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The Importance of Non-Timber Forest Products in Tribal Livelihood: A Case Study of Santal Community in Purulia District, West Bengal

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ABSTRACT

Karkatia village in Purulia district is a tribal dominated village in the forest fringe areas. Lack of agricultural land, unfertile soil, lack of irrigation and poor communication compel the local people to depend completely on the forest ecosystem for their daily needs. Collections and sell of different non-timber forest products (NTFPs) for domestic and commercial purposes are considered as important means of their livelihood. The tribal people seasonally collect various NTFPs to satisfy the needs for their food, fodder and also medicine. The present study tries to explore the importance of NTFPs on livelihood of the tribal people in the forest fringe areas. Continuous field survey and interview were done with a structured questionnaire for data collection. The nature and pattern of NTFP utilization by the tribal people for domestic and commercial uses have been estimated indirectly. Result reveals that firewood and Sal leaves are the most important NTFPs which contribute significantly to the tribal livelihood. Hence, conservation of these forest products is to be given priority in forest management. Strategically, on the basis of information thus collected form field survey in NTFP resources obtainaed in the local Sal dominated forest ecosystem have been ranked according to their importance in tribal livelihood. Such importance has been assessed in terms of monetary value, volume of collection, availability and uses.

1. Introduction

Forests are home to the people who are entirely or partly dependent on forests for their livelihood (Basu, 2009). A forest provides us not only a suitable or habitable environment but also livelihood opportunities to forest fringe people by supplying various non-timber forest products. It is now widely accepted that non-timber forest products (NTFPs) contribute significantly in the livelihood options of forest dependent inhabitants, many of whom have limited non-agricultural earning. Across the World the non-timber forest products (NTFPs) are the important source of livelihood for the forest fringe tribal communities. Non-timber forest products (NTFPs) play vital role among the tribal people and provide a source of income and subsistence living (Peters *et al.,* 1989;

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Hegde *et al.,* 1996). Non-timber forest products like fuel wood, grass, fodder, food, medicinal herbs and house building materials are very important contributors to the well being or livelihood of villagers (Basu, 2009; Sarmah, 2006; Shit and Pati, 2012).

In almost all tropical countries, the collection of non-timber forest products is a major economic activity (Chopra, 1993; Sharma, 1995; Alexander et al., 2001; Ambrose, 2003) and about 500 million people living in or near forests depend on them for meeting their daily needs (Alexander et al., 2002). It is estimated that of the 6.2 bil1ion of world population, about 25 percent are dependent on forest resources including plant and animal products (Iqbal, 1993; Walter, 2001). It has also been estimated that about 60 million aboriginal people all over the world depend on the forest ecosystem for their 1ivelihood (World Bank, 2006). India is a developing country where millions of people are still living at the forest fringe areas and depend on forest products for their livelihoods (Ghosal, 2011). In India alone, over 50 million people are dependent on non-timber forest products for their subsistence and cash income (National Centre for Human Settlements and Environment 1987; Hegde et al., 1996).

Forests constitute an integral part of social life of tribals and others communities living in and around forests and forest contribute substantially to the food supply of tribal populations as well as their livelihood system. Ghosal (2011) reported in his study that forest communities, especially tribal people are highly dependent on the collection of forest products for their domestic as well as commercial needs. Most of

