

**ECONOMICS OF FOREST RESOURCES WITH SPECIAL REFERENCE TO ASSAM**

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**Abstract**

Assam being located in the north-eastern part of India is covered with different types of vegetation and thus becomes one of the most important biodiversity hotspot zones in the country. Like the other states of the region, Assam also supports abundance growth of forest resources owing to her congenial physical and environmental conditions. Ever since people started inhabiting in the state, people have utilized the forest resources for their daily uses which help them in sustaining their livelihood in either way. Even, various forest-based industries have grown up in the state generating employment facilities. Thus, the forests have greater economic significance in the state which helps in generating revenue both for the people and the government. However, because of greater economic benefits, the excessive use of forest resources has started in the state. On the other hand, the rapid growth of population and increase in their settlements, extensions of agricultural and other constructional activities have resulted in the rapid depletion of forest cover. Meanwhile, forest cover loss has become another serious problem causing several problems like loss of habitats of different plant and animal species, erratic rainfall, accelerates soil erosion, and global warming. This paper, therefore, attempts to study the role of forests in the economic development of the people and the state of Assam as a whole. The study is based on secondary data and information collected from various secondary sources.

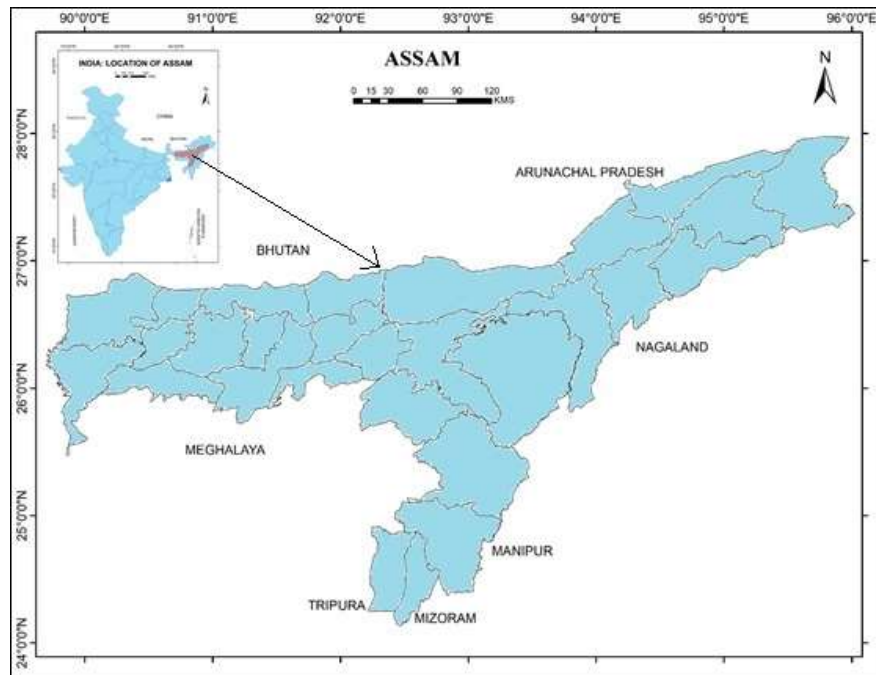
**Introduction**

Assam, being located in the sub-tropical monsoon region favors suitable conditions for the growth of vegetation (Taher and Ahmed, 2005). Therefore, the state is very rich in forest resources owing to its congenial climatic, geomorphic, pedological and hydrological conditions

(Bhattacharya, 2005). Therefore, since the inception of human settlements in the state, there has been a close relationship between humans and forests as people were largely dependent on the forest resources to meet their daily needs. However, there has been increasing population pressure on the forests because of rapid growth in human population and the concomitant increase in their settlements. At present, the forest cover of the state stands at less than 20% of the total area of the state. Noteworthy that, forests are one of the major parts of the natural landscape (Sarma, 2001). Often called the lungs of the earth, they have been providing livelihoods to the humans and habitats for the animals. They provide multiple benefits and play an important role in the economic development of a region. In fact, they are the sources of raw materials for various construction activities and industries like paper, plywood, match, etc. Thus, a large number of forest-based industries have developed across the state thereby helping in the generation of employment facilities. Besides, they also provide habitats to a number of wildlife species prevent soil erosion and help in recharging groundwater. This paper, therefore, attempts to examine the importance of forests in the economic development of Assam and the scenario of forest cover loss.

