development, among others. The following table shows the land use pattern and distribution among eight states in the North-East region:

Table 4: Remote sensing based land use pattern (2005-06) of North-eastern region of India.

NER	Arunachal Pradesh	Assam	Manipur	Meghalaya	Mizoram	Nagaland	Sikkim	Tripura
G. Area (M ha)	8.30	7.79	2.22	2.24	2.10	1.65	0.70	1.02
Land use (% of Geographicalarea)								
Cropland	2.93	37.27	7.78	8.93	4.41	11.53	9.78	17.63
Builtup	0.46	0.71	1.69	3.73	0.82	2.23	0.24	8.22
Grassland	6.41	5.53	6.66	0.84	16.48	0.14	7.64	4.57
*D. Forest	58.06	15.80	28.94	25.06	19.81	26.73	26.05	46.04
O. Forest	14.93	24.40	35.63	42.52	44.36	37.64	10.38	9.24
PH	0.02	0.16	0.01	0.05	0.40	0.42	0.33	5.88
SC	1.83	0.30	2.79	3.33	12.46	9.08	0.00	2.44
Snow	9.51	0.00	0.00	0.00	0.00	0.00	36.74	0.00
Wasteland	3.92	4.58	14.58	13.98	0.19	11.08	8.04	4.89
Waterland	1.94	11.25	1.92	1.56	1.08	1.15	0.79	1.09

*D Forest: Dense forest, O. Forest: Open forest, PH: Plantation and Horticulture,

SC: Shifting Cultivation (Source: NRSC, 2011) G. Area: Geographical Area; M ha: Mega Hectare.; NER: North Eastern Region (India)

The geography of the North Eastern region is inverted bowl-shaped in which the valley region is situated in the middle. The land use capability classification of valley region is somewhat favorable for cultivation whereas the land use capability classification puts the hilly regions are grossly unsuitable for any type of cultivation of crops (for maintaining the long term sustainability of land resources). However, dense forest area is below than the 40% in most of states excepting Arunachal Pradesh and Tripura. Except Sikkim and Tripura, all states have higher forest cover area. Land resources mean the resources available from the land. It includes natural resources for an example – gold, timber, coal, iron ore, uranium, oil, water, soil, air, plants, animals etc.

Prospects of Land Resources:

Efficient management of the finite natural resources of the region is the key to suitable and equitable development .This is particularly important for the Himalayan region which is the youngest and most fragile mountain ecosystem inthe world.

Improvement of shifting cultivation- The development and implementation of sustainable framing systems compatible with the socioeconomic aspirations and conditions of the local community could be helpful to reducing land degradation. Appropriate agro-forestry systems have the ability to prevent soil erosion by preserving soil organic content and physical features, among other things.

Watershed Development Project- For the avoidance of land degradation, reclamation of particular problem areas, and assuring land productivity, the Government of India has developed numerous center-sector, state-sector, and foreign-aided projects, all of which are executed on a watershed basis. The Watershed Development project, which has been handed to the state plan sector, has also begun in the whole NE Himalayan area. Watershed projects, such as the WDPSCA scheme, were implemented in the Northeast states to eliminate *„jhum"* agriculture in a sustainable manner, reducing land degradation.

Problems of Land Resource:

The most serious problem is the degradation of natural resources. Land degradation is characterised as a temporary or permanent reduction in the land's productive capability, as well as its productive potential, which includes its key land uses, agricultural methods, and economic worth. The causes of such deterioration include heavy rainfall, shifting farming, water erosion, and so on. It is impossible to quantify the population and area under shifting agriculture (jhum) in the region; even now, they are estimates that do not include land that has been degraded and then abundant by shifting farmers. The deterioration might be one of the causes of the destructive surface floods, flash floods, and landslides that have occurred over the country's north eastern area. In 2018, minor to moderate floods hit five states: Assam, Manipur, Tripura, Mizoram, and Nagaland. In addition, in these states, acidity is the most prevalent cause of soil deterioration. Because of the substantial rainfall it gets each year, the land in the northeast is naturally acidic, but the acidity will be exacerbated by climate change-induced increased frequency of heavy rainfall events. Acidification degrades the quality of soil and considerably diminishes its yield. Nagaland has the largest concentration of acidic terrain, accounting for almost 7.5 lakh hectares, or over 45 percent of the state's total land area. Manipur is in second place, with 6.3 lakh hectares of acidified land, accounting for more than 28% of the state's total land area. Only in Arunachal Pradesh and Assam is the damage caused by

water erosion larger than the deterioration caused by acidity.

