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Role of Non-Timber Forest Products (NTFPs) in The Livelihood in Sahariya Tribal Economy of Shivpuri District Madhya Pradesh, India

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Abstract:
This study examined the role of NTFPs in tribal economy of Shivpuri district Madhya Pradesh, India. A multi-stage random sampling technique was employed to select sample Saharia Tribal, local villagers and households for field survey. Data were collected through structured interviews and non-participant observations and commercialization of NTFPs are the main drivers for socioeconomic development, poverty reduction and livelihood security of the tribes in the area.

In the presented study, mainly how non-timber forest products are obtained by Sahariya tribals under Shivpuri district and what things they get from the forest. The product found in the forests are able to improve their economic condition and livelihood by selling it in the local market. Many major products are obtained from forests by the tribal peoples found in and around Chatori Kala village under Shivpuri district, such as Mainly Tendu (Diospyros melanoxylon) leaf which is used for making beedis Industry, Imli (Tamarindus indica) is used for making wine Industry, Mahua (Madhuca indica) flowers is used in the beverage industry. Kher (Acacia catechu) is used in the Kaththa Industries and Bamboo (Bambusa indica) is used in the building material, apart from this brooms, baskets, fans as well as other product used in the house are also made from bamboo and Palash (Butea monosperma) which is found in dominant species in Shivpuri district, is used for preparing puja and havan material and its roots are used in making rope and leaves are used in Dona Pattal industry.

For many years, some indigenous tribal people have been living within the forest and fully depending on the forest products for livelihood. Since it has become a protected area, there is banned on the collection of NTFPs. Forest department forcefully displaced some tribal people outside the forest, but still many tribal people are living within the forest and depending on the forest for their livelihood. This study has made an attempt to examine the Socio-economic role of NTFPs in the livelihood of Saharia tribal people in the Chitorikala village area of Shivpuri District in Madhya Pradesh. The study found that almost all tribal people in the study villages collect NTFPs illegally and sold in local markets. The NTFPs contribute highest income shares to total household income. As there is no restriction on the collection of leaves, Stem, Seed, Root, Fruit, wood etc. They earned highest income by selling various leaves but they walk 05 to 10 km and spend whole day to collect leaves, Root and Tuber and other products. As the livelihoods of the tribal people of these villages depend on NTFPs, the study suggests that there must have markets and proper price for these products. Government should provide some financial benefits to self-help groups allow people to set up paper plate or cup factory to avoid traders' dominance.

Keywords: Economic Development, Forest, Gender, Production, Consumption, Education

Introduction

The district is bounded on the North by Morena, Gwalior and Datia districts, on the East by Jhansi district of U.P. on the West by Kota district of Rajasthan and on the South by Guna district. The district mostly laid out over small hill tops covered with deciduous forests where the slope is gentle with verdant vegetation and good forests round about, the landscape is generally pleasing.

Forest plays a significant role in the livelihood of forest dependents particularly to indigenous tribal people, who are residing in the forests. Since long back tribal people are residing in the forest, have few livelihood options other than hunting animals in the forest and the collection of NTFPs for their food, medicines and income (FAO 1995, Falconer 1996 and Ros-Tonen 1999). These days' forest products such as timbers and non-timbers have a greater role in the livelihood of tribal people from all over the world. NTFPs are internationally known as Non-Wood forest products (NWFPs) include all biological materials, other than timber, are extracted from forests and used as food and food additives (fruits, edible nuts, mushrooms, , herbs, spices and condiments, aromatic plants, game), fibers (used in construction, furniture, clothing or utensils), resins, gums, and plant and animal products used for medicinal, cosmetic or cultural purpose for human use (FAO 1999, Khanal 2006). Historically, the tribes in the district were depending on forest products for their livelihood and also for medicines (Saxena, 1995). In recent years, the practice of collection of forest products is slowly vanishing at a faster rate due to rampant deforestation and the displacement of the tribal from the traditional habitats (Kennedy, 2006). Tribal people collect NTFPs irrespective of their income level (Verma and Paul, 2016) and the income contribution of NTFPs to total income varies across ecological settings, sessions, income level, etc. (Pandey, et al., 2016). The medicinal plants of NTFPs have remained as an important source of traditional medicines in various nations like Indian Ayurveda, Chinese, Unani, Siddha, Tibetan, etc. (GoI, 2000).

