



Indigenous Pattern of Collection and Utilization of NWFPs and Socio-Economic Sustainability for Tribal Women of Central Chhattisgarh

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Abstract: Tribal women perform a variety of forest-based functions in their day-to-day activity at different levels but their roles and participation tend to be poorly visible and unacknowledged. Considering women's relationships with collection, utilization and processing they perform significant role and responsibility in sustainable management of NWFPs. The gathering of everyday NWFPs particularly food, medicinal plant parts and craft materials, has always fallen into the domain of women. NWFPs have widespread promotion of these products, particularly by agencies interested in sustainable development, as tools for enhancing livelihood of women. For this purpose, a review study has been conducted by reviewing of 24 relevant Research papers, articles and Forest Department office. As compared to male, female is more compatible for collection of various plant-based medicines from locally available NWFPs which includes more significant, bamboo, tendu, cocoons and mahua and so many other types of locally available known minor forest produces. Providing better support, opportunity, training and documentation on their knowledge would enhance healthcare, food sources, livelihood, involvement of women and socio-economic condition in sustainable NWFPs management.

Keywords: Tribal women, Livelihood, NWFP, Women participation, NWFP

Non-Timber Forest Products (NTFPs) are referred to as Non-Wood Forest Products (NWFPs) by FAO which has been in use since the beginning of a human civilization. In past decades these were called minor forest products due to being an insignificant economic value. According to the Food and Agricultural Organization of the United Nations (FAO), over 80% of people in underdeveloped nations have been found to use plants as a kind of traditional medicine. According to studies, on the use of non-timber forest products (NTFPs) for income production, rural households' income was generated between 20 to 60 percent in 2018-19 (Arularasan et al 2022). However, in now were days these have been spurt in demand because of common acceptance of natural products for medicines, cosmetics, dyes, chemicals, bio-pesticides, food, etc. Over 75per cent of total forest export revenue of India is accounted by NWFPs for local people and such products were always important because they are the providers for year-round source of livelihood. Social researchers and forest managers are now unambiguous about the importance of NWFPs to the living and economy of rural people (Kumar 2019). In central Chhattisgarh, collection of NWFPs consist the main source of wage labor are involved only 19 per cent and 41 percent are involved in NWFP collection as a substitute occupation. In

other studies household income profile from NWFPs collection according to researchers is average as compared to another substitute occupation. From the above analyses it is clear that NTFPs plays a greater role in upgrading the social, economic and traditional lifestyle of forests dependent people particularly the tribals, women's and other rural people (Kumar 2019). The knowledge required for sustainable utilization of plants is often qualitative, based on observation and limited within a particular geographical area and these knowledges were actually accumulated by the tribal peoples and culturally transmitted from their ancestors (Gadgil 1993, Patra 2022).

This study is reviewed to understand the traditional knowledge of tribal women who practices with an emphasis on various collection of NWFPs which are locally available. Specifically, this study also made an effort to understand the support, opportunity and training on their knowledge that how it would enhance healthcare, livelihood and socio-economic condition in sustainable NWFPs management. Further, this study has assessed the role of women participation in NWFPs collection and Utilization.

In central Chhattisgarh, tribal women pursue a variety of income source, with wage labor serving as the essential part with women and men having separate domains of livelihood-

related activities. Cultivating farm vegetables, manufacturing puffed rice, Bamboo crafts, weaving mats, and other similar items are there. Forests have always been a key source of food. The most prevalent source of income was timber trading, which is no longer available, at least legally. Collection and selling of non-timber forest products such as fuel wood viz., *Diospyros melanoxylon* (tendu) and *Shorea robusta* (sal), *Terminalia bellirica* (harra), *Tamarindus indica* (Tamarind), *Buchanania lanzan* (chironjee guthli), *Karria lacca* (lac, Kusumi, Rangini), *Madhuca indica* (Mahua), *Dioscorea bulbifera* (Gethi kanda), leafy vegetables and bamboo are most prevalent activity. Bamboo dead leaves are used to construct mats, which tribal women sell in the local market, in the related communities. Fuel wood, *Diospyros melanoxylon* (tendu leaves) and *Shorea robusta* (sal) leaves, bamboo, and other items are sell by rural people to generate money. In addition, the poor households ate roots and edible leaves obtained from the forest. Many tribals believed that instruction in the processing of forest products like bamboo and dead leaves was necessary. They proposed that more tree plantation in the forest due to heavy depletion and shrinking in size. In Central Chhattisgarh more than 85% of tribal women are involved directly reliant on NTFPs from the nearby forest, while other tribal women rely on NTFPs indirectly, with many households bringing forest products such as fuel wood, mushrooms, and other items as needed. According to Ghosal (2011), particularly the tribal women prefer mixed forests as it provides better support and allowed them to pursue a variety of economic options. Women in India are playing a crucial role in protection and conservation of environment.

