

# Non-Timber Forest Products (NTFPs) and their Role in Livelihood Economy of the Tribal People in Upper Brahmaputra Valley, Assam, India

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## Research Article

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### ABSTRACT

Non-timber forest products (NTFPs) play a crucial role in development and livelihood of tribal people across the world. In earth more than two billion people are dwelling in the forest, depending on NTFPs for subsistence income and livelihood. NTFPs are considered to be important for sustaining rural livelihoods, reducing rural poverty, biodiversity conservation and improving rural economic growth. The present study has the objectives of documenting the knowledge pertaining to the NTFPs and its used pattern in the livelihood of the tribal people in upper Brahmaputra valley of Assam, India. The Present paper summarizes the use of 47 plant species belonging to 31 families in various activities of day to day life of different tribal communities of upper Brahmaputra valley region.

## INTRODUCTION

Assam is one of the eight states of north-east, India having great cultural as well as both floral and faunal biodiversity. This state is located between 24°44'N to 27°04'N Latitude and 89°04'E to 96°00'E Longitude, covering 2.4% of the geographical area of the country i.e.78,538 sq km. The annual rainfall ranges between 305 cm. max to 178 cm min. with an average of 211.76 cm. The temperature recorded in summer is 37 °C maximum and 18 °C minimum, and 26 °C max. and 7 °C min. in winter. The average humidity is 83.00%. The forest area of Assam is 28,748 sq.km. out of which 359 sq.km. come under water bodies and the total forest area covers around 32% of the total geographical area of the state. On the other hand, forest and tree cover is 36.67% of geographical areas including homestead forestland. Out of the total forest area, 3555 sq.km. are under various types of encroachment <sup>[1]</sup>. Assam is a region of diverse cultures and traditions, races, and ethnicities. The folk culture is still vital in this region. Most tribal communities still largely depend on non-timber forest products for their traditional system of medicine, household material, cultural need etc. Because of their scattered and far-flung settlements and problems arising due to transportation and communication, traditional medicine has remained as the most affordable and easily accessible source of treatment <sup>[2]</sup>.

The NTFPs are the products of forest which include valuable food, fodder, fiber, medicinal plants, bamboos and canes, tannins and dyes, oils, gums, resins and leaves and many products of animal origin. Forest contributes to the environment climate, conservation of soil and regulation of water supplies, control of draughts and floods, improvement of landscapes, recreation etc. <sup>[3]</sup>. The NTFPs are an important source of income for the poor in many countries. In India, 50 million people are dependent on NTFPs for their subsistence and cash income <sup>[4]</sup>. The use of Non-Timber forest products is an age-old practice of human beings. In the upgradation of rural economics, the role and contribution of NTFPs are crucial because of their richness in biodiversity as source of food, fodder, fiber, fertilizers, herbal products, construction materials, cosmetics and cultural products of perfumes, medicines, paints etc. <sup>[5-8]</sup>. About 80% of the populations of the developing countries depend on NTFPs for their primary health and special nutritional needs. These are the direct benefits of forest. There are also some indirect benefits of forest as it protects