The World Health Organization estimated that about 80% of the population of the developing countries uses NTFPs to meet their health and nutritional needs (Olaniyi et al., 2013). Additionally, several opportunities for improved rural development and standard of living are linked to NTFPs (Ajake and Enang, 2012; Islam et al., 2013). NTFPs are in daily use throughout the tropics, commonly providing resources crucial to people where no other social security is provided by the state (Bharathkumar et al., 2011).

NTFPs play prominent roles in improving living standards through variant socioeconomic services such as source of food to households, income generation potentials, provision of safety-net or insurance in times of a tragedy, preservation of cultural heritage and spirituality and financial saving by households (Shackleton and Pandey, 2014).

India has about 16000 plant species; of which 3000 yield NTFPs providing 40% of forest revenues and 55% forest based employment (Shit and Pati, 2012). According to World Resource Institute, over 500 million people in India are dependent on NTFPs for their subsistence and cash income (Sarmah and Arunachalam, 2011). The income from sale of the NTFPs for households living in and around forest constitutes 40 to 60% of their total income (Nayak et al., 2014). NTFPs are not only a source of subsistence income for millions of poor households but also provide employment to rural poor in the form of direct employment, self-employment and secondary employment (Prasad and Siddiqui, 2006). Livelihood contribution of NTFPs to rural households is uneven because it depends on diversity and availability of NTFPs, proximity to forest, family labour, marketability of the resources, extent of

rights and concessions conferred etc. (Melaku et al., 2014). NTFPs based livelihood systems vary considerably between different regions and among the various ethnic groups, depending on ecological, historical, cultural, geo-climatic factors in India (Tewari, 2014).

A large number of different indigenous communities in this region are traditionally dependent on forest products, especially on NTFPs, which play a significant role in the maintenance of subsistence and provision of food and medicine. It is estimated that 60–94% of the tribal population in states like Arunachal Pradesh, Nagaland, Manipur, and Tripura are dependent on forest resources for various purposes (Datta gupta and Gupta 2016)

In the recent decades, there has been growing interest in the contribution of non-timber forest products (NTFPs) to livelihoods, development, and poverty alleviation among the rural populace. This has been prompted by the fact that communities living adjacent to forest reserves rely to a great extent on the NTFPs for their livelihoods, and therefore any effort to conserve such resources should as a prerequisite understand how the host communities interact with them.

The Shivpuri district is the largest and the biggest forest, various plant species and Madhav National in India. For many years, some indigenous tribal people were living within the forest and fully depending on the forest for livelihood. The dominant tribes such as Sahariya, Bheel, are involved in the collection of NTFPs in this area (Jain, S.K, 2010). Since it's become a protected area, many tribal people are displaced outside the forest and there are banned on the collection of forest products (timber as well as non-timber). They are very few studies have been made on the livelihood of tribal people in the Shivpuri district area but none of the studies have examined the economic role of NTFPs in the livelihood of Sahariya tribal. Therefore, this study has made an attempt to examine the economic role of NTFPs in the livelihood of Sahariya and Bheel tribal people in the Shipvuri district.

Forests provide products for different uses at households and industrial levels (Appiah 2009). These products are grouped into timber and non-timber products (NTFPs). Furthermore, the importance of NTFPs in household income is not well known due to the absence of a systematic and rigorous data collection system at national level in many developing countries (FAO 2012).

Forest resources, particularly the non-timber forest products (NTFPs) have been established as an essential source of livelihood for the majority of forest dependent communities among others. This study aimed at assessing the forest-people relationship in terms of the contributions of NTFPs to household's livelihoods and incomes; an important parameter that may guide policy formulation, practice, and management.

Understanding the livelihood dependency on NTFPs among Sahariya tribal communities in rural areas can help policy makers design and implement effective strategies for poverty alleviation, livelihood improvement, conservation and sustainable NTFPs use. With this background the current research is contemplated to quantify and analyze the diversity of NTFPs and its livelihood contribution to the tribal households of Chitorikal villages in Shivpuri district in Madhya Pradesh.

Material and Method:

They collect NTFPs without permission from the forest department, therefore, at first they hesitate to answer the questionnaire method. Then the data has been collected with informal and open ended questionnaire. The study selected villages are Chitorikal. The selected study villages as well as the number of population size are very small and scattered, the data have been collected randomly as all the households are involved in the collection of NTFPs. Total 228 samples were collected from the selected

villages but after the removal of 28 irrelevant questionnaires, the total 200 samples are used in the data analysis.