Women in our country have brought a different perspective to the environment debate, because of their different experience base (Tiwari 2020). Women have always been the major conservers of bio-diversity. Traditionally, women have been responsible for subsistence and survival for water, food, fuel, fodder and habitat, though they rarely get the credit for nurturing these life support systems. Even today they perform duties such as seed selection, multiplication and conservation (Tiwari 2020).

Therefore, for tribal women major dependency on forest is in NTFPs as a food source and livelihood. Tribal women are getting economic benefits from the forest but in case of mushroom tribal lack behind because mushroom is a seasonal produce and at same time tribals are getting busy in their agriculture fields for crop production and due to which tribal women get less return or income from mushroom. Instead of collecting mushroom at mass level they only collect for their household needs as food option.

MATERIAL AND METHODS

We have collected the data to review from the relevant 24 research papers, articles and data collected from the forest office of Katghora forest division. The data has been collected to understand the indigenous pattern of collection and utilization of NTFPs and their socio-economic sustainability for tribal women of central Chhattisgarh.

RESULTS AND DISCUSSION

Seasonal NTFP collection: An interactive tool to explore the seasonal collection is a seasonal calendar. Knowing the kind of NTFPs and the month they are obtained is helpful. (Ushadevi et al 2022). The majority of the species may be found in the woodland from April to December. In general, tribal women and their children are active in the harvesting of NTFPs from the forest. *Shorea robusta* (Sal) leaves are harvested virtually all year, especially for use in plate manufacturing. The main season, however, is from September through November. Despite the fact that *S. robusta* (sal) leaves are abundant in the forest during the rainy season, they are rarely collected due to rice farming. Similarly, firewood is collected all year, but it is plentiful after the winter. Mushroom harvesting is limited to the late monsoon season, which runs from June to September. At the same time, tubers are harvested. One- or two-months following spring, Tendu leaf collection is prohibited. After the monsoon season, grass is grown and collected. Farmers harvest grass once or twice in the same year from the same plots of land, depending on the grass's development. The harvesting season begins in late August and lasts until the end of December. Few studies have looked at the significance of when NTFPs are collected, although it can have an impact on how useful they are as a source of revenue (Toda et al 2023).

The locals tribal people harvest NTFPs not only in the protected forests, but also in the settlements' surrounding areas. Tribals leave early in the morning to collect firewood. Tribal women are occasionally not able to gather sufficient amount of fuelwood due to which as a result tribal women enter to the deep forest. Travelling long distances inside the deep forest and return at the end of the day after gathering sufficient amount of fuel wood. Bamboo shoots, mushroom and tuber fruits are used as vegetables. Mat weaving is also done by tribal people with palm leaves and bamboo stems. *Andrographis paniculata* (Kalmegh), *Asparagus racemosus* (Satmul), *Aristolochia indica* (Ishwarmul), *Hemidesmus indicus* (Anantamul), and other therapeutic herbs are employed. Basket weaving is done with Dudhilata stems.

Table 1 shows various NTFPs collection done by tribals in central Chhattisgarh and the selling price of NTFPs per kg.

Various species mentioned in the table are collected in the priority basis and depend on the demand of the species and in the Figure 1. This shows mostly tendu and mahua are collected by the tribals. Only young people can actively collect NTFPs, probably due to collection sites are far from the village area and it is challenging for elderly persons to go about in forested areas. NTFPs are crucial for low-income households, and that's the reasons why the village youth are more interested and active for collection of NTFP as they can increase their incomes through the sale of NTFPs. (Bagal 2022). The tribal uses mostly the fruit portion of various NTFPs out of all those collections. From the present study, it can be inferred that the gathering, consumption, and sale of NTFPs are important for ensuring the tribal population's livelihoods in central Chhattisgarh. (Gupta 2017)

Socio-economic sustainability: Tribal women are directly dependent on NTFPs which are collected from the local