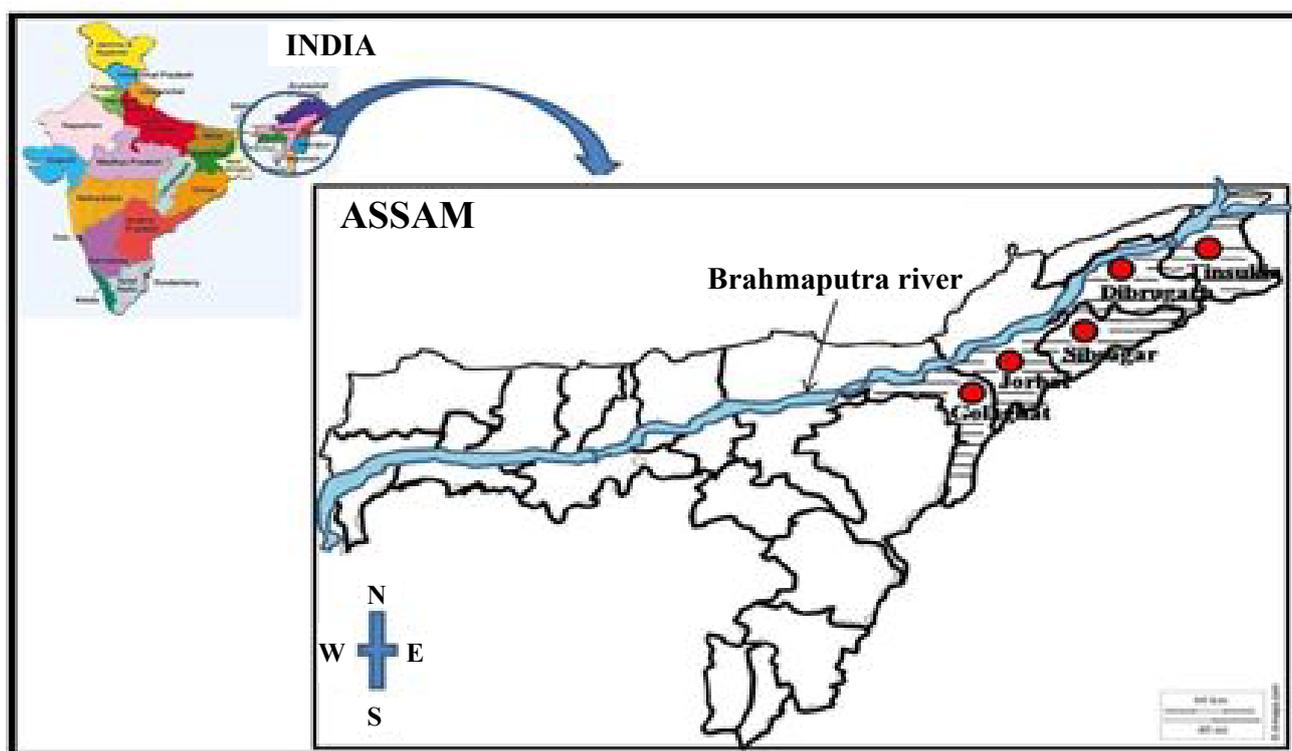
the environment and trees maintain the fertility of the soil in many ways. They maintain a symbiotic relationship between the fungi and a higher plant root and also prevent soil erosion. It also contributes to reducing greenhouse gasses and associated global temperature rise by converting into carbohydrate through photosynthesis.

The non-timber forest products are also called minor forest products because they have minor significance. These are categorized as edible products, grasses and grazing, fodder trees and shrubs, bamboo and canes, fibers and flosses, animal products, leaves, miscellaneous products etc. Gathering NTFPs from the local forest for getting cash income or used by indigenous people can be traced back thousands of years ago<sup>[9]</sup>. Forest is an inseparable part of the tribal people. They are almost completely dependent on forest for food, shelter, medicine and clothing. They collect NTFPs like roots, tubers, flowers, fruits, fibers, gums, resins, dyes, tannins, honey and wax etc. to fulfill their day to day requirements. A little work has been carried out for the tribal people regarding upliftment of their economic status through the selling of NTFPs.

The present study attempts to document on the diversity and usage pattern of NTFPs among the different tribal groups of Upper Brahmaputra valley, Assam, India. This Paper also helps to understand the role of NTFPs in livelihood and economy of the tribal people in the study area.