## **Study Area**

The present study encompasses the state of Assam, having latitudinal extension from 24.3° N to 28° N and her longitudinal extension is from 89.5° E to 96.1° E (**Fig 1**). She has a total area of 78,438 sq. km with a total population of 31,169,272 (2011). Though the state is surrounded by hills and mountains on its three sides, more than 70% of the state is covered by plains.



**Fig 1: Location map of Assam**

### **Database and Methodology**

The present study has been carried out to analyze the economic characteristics of the forests using the relevant data and information collected from different secondary sources like Economic Survey of Assam, 2017-2018, Statistical Handbook Assam, 2018, the Office of the Principal Chief Conservator of Forest, Assam, journals, periodicals, and other relevant books. However, for accessing data and information on the income generated from forests, forest-based industries and utilization of forest resources, various books on Assam have been reviewed.

Data collected from different sources have been systematically arranged and in order to compile, analyze them qualitative and cartographic techniques have been employed. Some meaningful cartographic techniques were incorporated in the paper using Microsoft Excel, Google Earth Pro, ArcGIS 10.2.1 for processing and representing the data so obtained in the form of tables, and diagrams.

### **Forests and Revenue Generation**

Forests have always been beneficial to man in one way or the other. The use of forest resources for firewood and timber for construction activities is a very age-old activity. On the other hand, minor forest products like sand, gravels/stone, silt/clay, etc. are also widely used by people located in the vicinity of the forests (Table 1).

**Table 1: Production and out-turn of forest products in Assam**

<b>Year</b> <b>Forest</b> <b>Produces</b>	<b>2010</b>	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>
Timber	34142	78629	14074.53	24546.48
Fuel wood	1289	3469	15151.47	10410.41
Sands	2470587	4775406	338604.69	527010.69
Gravel/stone	1979815	8587090	806423.47	1542003.04
Silt/clay	1730252	1186372	1986018.72	3734861.05
Others	-	128988	22604.30	201120.86
Total	6579400	2651610	3182877.18	6039952.53

Source: Office of the Principal Chief Conservator of Forest, Assam

Thus, a good amount of revenue is earned by the state Government from its various forest products. In the year 2018, the department has earned 14872.00 lakh as revenue from the forest products which is 2021.24 lakh higher than the previous year. The amount of revenue earned from different forest products during the last few years are shown below (Table 2).

**Table 2: Revenue earned from different forest resources**

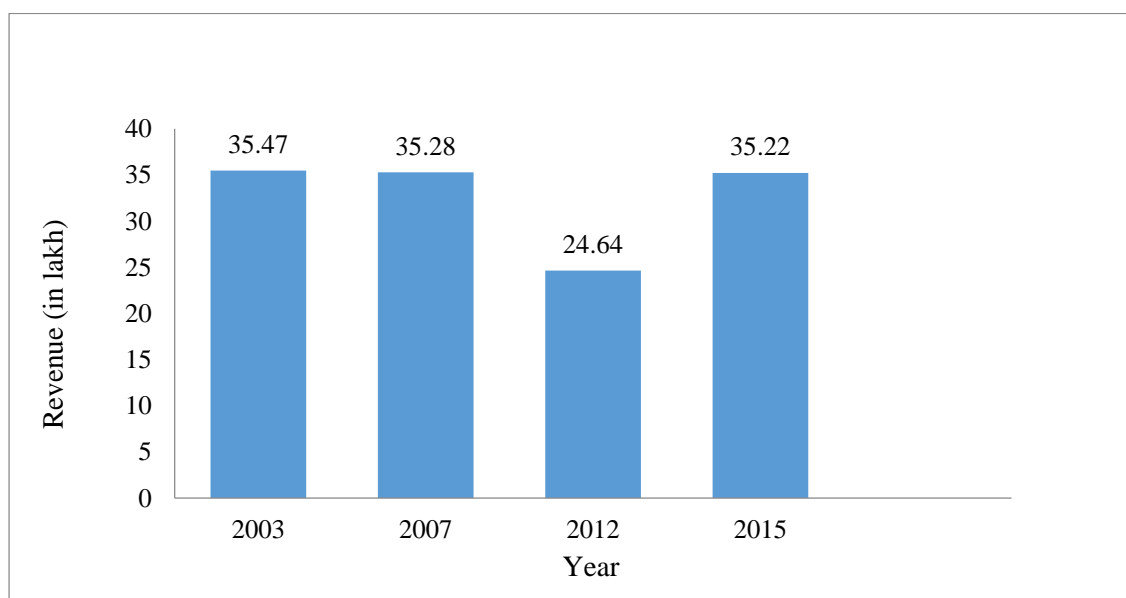
<b>Items</b>	<b>Revenue earned (Rs in lakh)</b>			
	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
Timber	170.16	164.99	385.07	422
Fuel wood	9.51	6.90	-	3.00
Sands	3671.73	4601.60	9728.77	9491.00
Gravel/stone				
Silt/clay	363.40	19.86	-	-
Others	-	704.00	2736.92	4956.00