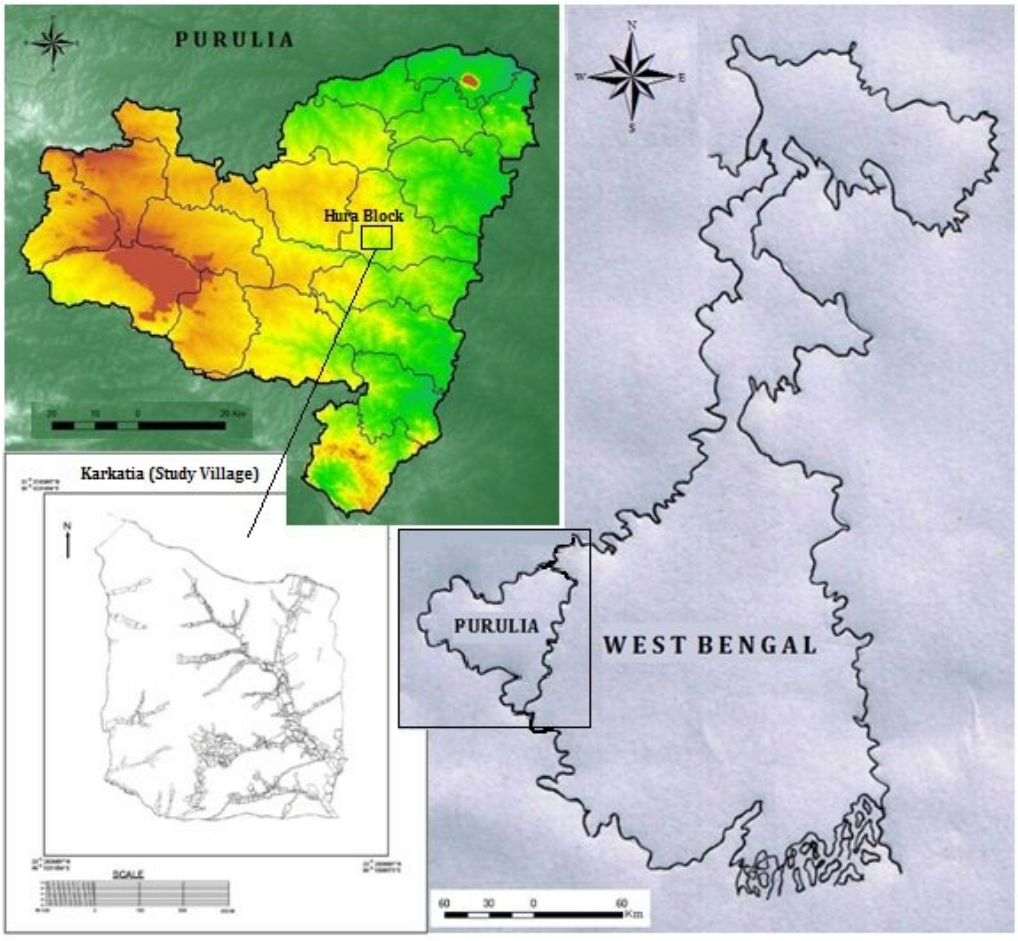

Fig. 1 Location of the Study Area

the tribal population living in forests depend on traditional medicines and do not have access to modern systems of medicine (Basu, 2009). The activities of collection of non-timber forest products hold prospects for integrated forms of development that yield higher rural incomes and conserve biodiversity while not competing with agriculture (Sharma, 1992). The potential economic value of non-timber forest products either in terms of utilization or their market value is often underestimated or unknown (Wickens, 1994). In case of West Bengal forest features vary from one place to another mainly on the basis of geo-physical characteristics. The northern part of West Bengal is covered by mountainous natural forest and sanctuaries and in the South Bengal Sundarban as mangrove forest. On the other hand, the south-western part of West Bengal is covered by Sal dominated forest and in some cases by mixed un-classed forest. The people, mainly tribals living within or in the margin of forest areas collect non-timber forest products in their daily life (Ghosal, 2011; Shit and Pati, 2012). Purulia district is one of the important tribal dominated areas in western part of West Bengal. Livelihood on the basis of NTFPs is a process of traditional life style in tribal communities in Purulia, West Bengal. This paper tries to focus on the various uses of NTFPs and their significance on livelihood pattern in case of a Santal village in Purulia District, West Bengal.