Another problem is water logging, which happens when soil becomes saturated with water due to a variety of factors such as excess irrigation, seepage from canals, insufficient drainage, or the existence of a hard pan underneath. Under soggy circumstances, land cannot be utilised for cultivation or human settlements. Salinity and alkalinity result from water-logging in dry places.
There is a limited amount of land available. It is essential for all development operations, natural resources, ecological services, and agricultural production. Growing population, expanding requirements and demands for economic growth, food and other goods derived from natural resources, as well as land degradation, are putting increasing strains on land resources. As a result, the most efficient use of land resources is required. However, in the domain of land use, thereis presently no one method being followed in the N-E areas, as well as throughout the nation.

Forest Resource in North East India:

A huge number of hills and plains, particularly in India's North Eastern area, are reliant on forest resources. If correctly managed, it may be a renewable resource. It is both a biodiversity hotspot and a mega biodiversity centre. According to an official estimate based on satellite data, the NE area contains 1,63,799 square kilometres of forest, accounting for nearly 25% of the country's total forest cover. More than a third of the country's entire biodiversity is found in this area, which is also a global biodiversity hotspot. It covers 7.7% of India's totalland area and is home to 50% of the country's flora, with 31.58 percent of it being indigenous.

The North East area is rich in natural resources, including orchids,

important medicinal and decorative plants, vegetables and fruits, and valuable trees such as Sal, Teak, Champu, Sishu, Neem, Agaru, Halokh, Sarol, Bamboo, Cane, Simul, and Gamari. Animals abound in North East India, as well as a plethora of birds. Rhinoceros, Golden Langur, Wild Buffalo, Elephants, Hoolock gibbon, Crapped langur, Musk deer, Bear, Wild boar, Royal Bengal Tiger, Barking Beer, Bison, Civet cats, Wild cats, Snow leopard, Monitors, lizards, Python, Cobra, Tortoise, Turtle, Peacock, Storck, Vulture, Eagle, Parrots, Doves, Ducks, Pelican, Python, Cobra The Kaziranga National Park, in Assam, is known for its one-horned rhinoceros. In 1985, the Kaziranga National Park was designated by UNESCO as a World Heritage Site. Based on the abundant resources, the residents of the area built small scale enterprises such as plywood mills, paper and pulp mills, raw mills, and a match production facility. Tea, rubber, silk, tobacco, bamboo, and fruits like as pineapple, orange, and mango are all produced in the North East region's forests.

The geographical and forest areas of North Eastern India are described in the tablebelow.

Table-5: Geographical and forest area in North-East India

States	Geographical area km^2 (1997)	Forest cover in 2001	Forest cover (%) in 2001	Forest cover in 2011	Forest cover change (2001-2011)

Arunachal Pradesh	84743	68045	80.20	67410	-635
Assam	78438	27714	35.3	27673	-41
Manipur	22327	16926	75.8	17090	164
Meghalaya	22429	15584	69.4	17275	1691
Mizoram	21081	15584	82.9	19117	1623
Nagaland	16579	17494	80.4	13318	-27
Tripura	10486	7065	67.3	7977	912
Sikkim	7069	3193	45.1	3359	166
Total	2,63,152	1,69,366	64.3	1,73,219	3853

Source: Forest Survey of India

Prospects of Forest Resources in North-East India:

i. **Tourism Industry:** The wildlife sanctuaries of North-East attract the tourists all over the world. Based on the charming forests of the NER, a developed tourism industry may rise up. The tourism sector is a growing sector in the north east which possesses great potentials of collecting revenues for the states.

ii. **Potential in Medicinal Industries:** Exploration for forest-based plant products for new pharmaceuticals and the demand for medicinal plants are increasing in both developing and developed countries especially among the youth. Surprisingly, the bulk of the traded material is still from the wild and a very small number of species are cultivated. According to the data compiled by the International Trade Centre, Geneva, India is ranked second amongst the exporting countries, after China. North East Region of India with 2000 estimated number of medicinal plants is at the top places among medicinal plant abundant regions of India. With proper care and maintenance, if the medicinal herbs are grown, this will uplift the North east economy. Moreover, there is enough potential to establish herbal medicinal

research units in North East India. Again, scientific approach for their exploration, utilization, conservation and value addition may be the key points for entrepreneurship development by exploiting the indigenous technology knowledge.

iii. **Bamboo Industry:** Bamboo is one of the most plentiful, environmentally benign, and long-term resources accessible in the North East Region, yet it is underutilised. The state of Arunachal Pradesh has the most dense bamboos, followed by Mizoram and Manipur. Mizoram, which is followed by Meghalaya, has the most forest area covered with various bamboo species. Because this area has India's greatest bamboo resource, screening is necessary to select the most fragile bamboo species and build a package of procedures for mass replication. Tripura, Assam, Mizoram, and Nagaland are four Northeastern states that have developed their unique strategies for bamboo growth and forest protection.