## MATERIALS AND METHODS

The study was carried out in the Upper Brahmaputra Valley Agro-Climatic Region of Assam. This region is consisting of four districts namely Golaghat, Jorhat, Sibsagar, Dibrugarh and Tinsukia covering an area of 12,692 square km. (**Figure 1**). The region is bounded by hills and Brahmaputra River which flows down gradually from the hills of Arunachal Pradesh and Nagaland. Soil is mostly alluvial and having the characteristic of deciduous tree, evergreen and semi-evergreen forest. The climatic condition of the region is damp and cool with annual rainfall more than 2600 mm. It is one of the most important tea growing areas of the world. The region is also showing both cultural and socioeconomic diversity with various indigenous ethnic/tribal communities. The major ethnic groups of this region are Tai-Ahom, Sutiya, Sonowal kachari, Muttock, Mishing, Moran, Deori, Tea tribes (Adivasi) etc. Moreover, many minority communities like Taiphake, Khamti, Turung, Aiton, Tiwa, Konayak, Singpho, Nocte etc. are also part of the socio-economic and cultural diversity of this region. All these indigenous groups of people of these regions have their own unique culture and tradition where they use different plant resources for their livelihood in their day to day life for different purposes. In the present study extensive field survey was conducted during 2014-2015 in the above mentioned region. The detailed household surveys were done using semi-structured questionnaire regarding the used pattern of NTFPs. From each selected village 30% households were sampled randomly. Further detailed information on NTFPs, plant species and their utilization patterns were collected through personal interview and group discussion with village headman and other knowledgeable villagers of different ages, groups and sex. The villagers were asked that what plant species were used as NTFPs, in what purposes and how they used them etc. Authentic identification was done with the help of different flora and monograph<sup>[10,11]</sup>. The collected specimens were preserved as herbarium and voucher specimens were kept in the department of Botany, D.R. College, Golaghat, Assam.



**Figure 1.** Map of the study site (▨ Shaded area).

RESULT AND DISCUSSION

The indigenous knowledge on the use of NTFPs is unique to a given culture of a human society around the world. NTFPs are generally medicinal plants, wild edible plants, house constructing materials like bamboo, rattans etc. In our study area a total of 47 species of non-timber plant belonging to 31 families were documented for various uses by the indigenous tribal groups of the region for their livelihood (Table 1).

Table 1. Non-timber forest products (NTFPs) use by tribal people.