The study is based on tribal culture and its relation with the environment and for this we have selected a village in Purulia district, which is located in the western most part of West Bengal, belonging to the eastern plateau region of India. The studied village is Karkatia (23^0 27' 43.86N to 86^0 55' 08.57E) of Keshergarh Gram Panchayat under Hura block (Fig. 1). Climatically, the area is subtropical and sub-humid, with hot wet summers and cool dry winters characterized by annual mean temperature of 25.6° C and mean summer and mean winter temperature of 29.0° C and 21.3° C, respectively. The rationality behind selection of this study area is that a large percentage (>95%) of population living in this village belong to tribal and the village is covered with natural forest (> 80%). So, there is immense scope for ethno ecological studies of this botanically rich area and tradition and culture of the tribal society which is closely related to the nature. Therefore, the objective of this paper is to find out the uses and importance of non-timber forest products collected by this tribal people for household as well as commercial purpose and to see how they use different NTFPs in the context of their traditional and cultural practices.

2. Materials and Methods

This study is based on a broad range of information on how the nature and natural resources are perceived and cognated by the local people, how they interact with the natural environment throughout their life. Basically most of the information was collected from oral sources, while interviewing the aged person or '*Gaonbura*' of the tribal village or the medicine man or '*Ojha*' of the society (Fig. 2). Some published books and research works on the related subjects were used for getting the medicinal, ecological and economic values of different plant species (NTFPs) which are used as food, fodder, medicine, dye, commercial products, domestic articles, house building material etc. Most of the information on utilization of forest resources were collected through empirical survey by randomly selected 35 household.

Empirical field survey was carried out with a predesigned questionnaire. Total work is segregated into different parts to understand the spatial allocation of man and resources over the landscape. At first, we have analyzed the land use land cover of the study area at time points to understand the human forest interaction and man environment relationship as exists in the tribal society. Sample of different plant species have been collected from the nearby forests of the study area with the help of a local people boy for their identification and uses in the tribal society. Those plant species were sent to the department of Botany, Vidyasagar University for identification. To take stock of the month wise availability of NTFPs we have prepared yearly schedule for NTFPs collection along with information regarding uses of plant parts and volume of annual collection of each of the products. Such information has been collected by survey in selected households. A survey was done in the local market for enumeration of market values of those NTFPs. Finally we have analyzed the economic or market value of those non-timber forest products on the basis of their rent in the local market to understand the economic potential of the NTFPs and viability of NTFP collection and sell as a livelihood option for the tribal people.

This study area was selected on the basis of following condition:

- The village under study can be reached easily.
- Forest is the major source of livelihood for the tribal people living in the forest fringe villages.
- Poor water availability and soil infertility make agricultural activities limited.
- Available Non Timber Forest Products are the important source of income for forest fringe dwellers.

Fig. 2 Interaction with tribal people during field survey

3. Results and Discussion

The forests of the study area are usually multi-layered comprising a top canopy, lower canopy, shrub, short grass and herb layers which yield rich and diverse types of forest products. The tribal communities of forest fringe areas in Purulia district are highly dependent on the collection of non-timber forest products for domestic uses as well as commercial purposes. The most widely collected NTFP is the Sal leaf including branches and twig (known as 'dantan'). About 20,000 plates of Sal leaves can be collected by a family per month. Sal twig is used as a 'chew stick' for cleaning and brushing teeth. Another important NTFP is the leaves of Kendu, which have a high economic value because of their use in rolling 'biri' (local cigarettes). Although, kendu is a slow growing plant, easy collection of the leaves and relatively higher return make people interested in collection of these leaves. The collection of root of Satamuli and Anantamul and the flowers of Mahua are also important commercial NTFPs which are available throughout the year (Table-1). Different types of fruits like Behela, Bahara, Amlaki, Haritaki, Ban-kundri etc.

are important NTFPs used as food and for other domestic purposes. The most important and widely collected NTFP is firewood which is collected at about a rate of 250kg per month per family throughout the year (Table-1). During the day time females (more than the males) play vital role in collecting that NTFPs. Primarily, the Santal people of the study area collect the NTFPs from forest for two purposes as discussed bellow.

