



Ethnobotanical Knowledge of Medicinal Plants among Tribal Communities in Orissa, India

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Abstract

Non-timber forest products (NTFPs) are an important source of Pharmaceutical industries for developing a variety of drugs in one hand and in other hand income for the traditional communities living in and around forests. The pressure on forests for the collection of NTFPs has motivated conservation biologists and forest managers to find ways to harvest NTFPs in a sustainable manner. Identification of plant species is the first and foremost criterion in planning for sustainable utilization of resources. The present study was conducted in five-forest division covering 12 villages having an average 345 households of Keonjhar district in Orissa on various NTFPs products. A total of 24 plant species of NTFPs are collected from the forest. The collected NTFPs were used in different purposes i.e. medicines, vegetables, essential oils, dye yielding, food items and other miscellaneous items by the tribal people. The seasonal variations of the availability of NTFPs indicates that there were seven NTFPs found in winter season, eight found in summer season, four in monsoon season and five found in around the year. It was observed that 88.9% villagers were engaged in agriculture followed by (10.14%) labor category and only 0.86% in business or service class. In this study, it is suggested that the tribal community should be involved in the established market chain for marketing of NTFP's. This will be also useful for the conservation and maintenance of NTFPs, which is a major livelihood option for poor traditional communities if we used in a sustainable way.

Keywords: Conservation; Harvesting; Livelihood; Marketing; Non-Timber Forest Products; Sustainable

Introduction

Forest plays an important role in enhancing livelihood requirements for rural community and in maintaining ecological balance. Over 53 million tribal people in India belong to 550 communities of 227 ethnic groups [1-3] and about 60% of the rural communities directly rely on forest for their day-to-day requirement. The dependence of communities on forest can be judged from the fact that an average tribal family draws half of its annual income from forest, 18% from agriculture, 13% from cattle and 18% from other employment [2,4]. Indigenous people have good knowledge of the floristic wealth of their surroundings and having close association with biodiversity rich areas. Apart from timber and firewood that are conceived as major forest produces, non-timber forest products (NTFP) include all products obtainable from forest. NTFPs indeed play a very significant role in the rural economy in terms of providing employment, income potential and life support sustenance [5]. For hundreds and thousands of years, indigenous communities have been utilizing NTFPs for various purposes i.e. edible, medicinal, food and other purposes and have been considered as the secondary production. However, it has acquired some importance in the recent years in policy strategies of the government owing to its significance in life support substance to numerically large number of forest dwelling communities. During the last few years, NTFPs have become adversely affected due to anthropogenic pressure (i.e., encroachment, unsustainable harvesting, forest fire and overgrazing). Moreover, unlike timber that brings profits to government treasure, economic benefits provided by NTFP are accrued largely by the local people and forest dwellers [6,7].

In India Orissa is the second largest state producing NTFPs and 37% of its population depend on NTFPs for their daily day-to-day requirements. The Keonjhar district of Orissa, is harbours a rich

diversity of ethnobotanical species, which generate considerable benefits from social and economic perspectives. Until now, people are preparing medicines from their available species of plants, which were used to treat common diseases. Ethnomedicinal uses of plants in different parts of Orissa are well studied [8,9]. However, Keonjhar district is often ignored in spite of the luxuriant growth of ethnomedicinal plants in and around different blocks of the district. There is also not taxonomically or ethnobotanically studies done on these plant. Therefore, the present study has been designed to report the ethnobotanical uses of different NTFPs by the local people. The objective of this study is to motivate to the forest dwellers and villagers to come forward for the utilization, cultivation and marketing of NTFPs from this region.

Study area

This ethnobotanical study was conducted in the Keonjhar district of Orissa state of India during year 2006-2007. The district of Keonjhar, lying between 21° 1' N and 22°10' N latitude and 85° 11' E to 86° 22' E longitude. The district presents a panorama of millennia, both from the geographical and anthropological point of view and spread over an area of 8,240 Sq. k ms Figure 1. The soil of the district is mostly

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red throughout the district and in the south, there is a small patch of black cotton soil. The important minerals available in huge quantity in the district are Iron-ore, Manganese and Chromites. The climate of the district is characterized by an oppressively hot summer with high humidity. Summer generally commences in the month of March. Temperature begins to rise rapidly attaining the maximum in the month of May. During the summer, maximum temperature is 38.2°C. The weather becomes more pleasant with the advent of the monsoon in June and remains as such up to the end of October. The temperature in the month of December is lowest i.e. 11.7°C and sometimes it even drops down to 7°C. The average annual rainfall is 1534.5 mm.