S. No.	Scientific Name	Common Name	Family	Part used	Purpose of use
1	<i>Acorus calamus</i> L.	Boj ghos	Araceae	Roots/Rhizomes	Paste of Roots/ rhizome is applied externally in the treatment of fever
2	<i>Adatoda vasica</i> Nees.	Tita bahek	Acanthaceae	Leaves	Paste of leaves use as medicine in fever and stomach
3	<i>Albizia lucida</i> Benth.	Moj	Mimosaceae	Whole plant	Use as fire wood
4	<i>Albizia procera</i> Benth.	Siris	Mimosaceae	Whole plant	Use as fire wood
5	<i>Alpinia malaccensis</i> Rosc.	Tora	Zingiberaceae	Leaves	Leaf paste is used in ring worm
6	<i>Amaranthus viridis</i> L.	Khutora	Ameranthaceae	Whole plant	Use as vegetables
7	<i>Azeratum conyzoides</i> L.	Gundhuwabon	Asteraceae	Leaves	Leaf paste is used in small cut as a wound healing
8	<i>Baccaurea sapida</i> L.	Leteku	Euphorbiaceae	Fruits	Used as food
9	<i>Bambusa balcooa</i> Roxb.	Bhaluka bah	Poaceae	Stem	Used in house construction
10	<i>Bambusa gigantea</i> Munro.	Dolo bah	Poaceae	Stem	Used in house construction
11	<i>Bambusa nutans</i> Wall.	Mokal bah	Poaceae	Stem	Used in house construction
12	<i>Bambusa tulda</i> Roxb.	Jati bah	Poaceae	Stem	do
13	<i>Calamus jenkinsianus</i> Griff.	Raiding bet	Aracaceae	Whole plant	do
14	<i>Calamus tenuis</i> Roxb.	Jati bet	Aracaceae	Whole plant	do
15	<i>Calotropis gigantea</i> (L)	Aakon	Asclepiadaceae	Leaves	Leaf paste is used in the treatment of ring worm.
16	<i>Canarium strictum</i> Roxb.	Dhuna	Burseraceae	Latex	Use as insect repellent
17	<i>Cannabis sativa</i> L.	Bhang	Cannabinaceae.	Whole plant	Used for pain relief
18	<i>Castanopsis indica</i> L.	Hingori	Fabaceae	Fruits	Used as food
19	<i>Centella asiatica</i> L	Manimuni	Apiaceae	Whole plant	It is grined and juice is used to drink for the treatment of Stomach problem and sometime cooked and eat.
20	<i>Cephalostachyum</i> sp.	Bojal bah	Poaceae	Stem	Used in house construction
21	<i>Chrysophyllum roxburgii</i>	Bonpitha	Sapotaceae	Fruits	Used as food
22	<i>Cinnamomum bejolghota</i> Sweet.	Bontezpat	Lauraceae	Leaves	Used as food
23	<i>Clerodendrum infortunatum</i> L.	Dhopat tita	Asteraceae	Leaves	Leaf is grind and paste is used in treatment of ring worm
24	<i>Commelina bengalensis</i> L.	Konahimalu	Commelinaceae	Leaves	Latex of the leaves is used in the treatment of eye problems.
25	<i>Dillenia indica</i> L.	Outenga	Dilleniaceae	Fruits	Used as food.
26	<i>Diplazium esculantum</i> Swertz.	Dhekia sak	Dryopteridace	Leaves	Used as food
27	<i>Duchenea indica</i> Focke.	Garukhis	Rosaceae	Fruits	Used as food
28	<i>Ficus glomerata</i> Roxb.	Dimbaru	Moraceae	Fruits	Used as food
29	<i>Flacourtia cataphracta</i> Roxb.	Poniol	Flacurtaceae	Fruits	Used as food
30	<i>Garcinia morella</i> Desv.	Kujithekera	Clusiaceae	Fruits	Used as food
31	<i>Imperta cyllindrica</i> .	Ulukher	Poaceae	Whole plant	Used in house construction
32	<i>Ipomoea reptens</i> Poir.	Kolmou	Convolvulaceae	Fruits and leaves	Used as food
33	<i>Laportea crenulata</i> Gaud.	Borchurat	Urticaceae.	Leaves	
34	<i>Lasia spinosa</i> L.	Sengmora	Araceae	Leaves	Used as food
35	<i>Magnoli griffithii</i> Hook.	Gahoricepa	Magnoliaceae	Stems	Used as fire wood.
36	<i>Mangifera sylvatica</i> Roxb.	Bonaam	Anacardiaceae	Fruits	Used as food
37	<i>Mikania scandens</i> Willd.	Japanilota	Asteraceae	Leaves	Used as medicine in stomach problem
38	<i>Paederia foetida</i> L.	Bhedailota	Rubiaceae	Leaves	Used as medicine in stomach problem.
39	<i>Piper betleoides</i> L.	Aounipan	Piperaceae	Leaves	Used as medicine
40	<i>Rubus molucanus</i> L.	Jutulipoka	Rosaceae	Fruits and roots	Used as food
41	<i>Solanum niagram</i> L.	Titabhekuri	Solanaceae	Fruits	Used as food and medicine in mouth disease.
42	<i>Spilanthus paniculata</i> L.	Huhanibon	Asteraceae	Fruits	Used as medicine.

43	<i>Spondius mangifera</i> Willd.	Amora	Anacardiaceae	Fruits	Used as food
44	<i>Terminalia bellirica</i> L.	Bhumura	Combretaceae	Fruits	Use as food and medicine for stomach problem.
45	<i>Terminalia chebula</i> Retz.	Hilikha	Combretaceae	Fruits	Use as food and medicine
46	<i>Thysanolaena maxima</i> .	Jarubon	Poaceae	Whole plant	Use as Broom
47	<i>Vitex nigundo</i> L.	Posotia	Verbinaceae	Leaves	Use as food and medicine

The people of this region are mainly dependant on agriculture for their food and economy, and these NTFPs play a key role in agriculture where people use this NTFPs as a raw material for constructing different materials which help in agricultural system. Moreover, the people of the study area use NTFPs as fire wood, house construction materials, edible food and as Medicinal Plants, insect repellents, Broom etc. The NTFPs used for medicinal purposes generally are used to cure diseases like fever, pain, stomach problem, ring worm etc. Sometimes the people use the whole plant while sometime only leaves, roots, fruits, stem and latex according to their needs and use. In the study the highest use of NTFPs recorded is as edibles like fruits (32.65%), followed by Leaves (30.62%), Whole plant (18.37%), Stem (12.24%), Roots (4.08%) and Latex (2.04%) (Figure 2).