3.1 Forest as a source of food and domestic uses

In the study area, the Santal people are economically very poor in nature. They have limited capability to obtain their daily foods from market. In Purulia district, most of the forest fringe dwellers have no cultivated land in their own, while villagers living inside the forest possess an insignificant amount of cultivated land within the forest (Fig. 3). These cultivated lands were made available for agriculture through slash and burn in the past. Normally, they grow rainfed crops during the monsoon season. As irrigation is not available within the forest and the land is of relatively poor quality, forest dwellers cannot depend entirely on farming for their subsistence (Ghosal, 2011). The studied village experiences the same condition. Therefore, very low productions of agricultural crops make them too dependent on non-timber forest products. Thus, NTFPs collections are an essential activity for their daily life. There are 35 households in total and all belong to Santal, a tribal community. So, all the people depend on forest resources for their source of food and different domestic uses. Different vegetables and fruits like Behela, Bahara, Amlaki, Piyal etc are collected as a source of articles (Fig. 6). Those fruits have seasonal variation in their collection, because all those fruits are not available through every month of a year. Generally the duration of availability of these different fruits is 3-4 months in the year but in particular seasons (see Fig. 5).

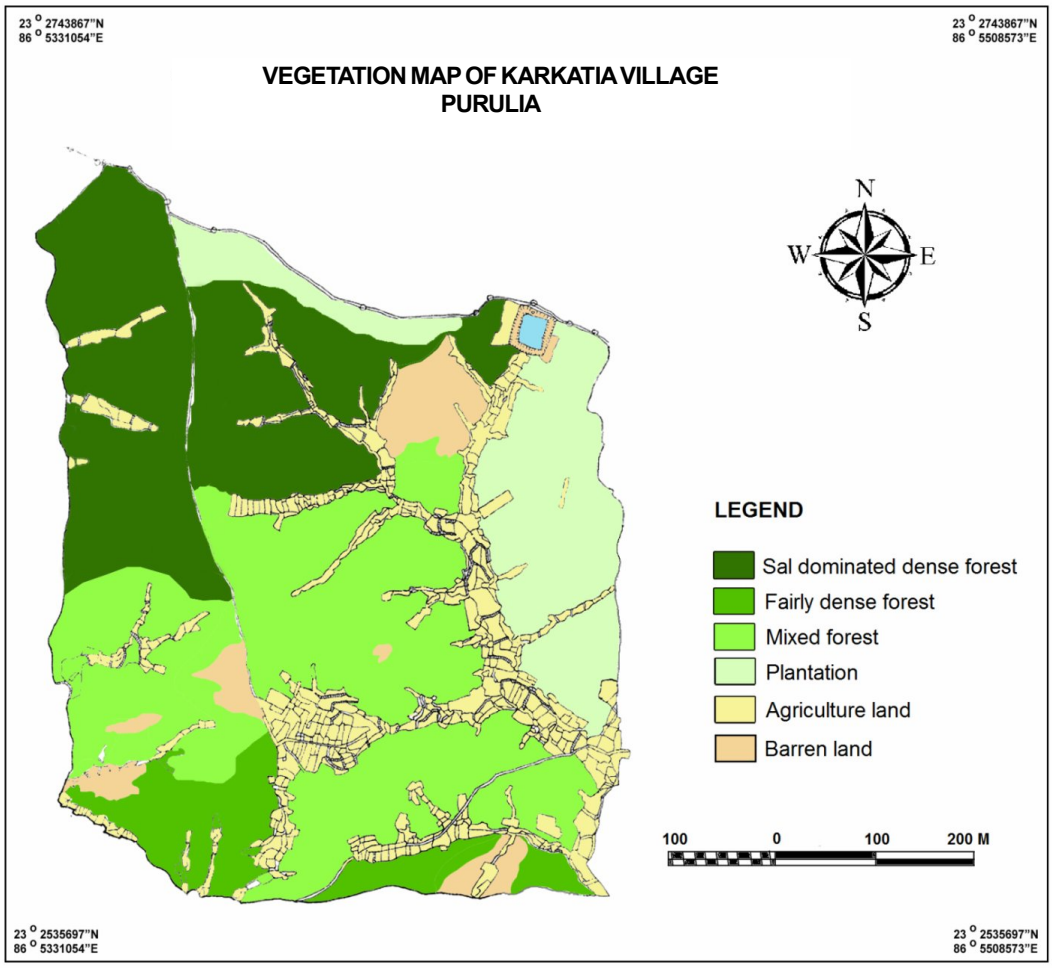

Fig. 3 Landscape resources of the Study Area

3.2 Forest as a source of income and livelihood

The fringe dwellers collect non-timber forest products not only for food or domestic uses but also for commercial purposes. The NTFPs are the most important source of income of the studied villagers in Purulia district (Campbell and Tewari, 1995). The Santal people collect the different NTFPs in commercial mode, from which they earn money spent to fulfil their daily needs. They have a limited source of income from agriculture and wage laboring; for this reason the NTFPs are of great support to household economy. Very poor transport and communication long distance from local or city market, inaccessibility to industrial products and others resources etc are important reasons for their higher dependency on non-timber forest products in this village. It has been estimated that every year about 20 to 50% of household income comes from NTFPs harvesting in the districts of Purulia, Bankura and Paschim Medinipur (Development and Planning Department, Government of West Bengal, 2007).