This potential resource is used by tribal tribes in the area for food, housing, furniture, handicrafts, medicines, and a variety of ethno-religious purposes. Bamboo working is a relatively prevalent skill, with a large percentage of ethnic groups capable of excellent craftsmanship with this material. This potential resource is used by tribal tribes in the area for food, housing, furniture, handicrafts, medicines, and a variety of ethno-religious purposes. Bamboo working is a very common ability, with a big portion of the ethnic people capable of great workmanship with this material. The different Northeastern tribes' workmanship gives the most imaginative expression to the North East's thriving bamboo craft legacy. The many varieties of bamboo crafts created by these craftsmen demonstrate intricate

structures and a wide range of cuts and profiles done with different sorts of chisels. Trays, one-of-a-kind furniture, bamboo and cane mats, colourful lamp shades, stools, hand fans, baskets, hand bags, jewelries, and other products are among the goods they create. This location has the potential to increase worldwide bamboo shoot exports to European nations, both steamed and canned. All of them are labor-intensive sectors with a high potential for employment in emerging countries. As a result, the bamboo sector in the North Eastern States has the potential to become a significant employment.

iv. **Herbal Fragrance and Cosmetic Industry:** Like medicinal herbs, North east India is abundant with numbers of plants which are dominantly used for Perfume and Cosmetic Industry.

North East can reproduce fragrance raw materials which have great demand in world. Considering its close linkages with grass root economies, it can reboot Indian economy from ground level.

Problems of Forest Resources in North-East India:

i. **Deforestation**: Deforestation is a big issue in India's north-eastern provinces. Deforestation may occur as a result of rising population and the desire for greater living space. The issue develops as a result of uncontrolled tree cutting to feed the ever-increasing appetite of companies that rely on forest products such as paper and pulp, plywood, match sticks, and other similar items. Climate change, desertification, and soil erosion are all possible outcomes of the loss of trees and other plants. Global warming is exacerbated by deforestation. It increases the amount of carbon dioxide in the atmosphere to increase. It has the potential to cause global warming, which is referred to as the greenhouse effect.

ii. **Illegal Poaching of Animal**: Another problem arises in the North East region is illegal poaching of animals like one horned rhino, elephants, tigerand deer etc. Due to heavy hunting for meat and nails, most of the birds are on the verge of extinction such as Forest owl, Ducks and migratory birds etc. Hunting of wild animals and the trade of animal parts banned in India but there are number of wild animals being poached in international black market.

iii. **Conversion of forest land in agricultural land:** Due to rising population and resulting food scarcity on restricted agricultural land, forest area is being cultivated so that agricultural productivity may be significantly enhanced and food may be delivered to the world's hungry people.

iv. **Shifting or 'jhuming' cultivation**: In north-east India, shifting agriculture is a significant source of forest loss. Forest cover loss due to shifting agriculture is growing year after year. Animal overgrazing of forest with moderate cover has resulted in large-scale deterioration of natural vegetation, if not full forest loss. Grazing animals have had the greatest impact on deforested regions, since big herds of grazing animals have prevented new plant regrowth.

v. **Lumbering:** The true cause of large-scale forest loss is timber harvesting for residential and commercial needs. The ever-increasing need for lumber for different uses as a result of industrial development, urbanisation, and a fast growing human population has wreaked havoc on natural forest covering.

Human Resources:

Human Resource indicates those people who have a high level of knowledge, ability, experience and willingness to perform a particular work. The human resources indicate the

active age group people who can economically contribute in their country. The human resources have better knowledge, skill, efficiency, experience to perform the work. Pioneering economist John R. Commons used the term "human resource" in his 1893 book „The Distribution of Wealth", but did not further build upon it. Keeping aside the conceptual dilemma, the main rationale dwells inherently in the process of human resource development (HRD). The NER Vision 2020 has identified that "in any people-centric vision of NER, education and the building of skills and knowledge will be the cornerstone. This is the only capital that people without land and financial capital can acquire to enhance their income streams and improve their living conditions. In the development process, education is vital to growth across all sectors."

In this paper, literacy rate and Human Development Index of the North Eastern statesare used as a tool for revealing the status and trend of human resource development in the region.