Socio-economic setup

The study villages are located in interior pockets surrounded by hills and forests. Many villages are not physically accessible easily to the outsiders. The hills and uplands determine the quality of land and land based productivity. The multiple sources of economy of the people consist of animal husbandry, agriculture, forestry and wage labour. The modern village institutions in the name of Van Samrakshan Samiti

(V.S.S), Self Help Groups (SHG), Village Development committees (VDC), Village Education Committee (VEC) etc. are supported and influenced by the traditional village institutions, which are guided by the culture and cultural practices of the target communities. There are eight types of STs, living in Keonjhar district, including 4 primitive tribal groups (PTGs) and 12 Schedule cast (SC) communities. The principal tribes were Bathudi, Bhuyan, Bhumij, Gond, HO, Juang, Kharwar, Kisan, Kolha, Kora, Munda, Oraon, Santal, Saora, Sabar and Sounti. These sixteen tribes constituted 96.12 % of the total tribal population of the district.

Methodology

A household survey was conducted using questionnaire and oral interviews with locals to study the uses of NTFPs, annual collection of NTFPs by household and market value of these NTFPs in the selected villages. The indigenous use pattern of each species was also documented during group discussion with the locals. Indigenous people actively engaged in indigenous knowledge were interviewed for recording their unique knowledge about traditional and indigenous