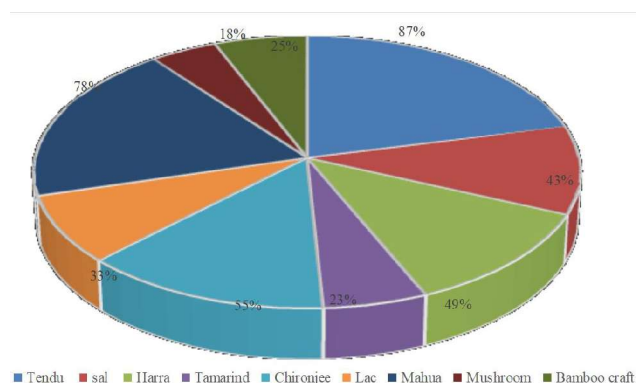


Fig. 1. Major collection of NTFPs by Tribals

Table 1. List of NTFPs collection in central Chhattisgarh

Common name	Scientific name	Family	Flowering	Fruiting	Harvesting	Selling price/kg
Tendu	<i>Diospyros melanoxylon</i>	Ebenaceae	April- May	May- June	June	-
Sal	<i>Shorea robusta</i>	Dipterocarpaceae	April- May	May	May- June	20.00
Kusum	<i>Schleichera oleosa</i>	Sapindaceae	January- February	March- April	July- August	23.00
Bahera	<i>Terminalia bellirica</i>	Combretaceae	April-May	May	November-February	17.00
Imli	<i>Tamarindus indica</i>	Fabaceae	April-June	February-March	March-April	36.00
Chironjii	<i>Buchanania lanzan</i>	Anacardiaceae	January-February	March-April	April-May	126.00
Mahua	<i>Madhuca indica</i>	Sapotaceae	March-April	April	May-June-July	29.00
Kalmegh	<i>Andrographis paniculata</i>	Acanthaceae	March- April	March- April	September	35.00
Charota	<i>Cassia obtusifolia</i>	Fabaceae	March- September	May- September	November	16.00
Harra	<i>Terminalia chebula</i>	Combretaceae	April- May	May- June	November- February	15.00
Van tulsi	<i>Ocimum gratissimum</i>	Lamiaceae	-	-	-	16.00
Honey	-	-	-	-	October/ November and February- June	225.00
Shatavari (roots)	<i>Asparagus racemosus</i>	Asparagaceae	July	September	November- December	107.00
Shikakai	<i>Acacia concinna</i>	Mimosaceae	October- November	December- January	April- May	50.00
Nagarmotha	<i>Cyperus rotundus</i>	Cyperaceae	March- July	July-September	October- November	30.00
Kusumi (Lac)	<i>Kerria lacca</i>	Kerridae	-	-	-	300.00
Rangini (Lac)	<i>Acacia catechu</i>	Fabaceae	March- September	March- September	March- September	220.00
Giloy	<i>Tinospora cordifolia</i>	Menispermaceae	May- June	September- October	November	40.00
Bhelwa	<i>Semecarpus anacardium</i>	Anacardiaceae	December- January	February- May	May- June	09.00
Dhawai (Flower)	<i>Woodfordia fruticosa</i>	Lythraceae	February- April	April- May	May	37.00
Kullu gond	<i>Sterculia urens</i>	Sterculiaceae	December- March	April- May	April- June	125.00
baelguda	<i>Aegle marmelos</i>	Rutaceae	March-April	April- June	April-May	30.00
Karanj	<i>Millettia pinnata</i>	Fabaceae	April-June	May- June	November- December	22.00
Neem	<i>Azadirachta indica</i>	Meliaceae	April	June- July	July- August	27.00
Jamun	<i>Syzygium cumini</i>	Myrtaceae	March- May	May- June	July- August	42.00

Source: Kendai Forest Range office of Katghora Forest Division

forest areas, while the rest tribal women indirectly use the resources by buying forest products such as fuelwood and mushroom according to their needs. Tribal women collect NTFP like fuel wood, *Diospyros melanoxylon* (tendu) and *Shorea robusta* (sal), *Terminalia bellirica* (harra), *Tamarindus indica* (Tamarind), *Buchanania lanzan* (chironjee guthli), *Karria lacca* (lac, Kusumi, Rangini), *Madhuca indica* (Mahua). Out of which fuelwood is the most important one which is frequently collected. All tribals including male, female children they together contribute for collection of NTFPs, but the contribution from female tribals women is high. NTFPs play a vital role in supporting livelihoods in rural household community (Adhikary et al 2021). The tribal women livelihood activities of their households include crop productivity, livestock productivity, harvesting of Non-wood Forest Produces and other activities. The contribution of NTFPs to household earnings can be influenced by a wide range of circumstances. It's probable that NTFP dependence is higher among the impoverished than among the wealthy. (Lepcha et al 2022). However, the main source of income is agriculture field i.e. crop and livestock productivity and collection of NWFPs. People residing near the natural forest are depend on it for acquiring many NWFPs and timber. Although NTFPs play a vital role in rural income and employment, most tribal members only collect NTFPs from the forest on a monthly basis. Just a small number of tribal members gather NTFPs on a daily basis. (Das et al 2020). The major NWFPs, namely *Diospyros melanoxylon* (tendu) and *Shorea robusta* (sal) leaves, *Dioscorea bulbifera* (Gethi kanda), mushroom, housing materials, sal gum, sal seed play an important part in their household income. This means income of tribal women is contributed from NTFPs and NWFPs to their annual household income in the production and according to tribals agriculture is contributed slightly more than NTFPs and NWFPs (Melaku et al 2014). The level and pattern of NTFP dependency among people living near forests is influenced by various socioeconomic factors (Kar et al 2012). Therefore, tribal women are getting financial benefits from NTFPs and their knowledge related to wild fruits, food, medicines, NTFPs, forest status and conditions are high as they are more frequent visitors in the forest. Tribal women's knowledge benefits them in raising income but there are some limitations due to social structure they face the gender discrimination which negatively influence their value and role in the participation.