The ten most important non-timber forest products have been ranked on the basis of month wise availability, domestic importance, commercial potential and market value of each product (Table-2). The firewood has been the most important NTFP in an average 250 kg firewood is collected by the local people per month per family throughout the year. Thus, the firewood is the major source of income for forest fringe dwellers. Sal leaf and Kendu leaf are other important NTFPs collected by the local community to earn money. People collect Sal leaves

Table 1 : Various aspects of NTFP collection

Name of plant	Scientific Name	Collected Parts as NTFPs	NTFPs collected by	Yearly time table of Collection	Amount of product collected by each Family/month
Behela	*Semecarpus anacardium*	Fruit	Female		4 kg
Bahara	*Terminalia bellerica*	Fruit	Male/Female		2 kg
Mahua	*Madhuca indica*	Flower	Male/Female		15 kg
Amlaki	*Emblica officinalis*	Fruit	Male/Female		3 kg
Sal	*Shorea robusta*	Leaf	Male/Female		20000 plates
Palash	*Butea monosperma*	Flower	Female		1 kg
Benian	*Ficus benghalensis*	Leaf	Male/Female		50 pices
Satmuli	*Asparagus racemosus*	Root	Male		1.5 kg
Dhubi	*Cynodon dactylon*	Leaf	Male/Female		150 pices
Kend	*Diospyros melanoxylon*	Leaf	Male/Female		20000 pices
Haritaki	*Terminalia chebula*	Fruit	Male/Female		20 kg
Mushroom	*Agaricus bisporus*	Plant	Male/Female		3 kg
Piyal	*Buchanania lanzan*	Fruit and leaf	Male/Female		2 kg
Kurchi	*Holarrhena antidysenterica*	Seed	Male/Female		5 kg
Anantamul	*Hemidesmus indicus*	Root	Male		500 g
Khamalu	*Dioscorea bulbifera*	Tuber root	Male		30 kg
Kalmegh	*Andrographis paniculata*	Leaf	Male/Female		1 kg
Arjun	*Terminalia arjuna*	Bark	Male		25 kg
Ban-kundri	*Coccinia grandis*	Fruit	Male/Female		2.5 kg
Simul	*Bombax malabaricum*	Flower	Female		25 kg
Firewood		leaves and Branches	Male/Female		250 kg

from their nearest forest and make plates in their own hand. After drying, they sell these plates in the nearest market and some people sell not only Sal plates but single Sal leaves also in the nearest city or local market. By selling Sal plates and Sal leaves each family earns Rs. 1000-1200 per month on an average (table–2). Another important NTFP is Mahua flowers collected by those people. Each family collects about 15 kg Mahua per month on an average. From the seeds of Mahua one type of oil is produced by the village people, which is used in domestic purposes like cooking and body massage and they also sell the oil in market. During the preparation of Mahua oil one type of wax is produced that is also used for different purposes like preparation of mosquito coil, medicine of pain etc. The Mahua flowers are also used to make liquid alcohol which is consumed during different social occasions and festivals. Similarly, some fruits like Behela, Bahara, Amlaki, Haritaki, Piyal etc. and some plant roots like Satamuli,