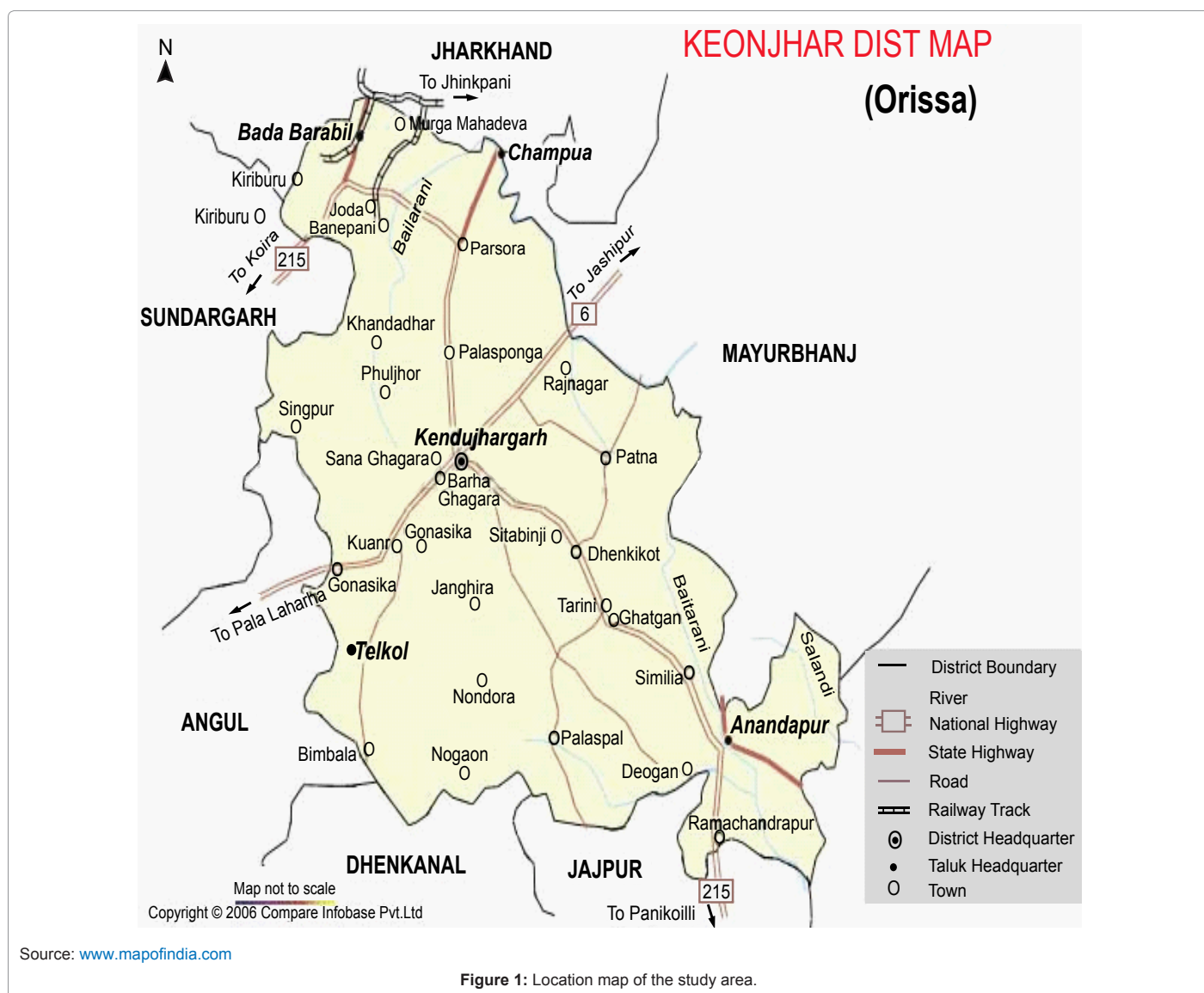


Figure 1: Location map of the study area.

uses of different plant species and their mode of usage. Information on plant local names, local uses and plant parts used and collection methods of each species was also captured. In addition to this, focused group discussions (FGD) were conducted with different age groups of people i.e., (6-12 years, 13-18 years, 19-45 years and above). Ethnobotanical data viz., local name, mode of preparation, medicinal uses were collected through questionnaire, interviews and discussions among the tribal and health practitioners in their local language. Our questionnaire allowed descriptive responses on the plant prescribed, such as part of the plant used, medicinal uses. Voucher specimens were collected identified, by referring standard local floras [10].

Results

A total of 24 plant species of NTFPs are collected from the study site and documented detail about ethnobotanical knowledge. Out of all these eight were collected daily, ten collected weekly, six on fortnight basis. The seasonal variations of the availability of NTFPs indicates that there were seven NTFPs found in winter season eight were found in summer season, four in monsoon and five around the year (Table 1). The commonly collected NTFPs were used in herbal medicines, vegetables & oil seeds, transtuff and dyestuff, food items, and other miscellaneous items. Among five groups of NTFP, drugs constitute the

SL No	NTFP	Botanical names	Family	Season of availability	Mode of collection
1	Anla	<i>Emblica officinalis</i>	Euphorbiaceae	Winter	F
2	Ashwagandha	<i>Withania somnifera</i>	Solanaceae	Summer	W
3	Bela	<i>Aegle marmelos</i>	Rutaceae	Monsoon	W
4	Chironji	<i>Buchanania lanzan</i>	Anacardiaceae	Summer	D
5	Nimba	<i>Azadirachta indica</i>	Meliaceae	Summer	F
6	Bahada	<i>Terminalia bellerica</i>	Combretaceae	Winter	F
7	Basanga	<i>Adhotoda vasica</i>	Acanthaceae	Summer	D
8	Chakunda	<i>Cassia Tora</i>	Caesalpiniceae	Winter	D
9	Harida	<i>Terminalia chebula</i>	Combretaceae	Winter	F
10	Karanja	<i>Pongamia pinnata</i>	Fabaceae	Winter	F
11	Kendu	<i>Diospyros melanoxylon</i>	Ebenaceae	Summer	F
12	Kusum	<i>Schleichera oleosa</i>	Sapindaceae	Monsoon	D
13	Mahua flower	<i>Madhuca indica</i>	Sapotaceae	Summer	D
14	Mango	<i>Mangifera Indica</i>	Anacardiaceae	Summer	W
15	Padmachakra	<i>Gissampelos parciria</i>	Menispermaceae	Whole year	W
16	Palasi	<i>Butea monospema</i>	Eabaceae	Monsoon	D
17	Patalgarud	<i>Rauwolfia serpentine</i>	Apocynaceae	Whole year	W
18	Pita alu	<i>Dioscorea wallichii</i>	Dioscoreaceae	Whole year	W
19	Sal leaves	<i>Shorea robusta</i>	Dipterocarpaceae	Whole year	W
20	Siali fruit	<i>Boswellia serrata</i>	Burseraceae	Winter	W
21	Tamarind	<i>Tamarindus indica</i>	Papilionaceae	Summer	W
22	Tulasi	<i>Ocinum sanctum</i>	Lamiaceae	Winter	D
23	Tejpatta	<i>Cinnamomum tamala</i>	Lauraceae	Whole year	W
24	Mushrooms	<i>Mucuna pruriens</i>	Leguminosae	Monsoon	D