Multistage sampling technique was used for the study. A representative sample of 400 household's was used to explore the utilization of NTFPs and their contribution to households' income in communities proximate to Madhav National park and around the Chitorikala village. Descriptive statistics and logistic regression analysis were used to analyze and summarize the data collected.

Results and Discussion-

The present study reveals that a good number of villagers and local people have knowledge of exploring NTFPs as about 30% of their income is generated from the collection of NTFPs while 60% from agriculture and remaining 10% from other sources. The people in majority prefer to collect the NTFPs having high prices. They obtain tentative prices of the NTFPs and their market demand from the traders and local shopkeepers. It was also observed that mostly poor and unemployed people collect and sell NTFPs in large quantities. They retain large part of the produce for their own use and sell remaining part in the market. The income generated by the sale of NTFPs is utilized for buying clothes, salts and other necessary items. The collectors mostly recognize NTFPs by leaves, flowers or by smelling.

In the presented study the major plants and products obtained from them under non-timber forest products found in forests have been listed in the following Table-1

Tale-1

Non Timber Forest Product and Socio-economic important plant species of the forest of Shivpuri district

S.No.	Plant species	Local Name	Economic importance and use
	Building Material		
1	*Bambusa indica (Willd.)*	Bans	Bamboo is a primary used in construction materials and secondary used as - Making the Mate, Basket, Broom and Suph. Other uses as Handloom and Handicrafts, Weapons, Hunting and Fishing.
2	*Butea monosperma (L.)*	Palas	Palas roots used in Cordage.
3	*Lantana whitiana (L.)*	Bhoomdi	This plant used for surrounding the home protection.(Fancing)
	Fire wood		
1	*Azadirecta indica L.*	Neem	Used as fire wood.
2	*Acacia nilotica (L.)*	Babul	Used as fire wood.
3	*Parkinsonia aculeata (L.)*	Kikar	Used as fire wood.
4	*Albizia lebbek L.f.(Benth.)*	Siris	Used as fire wood.
5	*Alangium salvifolium (L.f.)*	Akol	Used as fire wood.
6	*Butea monosperma (L.)*	Palas	Used as fire wood.
7	*Acacia leucophloea (Roxb.)*	Remja	Used as fire wood.
8	*Madhuca indica(L.)*	Mahua	Used as fire wood.
9	*Prosopis juliflora, D.C.*	Vilayti babul	Used as fire wood.

	Furniture wood		
1	*Shorea robusta(L.)*	Saal	Used as Furniture wood.
2	*Tectona grandis (L.)*	Sagon	Used as Furniture wood.
3	*Acacia nilotica (L.)*	Babul	Used as Furniture wood.
4	*Azadirecta indica L.*	Neem	Used as Furniture wood.
5	*Dalbergia sissoo (Roxb.)*	Sisam	Used as Furniture wood.
6	*Grewia tiliaefolia (Vahl.)*	Dhaman	Used as Furniture wood.
7	*Eucalyptus citridora (L.)*	Safeda	Used as Furniture wood.
8	*Ficus recemos (L.)*	Gular	Used as Furniture wood.
	Food material		
1	*Artocarpus heterophyllus (Lam.)*	Kathal	Fruit are used in edable.
2	*Amaranthus viridis (L.)*	*Chulai*	Edible Leaves.
3	*Carissa spinarum (L.)*	Karonda	Edible fruit.
4	*Cassia tora (L.)*	*Puanr*	Edible Leaves.
5	*Chenopodium album (L.)*	*Bathua*	Edible Leaves.
6	*Limonia acidissima (L.)*	Kaitha	Edible fruit.
7	*Madhuca indica(L.)*	Mahua	Edible fruit.
8	*Mangifera indiaca (L.)*	Aam	Edible fruit.
9	*Manilkara hexandra (Roxb.)*	Khirni	Edible fruit.
10	*Moringa oleifera (Lam.)*	Sejna	Edible Pods.
11	*Phoemix dactylifera (L.)*	Khajoor	Edible fruit.
12	*Pithecellobium dulce(Roxb.)*	Jangle jalebi	Edible fruit.
13	*Solanum nigrum(L.)*	Makoi	Edible fruit.
14	*Syzygium cumini (L.)*	Jamun	Edible fruit.
15	*Tamarindus indica, (L.)*	Imli	Edible fruit.
16	*Terminalia bellarica(L.)*	Baheda	Edible fruit.
17	*Terminalia chebula (L.)*	Harra	Edible fruit.
18	*Zizpyus nummularia (L.)*	Ber	Edible fruit.
	Fodder		
1	*Andropogon annulatum(L.)*	Ghass	Used as fodder.
2	*Apluda varis (Hack.)*	Phulera	Used as fodder.
3	*Butea monosperma (L.)*	Palas	Used as fodder.
4	*Cymbopogon martini, Wats.*	Rusa/lamen grass	Used as fodder.
5	*Cynodon dactylon (L.)*	Doob	Used as fodder.
6	*Euphorbia hirta (L.)*	Dhudhi	Used as fodder.
7	*Ficus recemos (L.)*	Gular	Used as fodder.
8	*Ficus religiosa (L.)*	Pipal	Used as fodder.
9	*Heteropogon contortus (L.)*	Lampa ghass	Used as fodder.
10	*Themeda quadrivalvis O.kuntz*	Gunher	Used as fodder.
11	*Trifolium alxandrinum (L.)*	Barseem	Used as fodder.
12	*Zizpyus nummularia (L.)*	Ber	Used as fodder.