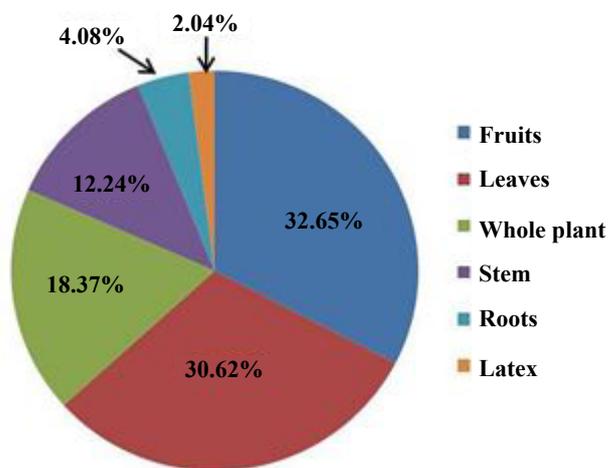


Figure 2. Different part of plant used as NTFPs.

Mostly poor and unemployed people collect and sell NTFPs in large quantities. They retain a large part of the product for their own use and sell the remaining part in the market. The income generated by the sale of NTFPs is utilized for buying cloths, shelter and other necessary items. Forest provides employment to the large population including Tribal people. During 1985 forest provided employment to about 10 million people in the primary sector. Forest and various forest activities help tribal people to improve their socio-economic condition by being employed for the collection, processing and marketing of various forest products.

### CONCLUSION

The increasing demand for medicinal plant and other NTFPs threatens the natural resource management for sustainable utilization<sup>[2,12]</sup>. Mainly, extraction of medicinal plants from the wild sources and destruction of forest for human settlement causes ecosystem imbalance and extinction of many important plant species. Therefore, now-a-days it is vital to cultivate or to domesticate wild species and practice their sustainable use. Transfer of technologies and adaptive research are needed to give adequate emphasis on the development of the NTFPs. Co-operation in research among the people and collaborative programs can help to avoid duplication and speed up the process of development of NTFPs. Along with it we must create interest among the people and specially the younger generation to conserve and to cultivate the non-timber forest product for the future earth and people otherwise these NTFPs will be extinct from this beautiful earth.

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### REFERENCES

1. Sarmah R and Saikia A. Non-timber forest products: Diversity and used pattern at Majuli the Brahmaputra river Island of Assam, India. J Bot Sci. 2014;3:41-47.
2. Sarmah R, et al. Utilization pattern of non-timber forest products (NTFPs) by the tribal people in Changland district of Arunachal Pradesh, India. J Non-Timber Forest Prod. 2011;18:105-118.
3. Nautiyal S and Kaul AK. Non-timber forest product of India. Jyoti publishers and distributors, Dehradun, India. 2003;1:1-17

4. Adepoju AA and Salam AS. Economic valuation of non-timber forest products. 2007.
5. Rao N. Significance of minor forest produces in tribal economy: A case study, Kurukshetra. 1987;7:23-28.
6. Gauraha AK. Micro economic analysis of a tribal village. Indian J Agri Econ. 1992;47:446-447.
7. Chopra K. The value of NTFP: An estimation for tropical deciduous forest in India. Econ Bot. 1993;47:251-257.
8. Malik RH. Sustainable management of non-timber forest products in Orissa: Some issues and optics. Indian J Agri Econ. 2000;55:384-397.
9. Sonowal CJ. Demographic transition of tribal people in forest villages of Assam: Study Tribes Tribals. 2007;5:47-58.
10. Kanjilal UN, et al. Flora of Assam, (Avon Book company, Delhi). 1940;4:377.
11. Moulik S. The Grasses and Bamboos of India. Vol.2 (Scientific Publication, New Delhi) 1997.
12. Sarmah R. Commonly used non-timber forest products (NTFPs) by the Lisu tribe in Changlang district of Arunachal Pradesh, India. Sibsagar College Teachers J. 2010; 5:68-77.