Note: F= Frequently, D= Daily, W= Weekly

Table 1: Season availability, mode of collection of NTFPs by household.

largest proportion of the total in all followed by food items (Figure 2). The production potential of NTFPs varies from region to region owing to the fact of differential natural conditions, socio-climatic conditions, rainfall, biodiversities and more importantly the ecological and environmental conditions. However, the mode of collection also varies from species to species within the season of availability. The collected

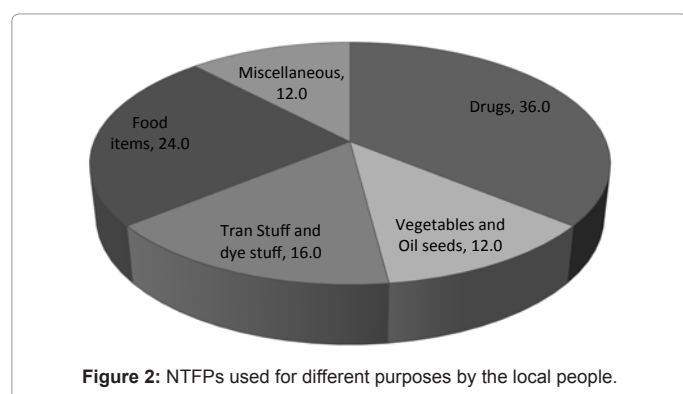


Figure 2: NTFPs used for different purposes by the local people.

SL No	Botanical names	Part used	Traditional Uses by Family
1	<i>Emblica officinalis</i>	Fruits	Fruit are used as ain rheumatism
2	<i>Terminalia bellerica</i>	Fruits	Fruit are used as a herbal medicine
3	<i>Terminalia chebula</i>	Fruits	Fruit are used as in stomach pain
4	<i>Pongamia pinnata</i>	Fruit	Fruit are used as a herbal medicine
5	<i>Schleichera oleosa</i>	Seed	Oil seed, medicine and soap
6	<i>Mangifiers Indica</i>	Fruit	Fruit are used in vomiting and stomach pain.
7	<i>Rauwolfia serpentine</i>	Root	Roots are used as a herbal medicine
8	<i>Shorea robusta</i>	leaves	The leaves are used for making leaf plates used for edible.
9	<i>Tamarindus indica</i>	Fruit	Tamarind is mainly for the fruit and used in variety of dishes.
10	<i>Cinnamomum tamala</i>	Leaves	Used as spices.
12	<i>Buchanania lanzan</i>	Seeds	Seeds are used after grinding for cooking.

Table 2: Traditional use of NTFPs by the house holds.

NTFPs are from wild used by the local communities for curing a verity of ailments since long time (Table 2). The popularly collected NTFPs by majority of people reported in the study includes *Shorea robusta* (95%), followed by mushrooms (92%), *Mangifera Indica* (92%),

Diospyros melanoxylon (80%), *Schleichera oleosa* (67%), *Boswellia serrata* (62%) and 54.6% *Madhuca indica* (Figure 3). *Shorea robusta* leaf and seed are used by tribal people for their livelihood. Leaf used for the plats ad the seed used for oil. *Diospyros melanoxylon* (Kendu leaves), also called Blackwood (Indian ebony), used in making *bidis* (Indian cigarettes). *Diospyros melanoxylon* are the most important NTFP, both from the point of view of the poor as well as the State. *Schleichera oleosa* (Kusum) *Boswellia serrata* seeds are also used for oil. However, most of the NTFPs used by the indigenous people for food and other food supplements, only these people used few species for medicinal purposes. It was observed that 88.9% villagers were engaged in agriculture followed by (10.14%) labour class and only 0.86% in business or service class (Table 3). Distribution of different age groups people engaged in the collection of NTFPs also vary, it was found that the age class between 18-45 years were highly engaged in collection of NTFPs compare to other age groups (Table 4). For collection of NTFPs, maximum distances of 6 to 10 k.ms were covered by 48.6% households for the collection of NTFPs (Table 5). The quantity of collection of NTFPs depends upon its marketability as well as its availability in the