Total	4215.17	5497.35	12850.76	14872.00
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Source: Statistical handbook Assam, 2018, Economic Survey of Assam 2017-18

It is seen that the forests resources have been using by the people for a variety of purposes. The use of timber and fuelwood is still not decreasing at this age of iron and steel because rural people are much dependent on the forest resources for their day to day activities.

**Fig 2: Trend of revenue earned from the forest products in the state (2001-2018)**



Source: Economic Survey of Assam, 2012-13 & 2017-18, Statistical Handbook of Assam, 2018.

The above diagram shows that during the year 2017-18 revenue earned is higher in the state while the year 2001-02 recording the lowest revenue from the forest products.

### **Forest-Based Industries**

It should be mentioned here that a large proportion of the forest resource is processed by a number of forest-based industries in various parts of the state. Depending upon forest resource, different kinds of industries like plywood factories, match factories, timber treatment, bamboo industries, etc. have grown up. Here it also can be mentioned that these industries are not only

utilizing forest resources but also providing employment opportunities to a large section of the people in Assam.

Some of the economically very important plants (*bamboo, agaru, sal, neem, champa*, etc.) are found in the region. In the case of bamboo and plywood industry, it is seen that Assam has the highest concentration of bamboos having a high potential for commercialization. The region has approximately 60% of the total bamboos of the country. The major industrial use of bamboo in the state is for paper manufacturing. The two paper mills- Hindustan Paper Corporation Ltd. located at Panchgram and the other one at Jagiroad received one million tonnes of bamboo annually. But due to scarcity of bamboo, both the paper mills are currently operating only at 41% of its installed capacity. So it may be mentioned here that if there is the availability of bamboos in the state then it would be near about 90-100% of its installed capacity instead of 41%. Besides, bamboo and cane furniture of Assam is world-famous but due to their over-exploitation, this industry has become almost extinct. It is because of this, the Government of Assam has given thrust to promote and support the integrated development of the bamboo and cane sector of the state. In this backdrop, the Government of Assam has taken necessary initiative to set up the bamboo park at Jagiroad which is 65 km from Guwahati covering an area of 176000 hectares.

Adding to it, the plywood industry is another important forest-based industries of Assam. The plywood industry is now the second largest industry in the private sector of Assam after the tea industry. Plywood is made by pasting several, very thin layers of wood one above another. It is mostly used in the manufacture of tea chests, boxes, furniture, panels, boards, flush doors, bodies of vehicles and railway compartment, etc. Assam produces about 65% of the total national production of plywood. Plywood industry plays an important role in the economy of the state. It is found that about 25,000 persons are directly or indirectly involved in the plywood mills of Assam. Both the State and Central Governments collect several crores of rupees as excise and other taxes from this industry. Further, the Assam Government collects about 1.5 crore rupees as forest royalty from these mills and India earns more than a crore of rupees in foreign exchange out of this production. Agarú becomes a rare plant now. It contains a very valuable essence from which

precious perfumes and some kind of drugs are prepared. Neem trees available in the state is one of the very important medicinal plants. On the other hand, Champa also provides an essence used as perfume. Besides these, there are a large number of trees and plants which enhance the economy of the state by providing scope for the forest-based industries to grow.