Table-6 : Trend of Literacy Rate in North East India:

STATE	1991	2001	2011
Arunachal Pradesh	41.59	54.34	66.95
Assam	52.89	63.25	73.18
Manipur	59.89	70.50	79.85
Meghalaya	49.10	62.56	75.48
Mizoram	82.26	88.80	91.58
Nagaland	61.65	66.59	80.11
Sikkim	56.94	68.81	82.20
Tripura	60.44	73.19	87.75

Source: Census of India, 2011.

Literacy rate in India is uneven and as such, different states of NER also have differences in literacy rate. The literacy rate of NER is at an increasing trend. Let"s consider the 2011 Census. The literacy rate of India (as a whole) in 2011 is 74.0 percent. In comparison to the national context, only Arunachal Pradesh is a little below from national rate. Mizoram and Tripura are showing a tremendous uplift occupying the third and fourth rank after Kerala (Rank-1) and Lakshadweep (Rank-2) among the states/union territories.

Table-7: Gross Enrollment Rate (2015-16):

STATE	SECONDARY	HIGHER EDUCATION
Arunachal Pradesh	89.63	28.7
Assam	77.59	15.4
Manipur	93.07	34.2
Meghalaya	87.27	20.8
Mizoram	109.02	24.1
Nagaland	71.62	14.9
Sikkim	119.78	37.6
Tripura	118.49	16.9

Source: National Institute of Educational Planning, New Delhi.

In comparison to Secondary Education, the GER in higher education is much lesser. Again, in caparison to other higher GER states like Chandigarh, Delhi etc, the GER of the north

eastern states are far below, except Manipur and Sikkim. But it is notable that, in case of primary education, the GER of north eastern states have been showing a very good status likely equivalent and more than those advanced states.

Table-8: Trend of Human Development Index:

STATES	2000	2015	2018	Nature of HDI* (in 2018)
Arunachal Pradesh	0.502	0.661	0.660	MHD
Assam	0.488	0.598	0.614	MHD
Manipur	0.579	0.694	0.696	MHD
Meghalaya	0.477	0.648	0.656	MHD
Mizoram	0.569	0.698	0.705	HHD
Nagaland	0.522	0.679	0.679	MHD
Sikkim	0.548	0.691	0.716	HHD
Tripura	0.531	0.643	0.658	MHD

Source: UNDP Reports. [* - denotes High Human Development(HHD), Medium Human Development(MHD)]

Making a comparative analysis, it is worth concluded that all the north eastern states, except Assam, are all above the national average (0.647). If aggregate value of HDIs of all thenorth eastern states is taken, the average of NER (0.673) places itself higher than the national context.

Problems in Human resource Development:

1. **Systematic Errors in Education:** In North East India, education system is not in a good position in real term. It is doing better in some quantitative aspect, but talent base education is far lower in comparison to some advanced states like Maharastra, New Delhi etc. The education system has been run in a traditional way which is imperfectto improve the human resources.
2. **Problem in Human Resource Management:** There is a huge gap between planning and implementation which leads to either over-spending or under-spending of the funds allocated. For that, various government schemes for skill development are not

running at an efficient speed. This typically leads lack of motivation among the people (especially youth) of the region.

3. **Technological gap: The technological development of these regions has been squarely based on adoption and imitation rather than innovation**. Imitation is easier than innovation. Due to rapid adoption of technology, many problems like loss of job, lack of efficiency and equity may occur.
4. **Lack of mental support:** It is one of the main inherent causes in human resource development. Many students have been committing suicide due to this very reason. Tripura and Mizoram are at the top ranks in youth suicide (*NCRB Data*). This creates problems in human resource development of the region.
5. **Other economic Issues**: Infrastructural issues, poor transportation facilities, global competition, lack of capital formation, lack of sufficient health care facilities corruption issue etc are some other bottlenecks in human resource development in NER.

Prospects in Human Development in North East India:

1. **Initiatives taken by HRD Ministry:** Various initiatives are taken by the HRD Ministry of India to support the human resources to develop. Some of them are like *Beti Bachao Beti Padhao Abhiyan, UDDAN, Swami Vivekananda Single Girl Child Scholarship, Ishan Uday, Ishan Vikas, SWAYAM, Dr. S. Radhakrishnan PostDoctoral Fellows in Social Sciences*, etc. In post „digital-India" period, the peopleof North East India are taking the benefits of these schemes in a quite good manner. It indicates the growing scope in the development of human resources.
2. **Advantage from tourism, film, sports industry:** North east India possesses bounteous prospects in developing human resources in the cited aspects. To-day, NER, specifically Assam, is a „star-hub" of India. Many stars from films and sports

have been encouraging those skills among the youths of NER. NEUFC is an example of it.