	Agriculture use		
1	*Bambusa indica (Willd.)*	Bans	Agricultured instrument.
2	*Acacia nilotica (L.)*	Babul	It bull cart.
3	*Lawsonia iermis (L.)*	Mahandi	Field boundary. (Fancing)
	Religeous important plants		
1	*Aegle marmelos (L.)*	Belpatri	Religeous use.
2	*Bauhinia malabarica, Roxb.*	Aamta	Religeous use.
3	*Butea monosperma (L.)*	Palas	Religeous use.
4	*Ficus benghalensis (L.)*	Bargad	Religeous use.
5	*Mangifera indiaca (L.)*	Aam	Religeous use.
6	*Phyllanthus embllica (L.)*	Amla	Religeous use.
7	*Bryonia laciniosa (L.)*	Shivlingi	Religeous use.
8	*Cynodon dactylon (L.)*	Doob	Religeous use.
9	*Datura metel (L.)*	Kala Datura	Religeous use.
10	*Ocimum basilicum (L.)*	Tulsi	Religeous use.
11	*Saccharum spontaneurm*	kus kus	Religeous use.
	Instruments		
1	*Bambusa indica (Willd.)*	Bans	This is used in musical instrument making as- Flute, Chilgoja.
2	*Morus alba (L.)*	Sahatut	Used for making musical Instruments.
	Oil Production		
1	*Pongamia pinneta*	Karanj	Oil production.
2	*Ricinis communis (L.)*	Arandi	Oil production.
	Medicinal Seeds		
1	*Cassia tora L.*	Puanr	Medicinal use.
2	*Cassia fistula, (L.)*	Amaltas	Medicinal use.
3	*Datura metel (L.)*	Kala Datura	Medicinal use.
	Beverage		
1	*Madhuca indica(L.)*	Mahua	Beverage industry.
2	*Tamarindus indica, (L.)*	Imli	Beverage industry.
	Bidi Industry		
1	*Diospyros melanoxylon (Roxb.)*	Tendu	Leaves are used making in Bidi.
	Sericulture		
1	*Zizpyus nummularia (L.)*	Ber	Sericulture.
2	*Albizia lebbek L.f.(Benth.)*	Silk tree	Sericulture.
3	*Morus alba (L.)*	Sahatut	Sericulture.
	Honey Production		
1	*Azadirecta indica L.*	Neem	Honey bee hive.
2	*Ficus religiosa (L.)*	Pipal	Honey bee hive.
3	*Zizpyus nummularia (L.)*	Ber	Honey bee hive.
4	*Syzygium cumini (L.)*	Jamun	Honey bee hive.
5	*Acacia nilotica (L.)*	Babul	Honey bee hive.