Fig. 4 Sal dominated forest (left) and mixed forest (right) in the study area

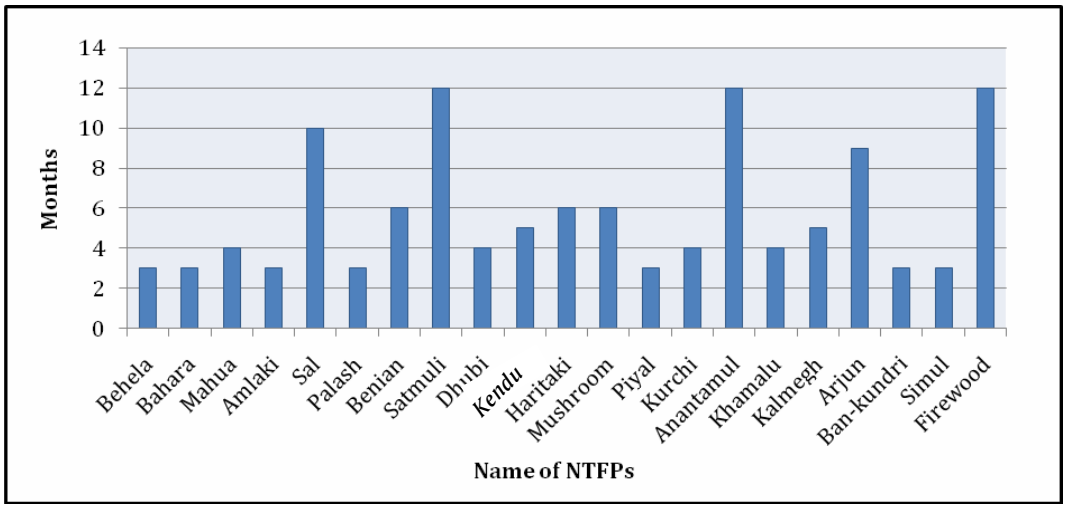

Fig. 5 Month wise availability of NTFPs

Anatamul etc. are used for domestic as well as commercial purposes. Thus, those NTFPs have some market value (see table–2), which are the important sources of income of these tribal people.

Man-Nature relationship and livelihood pattern

Non Timber Forest Products have an important role in the livelihoods of tribal people living in the forest fringe areas. Those people are very much dependent on NTFPs for different domestic purposes like food, fodder and medicine (Dey and De, 2010, 2011). Regularly they collect leaves of different plant and firewood (Fig. 7). Therefore, those tribal people have an integrated relation with forest that regulates their livelihood pattern. The tribal villagers of the studied area have very poor link with the advanced world. The poor agricultural productions, infertile land, poor facility of irrigation, inaccessibility to transport communication system etc. make them forest bound. Thus, in their daily livelihood they collect different fruits, plant roots, mushrooms etc as food. They have also poor accessibility of hospital and other health facilities. Therefore, they collect some medicinal plants (Fig. 6) for ailment from various diseases (Dey and De, 2012). They also collect firewood, Sal leaves and Kendu leaves, Mahua etc. from forest to earn money. The Santal people of the study area live within the forest areas so they can easily collect NTFPs from forest. At least one person (male or female) from one household goes to forest to collect different types of non-timber forest product. Generally we observe that female population play important role to collect NTFPs in this study area (see table – 1). This tribal people know the importance of forest in their lives. They use the forest resources for their daily needs and conserve

Fig. 6 Some medicinal plants from the study area

the forest with their traditional environmental knowledge. Thus, we find harmonious relationship between man and nature and their livelihood pattern in this studied area.