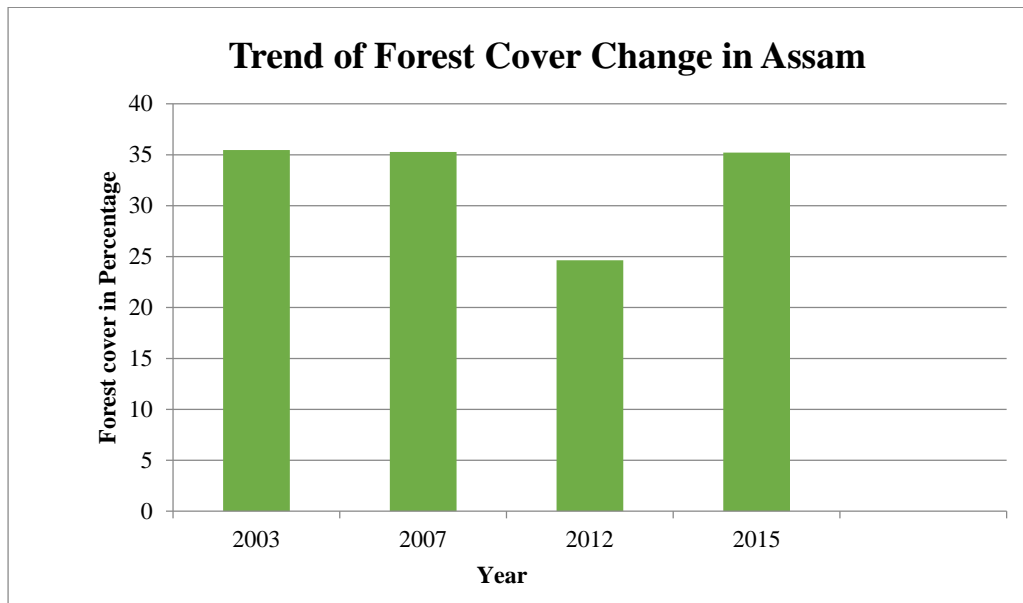
### **Depletion of forest resources**

Forest cover loss has now become a global problem because it adds to various climatic anomalies like erratic rainfall (Bennet and Barton, 2018), fluctuating temperature conditions (Pawar and Rothkar, 2015), soil erosion (Karamage *et al.*, 2016), loss of habitats for different species of plants and animals (Estavillo *et al.*, 2013), and most importantly it accelerates the process of global warming (Longobardi *et al.*, 2016; Abera *et al.*, 2018). Like other parts of the world, Assam is also facing this serious issue of forest cover depletion which is continuing at an alarming rate. Though there are manifold reasons for forest cover loss in the state, the major cause behind this problem is the rapid growth of the human population with a concomitant increase in the number of settlements. However, the extension of agricultural fields and other constructional activities by clearing forests are other reasons for forest cover loss in the state. The following table shows the trend of forest changes during the period (2003-2012).

**Table 3: Changes in forest cover**

<b>Year</b>	<b>2003</b>	<b>2007</b>	<b>2012</b>	<b>2015</b>
<b>Forest cover (in %)</b>	35.47	35.28	24.64	35.22

Source: Annual Report, 2010-11, Ministry of Environment and Forests, Statistical Handbook, Assam, 2012, Economic Survey of Assam, 2018



**Fig 3: Forest cover change in Assam**

It has been seen that the rates of forest cover loss were higher in 2002-03 and 2006-07, because after that the government, NGOs and other concerned officials started strictly monitoring these activities. On the other hand, the forest conservation policies in the state were strictly implemented so that the forest cover can be restored by the process of afforestation. Thus, the rate of forest cover loss has decreased in 2011-12. It is important to mention that with an increase in forest cover in the state, there is an obvious increase in forests resources and vice-versa.

### **Conclusion**

The foregoing study reveals that forest resources play a vital role in the economy of the state of Assam. Noteworthy that, Assam holds immense potential for the growth of forest-based industries by using forest resources. However, it should be kept in mind that while using the forest resources that they should be used with proper plan and care so that it does not harm the environment on the other hand. Efforts should be made to plant trees so that the process of afforestation balances the global problem of forest cover loss. Afforestation will also help in the

restoration and conservation of many endangered plant and animal species which are important natural assets of the state. It should be mentioned here that, apart from the Government of Assam, the active participation of the local people is a must to conserve the forest resources because unless they are aware of it, they will be extracting more and more without any future plan and policies. In this way, the entire ecosystem will be at some sort of balance which will help in the sustainable function of the forest ecosystem.

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