	Medicinal uses		
1	*Gloriosa superba L.*	Kalihari	Medicinal use.
2	*Jatropha curcas L*	Ratanjot	Medicinal use.
3	*Xanthuim strumarium L.*	Gokharu	Medicinal use.
4	*Tinospora cordifolia L.*	Giloy	Medicinal use.
5	*Terminalia bellarica (L.)*	Baheda	Medicinal use.
6	*Terminalia arjuna (roxb.)*	Arjuna	Medicinal use.
7	*Sphaeranthus indicus (L.)*	Gorkhmundi	Medicinal use.
8	*Sida acuta (L.)*	Bala	Medicinal use.
9	*Adhatoda vasica, Ne*	Adusa	Medicinal use.
10	*Acacia catechu, (Roxb.)*	Khair	Medicinal use.
11	*Lawsonia iermis (L.)*	Mahandi	Medicinal use.
12	*Aloe vera (L.)*	Gavarpata	Medicinal use.
13	*Buchnania lanjens, Sprang.*	Achar	Medicinal use.
14	*Bacopa monnieri (L.)*	Brahmi	Medicinal use.
15	*Bauhinia varieget, (L.)*	Kachnar	Medicinal use.
16	*Bombex ceiba (L.)*	Semal	Medicinal use.
17	*Bryophyllum calycinum L.*	Patharchatta	Medicinal use.
18	*Azadirecta indica L.*	Neem	Medicinal use.
19	*Gymnosporia montana (Lamk.)*	Baikal	Medicinal use.
20	*Cissus quadrangularis*	Harjod	Medicinal use.
21	*Achyranthes aspera L*	Latjeera	Medicinal use.
22	*Mentha piperita (L.)*	Pudina	Medicinal use.
23	*Glycyrrhiza glabra*	Mulethi	Medicinal use.
24	*Tinospora cordifolia L.*	Giloy	Medicinal use.
25	*Jatropha curcas (L.)*	Ratanjot	Medicinal use.
	Other uses		
1	*Butea monosperma (L.)*	Palas	Plates and cups and beedi wrapping.
	Gum production		
1	*Butea monosperma (L.)*	Palas	Red gum. Red gum of Palash is called **Kamarkas** Which is used to supply calcium to pregnant women and elderly people.
2	*Acacia nilotica (L.)*	Babul	White gum.
3	*Anogeissus latifolia Willd*	Dhaora	Edible gum.
4	*Azadirecta indica L.*	Neem	Brown gum.
	Lac production		
1	*Butea monosperma (L.)*	Palas	Lac culture.

Some ot the important non timber forest products of Shivpuri district forest are Tendu (*Diospyros melanoxylon*) leaves for Bidi industry, Mahua (*Madhuca indica*) Flower for wine industry, Imli (*Tamarindus indica*) Pod for Beverage industry, Khair (*Acacia catechu*) Wood for Kattha industry,

Bamboo (*Bambusa indica*) for Building material, Palas (*Butea monosperma*) root for rope, Bhoomdi (*Lantana whitiana*) stem for Fencing.

Number of economically important plant species has been observed in the forest of Shivpuri district. Rural and Tribal people depend on the forest for their livelihood. They collect Tendu (*Diospyros melanoxylon*) leaves and Mahua (*Madhuca indica*) for forest department on the daily wages. They depend on forest for fire wood and grazing of cattle.

Rural people specially tribes rely on herbal a medicine, which is found in the forest of Shivpuri distrct. Fruits, Flowers, Shoots, leaves, tubers, and roots of many plants are used as edible food. Many cottage industries are based on forest products like gum, Resin, Honey, Herbs, Pickle, and Bidi.

The firewood has been the most important NTFP in an average 150 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 leave.

Conclusion-

From the study of the present presented paper, we find that many variations of plants are seen in Shivpuri district. Sahariya tribals live in the villages around Shivpuri district. Who depend directly and indirectly on the products obtained from forests for their livelihood. Tribal and local residents improve their economic condition by collecting economic and medicinal plants found in the forests.

Tribals (specially Sahariya tribe) and Rural people collect seasonal non timber forest products and sell them in the local markets and earn money for their two ends meet. Most of the forest resources are in the domain of rural and tribal communities. In these remote areas, many economic models have collapsed because of the absence of linkages such as marketing and regular supply of forest products. Forests with rich diversity of vegetation provide a high socio-economic status of the state and rural and tribal communities.

Shivpuri District was heavily forested. Forest cover dwindled over a period of time due to mining, stone quarrying and increased demand for fuel wood in the region. The change in land use pattern, dependency of people on forests, and scarcity of natural resources in this region has caused over exploitation of dense forest. Under these circumstances, it is difficult to sustain livelihood of rural and tribals (specially Sahariya tribe) people without resource enrichment. Now a days, the NTFPs are not easily available in the forests. The collectable quantity of NTFPs is decreasing day by day as compared to past years.

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