4. Conclusion

From this study we can conclude that non-timber forest products have played the most important role in tribal livelihoods and in fulfilling people's daily

Fig. 7 Firewood collection by tribal women

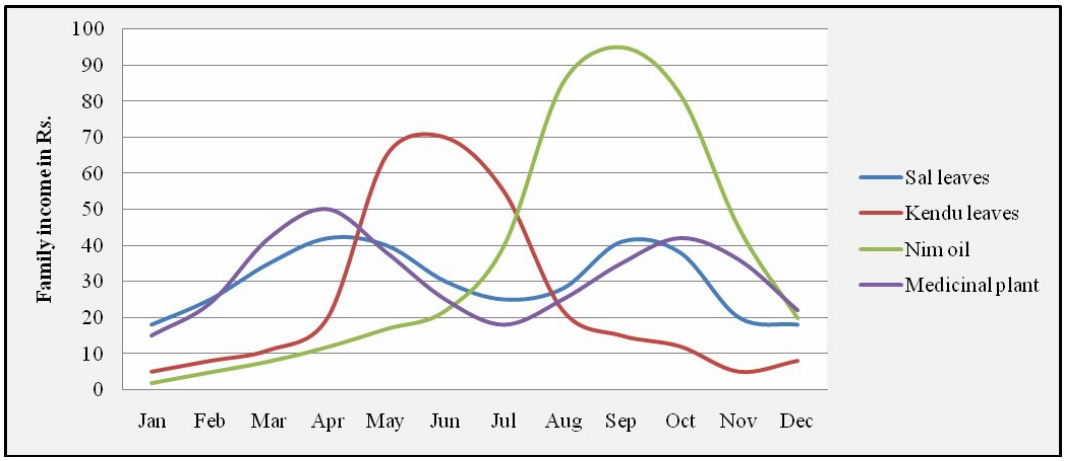

Fig. 8 Month wise distribution of some important NTFPs in terms of family income

needs, especially of food and medicine. Male and female including child of the tribal communities collect the NTFPs. Lack of modern opportunities makes them largely dependent on various types of NTFPs, which are not only used in households but also the important sources of income (Fig. 8). It is clear that NTFPs are important sources of income of forest fringe dwellers but it is difficult for them to maintain these forest based livelihood for long in future. Because the forest coverage is gradually reducing day by day and quality and quantity of available NTFPs have gone down. Therefore, tribal people of forest fringe areas suffer from reduced income. If we want to protect the forest and these forest resources, it is necessary to identify important NTFPs and promote the regeneration of those plant species which provide various NTFPs. The Santal community of the studied area has a great traditional ecological knowledge, so they utilize the NTFPs without destroying the forest resource base. The unique man-nature relationship maintained in the area may help to conserve and utilize the forest resources properly. Although at present, those tribal people are availing modern opportunities of transport communication, market and also modern health facilities, the traditional knowledge of tribal people and the proper uses of NTFPs in their livelihood pattern may be helpful in formulating strategies to conserve the forest and environment. Moreover, different NTFPs are currently gaining more and more importance in the market, which may increase income opportunities for forest fringe tribal people in the future. As we know there are some physical barriers for agricultural production in forest areas, a systematic way of harvesting of NTFPs and introduction of modern technologies may bring more improvement in the uses of NTFPs and thus NTFPs may become potential sources of income for the forest fringe dwellers. At the same time it will be possible to conserve the natural forest and environment.

Table 2 : Ranking of locally available important Non Timber Forest Products

Name of NTFPs	Availability	Quantify of product collected in a year/family	Commercial importance	Household importance	Market value of product	Rank
Firewood	12 months	2500 kg	✓	✓	Rs. 1.5-2.0/kg	1
Satmuli	10 months	18 kg	✓	✓	Rs. 2-3/kg	9
Sal leaf	8 months	20000 plates	✓	✓	Rs. 50/1000 plates	2
Mashroom	6 months	18 kg	✓	✓	Rs. 10-12/kg	7
Kend leaf	5 months	10-12 Bundle	✓	✓	Rs. 25/ Bundle	3
Mohua	4 months	60 kg	✓	✓	Rs. 5-7/kg	4
Piyal	4 months	8 kg	-	✓	-	10
Bahara	4 months	8 kg	✓	✓	Rs. 2-3/kg	8
Amlaki	3 months	9-10 kg	✓	✓	Rs. 4-5/kg	5
Haritaki (fruit)	3 months	20 kg	✓	✓	Rs. 3/kg	6

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