3. **Convergence Point of SAARC and ASEAN**: Of the six international borders that India shares with its neighbours, the north east region shares borders will all except Pakistan. The NER lies in the convergence point between SAARC and ASEAN. That is, where SAARC ends, and ASEAN begins, and therefore the strategic and topographic importance of the region is significant. The Act East Policy when acted upon has to have its centre of activity in North Eastern Region only. This economic hub will cater to and impact more than 40% of the global population. North East India will not just be an economic centre or trade junction between India, China, Nepal, Bhutan and ASEAN countries but also have the potential to generate additional revenue by exporting power to its power starved neighbours, given its tremendous hydroelectric potential. If the youths of the NER are made skillfully efficient for these activities, the development of NER will may definitely have a great scope to prosper.

6. CONCLUSION:

From the analysis done above, there is no doubt about that North East India is full of resources. It is of a great potential region to be self reliant in economic perspectives. Yet many challenges have been capturing it for decades. Central Government of India along with State Governments has done many for the uplift of the region. But they are not enough, more actions have to be performed by the Governments. Efficiency and equity may be a noted concern.

6. REFERENCES:

1. Mahongnao, M., Noklyenyangla & Kumar, S.(2017). Natural Resources and Socio-Economic Development in North East India. *Journal of North East India Studies, 7*(2), 84-99.

2. Singh, R., Srivastava, R., & Mukherjee, T. (2009). MEETING REPORT: Community-based sustainable natural resources management and development in Northeast India. *Current Science, 96*(1), 19-21. Retrieved from http://www.jstor.org/stable/24104718

3. Rai, S.C. Traditional ecological knowledge and community-based natural resource management in northeast India. *J. Mt. Sci.* **4,** 248–258 (2007).
https://doi.org/10.1007/s11629-007-0248-4

4. P.S. Ramakrishnan, Traditional forest knowledge and sustainable forestry: A north- east India perspective, Forest Ecology and Management, Volume 249, Issues 1–2, 2007, Pages 91-99, https://doi.org/10.1016/j.foreco.2007.04.001.
https://www.sciencedirect.com/science/article/pii/S0378112707003088

5. P. Nayak. (2010) Growth and Human Development in North East India, Oxford University Press, New Delhi, pp.151-164.
https://www.researchgate.net/profile/Purusottam-Nayak/publication/277036532_Human_Development_in_North_East_India/links/5a084251a6fdcc65eab4fc43/Human-Development-in-North-East-India.pdf

6. De, L.C., Singh, D.R. (2017).Natural Resources in North East Region of India. *International Journal of Agricultural Science and Research, 7*(5),51-66. https://www.researchgate.net/publication/335443259_NATURAL_RESOURCES_IN_NORT

H_EAST_REGION_OF_INDIA/link/5d662e77299bf1f70b124fae/download

7. Sustainable Development Department Environment & Water Resource Management Unit. (2007). Development and Growth in Northeast India; The Natural Resources, Water, and Environment Nexus. Report No. 36397-IN. http://www.indiaenvironmentportal.org.in/files/4_0.pdf

8. Mishra, S.K. (2003). Issues and Problems in Human Resource Development in NER. *Munish Personal RePEc Archive.*

9. H, Shivananda. (2011). Economic Potential of Northeast India: An Asset or Threat?*Journal of Defence Studies, Manohar Parrika rInstitute for Defence Studies and Analysis.*

10. Handique, K & Dutta, A. (2012). Power of North East: The Hydro Power Scenario of North East. *International Journal of Science and Research*. http://www.ijsr.net/archive/v3i12/U1VCMTQ0MDM%3D.pdf.

11. Singh, A.K. (2013). Land Resource Management in North Eastern Himalayas.http://www.researchgate.net/publication/281772

12. Chakravarty, S., Suresh, C. P., Shukla, G. (2012). North East India, The GeographicalGateway of India‟s Phytodiversity. *Indian Forester*, *138*(8), 702-709.

13. Statistical Handbooks of the North Eastern states of India of different years.

14. Census of India, 2011

15. Various reports of Central Electricity Authority, Ministry of Power, India, 2013.

16. National Remote Sensing Centre, India data, 2011.

17. Forest Survey of India of different years.

18. NER Vision 2020. http://necouncil.gov.in/about-us/nec-vision-2020-0