forest areas near to the village. Apart from *Diospyros melanoxylon*, which is collected by the department, rest of the NTFPs collected by the locals surreptitiously. However, NTFP collection is one of the main sources of livelihood for people who live below poverty line (BPL). In the district, tribal and non-tribal communities prefer to collect those NTFP species, which give them maximum returns.

Discussion

The study classifies NTFP's according to various purposes, frequency and mode of collection across the seasons, age group. In present study, sal leaves fetch a lucrative source of income to primary collector households. It can be inferred that the volume of procurement in the critical months indicates greater proportion to meet the pressing needs of the households when the distance and time factors do not stand on the way. Analysis of the data reveals that *Shorea robusta* leaves, as well as mushrooms are the main NTFPs collected in Keonjhar district. It is observed that household prefers collection of *Madhuca indica* and *Schleichera oleosa* knots as compared to other NTFPs. The forest dwellers economy is heavily dependent on precious

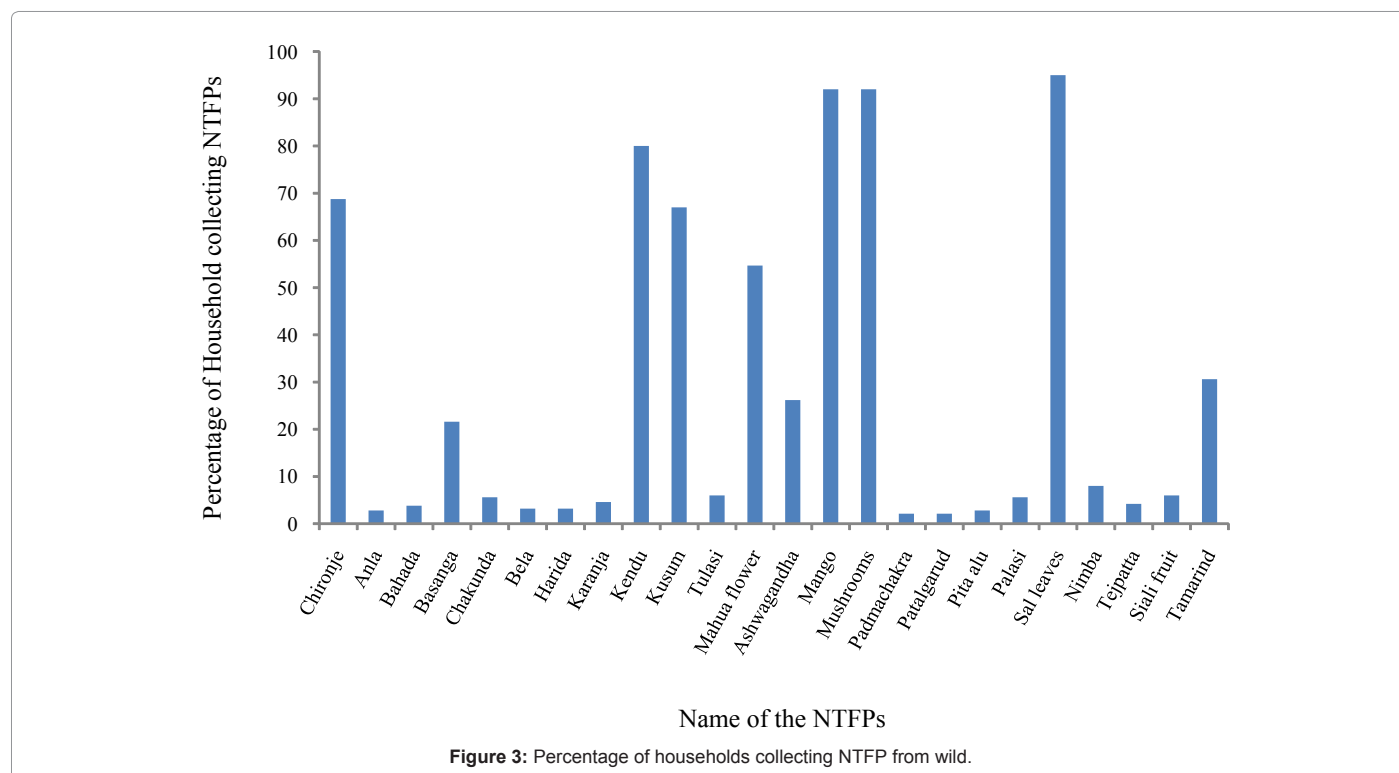


Figure 3: Percentage of households collecting NTFP from wild.

Forest Divisions	No of village covered	Total no of HHs	Population			Total	Primary Occupation		
			Male	Female	Children		Agriculture	Labour/NTFP	Business Service
Keonjhar	12	345	613	581	695	1889	307 (88.98)	35 (10.14)	3 (0.86)

Table 3: Distribution of population covered in the study in the Forest Division.

Forest division	Total HH	Age distribution (in Years)												Total		
		6 to 12			13 to 18			18 to 45			45 above			Persons engaged in NTFP collection		
		Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Keonjhar	345	112	139	251	62	97	159	187	248	435	62	128	190	423	612	1035

Table 4: Distribution of different age group engaged in the collection of NTFPs.

Distance covered (in k.m.)	Response in percentage (N=345)
>2	5.79
3 to 5	18.55
6 to10	48.69
11 to 15	16.52
16 & above	10.43

Table 5: Coverage of average distance by households for the collection of NTFPs (In k m).

forest resources in general and NTFP's in particular. Another aspect of NTFP's procurement is the lack of full optimization of collection despite huge forest potential due to difficult terrains and inaccessible regions, constraints of market networks, poor and inadequate collection by government sponsored agencies, co-operatives and exploitative interest of businessmen, traders and middlemen, stringent forest laws etc. Despite of this, the forest dwellers are still depending on NTFP's to a substantial extent. Since agriculture yields are lower and uncertain in many areas, the dependence on NTFP's in terms of collection, processing and marketing is still high both for food security and for household needs [11]. Besides these, NTFPs, *Diospyros melanoxylon* leaves also contribute significantly to a household income despite its trade being governed by forest department. Bhattacharya and Hayat [12] conducted a study in sheopur kalan forest division of Madhya Pradesh and reported that several commercially important species were become extinct including, *Boswellia serrata*, *Sterculia urens* and *Phyllanthus emblica*. With changing political economy of forest resources around the world, benefits of NTFPs are increasingly discussed in valuing tropical forests [13]. The study shows that market forces namely demand for and supply of commodities determine the price of NTFP's.

The nature of the products also influences the market behavior and unorganized market bargaining between unequal ultimately determines the price behavior. Many traders at the road head and among the main trails are the critical link between these NTFPs and the market. They receive market information on species and price along with cash advances from large wholesalers; they are the first major point of transaction for local collectors. The data also observes that some of the agents are product- biased since they deal with particular products. In this process of commercialization of NTFPs, as observed in the ground, it is expected to dominate the market network.

Conclusion

In the state economy, it is observed that the economic contributions of NTFP can't be ignored. From the current study, it is revealed that collection of NTFP species varies according to their market demand and availability, therefore, in order to provide better price of NTFPs to the villagers/collectors, steps should be taken to promote sustainable collection of NTFPs and it becomes imperative to develop marketing facilities. In addition, a numbers of opportunistic buyers from nearby town periodically visit the villages in search of direct supplies thus; the establishment market facilities will also improve the market access of NTFP collectors. However, by developing capacity of local to adopt the value addition options for NTFPs so that their household income improves substantially. However, an attitudinal gradient in the mind of the forest dwellers has been observed which have shifted from a pure constructive dependence to destructive dependence. Therefore, efforts are urgently require for conservation and sustainable marketing of theses NTFPs involving the local tribal communities of the region.

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