Role of women participation in NTFP management: The role of women's participation in NTFP activities cannot be overstated, women are primary driving force in the amount of collection and use of NTFP both of which contribute to their well-being. Women are also the active users and members of

most of the community forests (Tiwari 2015). It is advised that agricultural advisory and extension services are the terms of NTFPs collection and utilization which is extended to tribal women, as involvement in crop production and agriculture is related to NTFPs utilization. Also, primary occupation of tribals is farming but by conducting various programs and making policies will increase women's participation in farm and off-farm activities and since income was positively related to NTFPs utilization, cash transfers and other forms of assistance should be provided. Also, required roadways that will assist access to forests as well as the market should be restored or built, since this will increase the sustainable use of NTFPs. It offers a potentially priceless contribution to stable economic conditions (Kaushik 2022). Also, because NTFPs use has a significant impact on well-being, rural women should be provided with extension services on how to use them effectively (Rout 2010); developing various roadways connections that connect rural communities to the nearest markets and forests should be made, as this will facilitate transportation of NTFPs from forests areas to different markets and will improve their lifestyle and facilitating credit access for rural women should be done, as this will help them expand their capital and improve their well-being. Given that the use of NTFPs benefits to women's well-being, policies and programmers aimed at increasing women's use of NTFPs should be implemented.

Sustainable management: Forest resources are in the form of NTFPs which serve a vital role in safeguarding forest inhabitants' socioeconomic and ecological safety nets. Due of its abundance in the forest, people are less aware of the need to preserve it through selective and non-destructive harvesting. (Lestari et al 2023). However, there are currently insufficient instruments and tactics available to effectively control trade, devise development strategies, and promote the sustainable use of NTFPs. In the upcoming years, it will be difficult to build the proper tools and processes for regulating NTFP trading and extraction. (Gopinath et al 2022). According to the findings, practically all forest residents rely on forest products other than timber to varied degrees. By addressing people's socioeconomic, ecological, cultural, and spiritual requirements at the local, national, and global levels, sustainable forest management (SFM) enhances human well-being. In order to promote local livelihoods, integrated SFM increases the value of forests and preserves or improves other significant local or global ecosystem services. Broad environmental and socioeconomic goals should serve as the basis for forest management, which should then use ecosystem-based approaches (EbAs) to manage the entire ecological system in a comprehensive and integrated way. (Kumar et al 2022).

Implementation of sustainable harvesting techniques at the correct time of harvest demonstrated favorable effects on resource preservation, community socioeconomic position, food quality, and financial gains. Our study clearly shows that NTFPs with higher demands are those that are harvested sustainably at the proper stage of maturity (Pandey et al 2016).

For communities in tropical areas, particularly for underdeveloped rural communities, the provision of wild non-timber forest products (NTFPs), such as food, medicines, and cultural ornaments, constitutes an important ecosystem service (Ros-Tonen and Wiersum 2005, Timko et al 2010, Shackleton and Pandey 2014, Van Andel et al 2015, Shackleton et al 2018). For the conservation of tropical NTFPs, a deeper knowledge of the connections between NTFP abundance and plant diversity is crucial because it can be used to find areas where the supply of NTFPs and current efforts to conserve biodiversity can work together, as well as to develop new conservation strategies. (Steur et al 2021). The social sustainability of a system is determined by the motivation of the people involved. Forest department make "Forest Protection Committees" (FPC), and these committees make choices for the diverse challenges that the individuals encounter. Those who make up this society which include women as the weaker sections-the silent groups. Social sustainability is also be recognized, and the societies cultural and structure are protected through significant progress which are accomplished in the district where the tribal communities are motivated for identification with the forest ecosystem where as their intrinsic love and respect for environment which provide us with a solid platform for upliftment and holding the FPC's foundation. As NTFP trade grows, there is a risk of unsustainable exploitation. This problem is made worse by the fact that local communities' ownership and access to NTFPs has rapidly decreased, leaving it as an open-access resource. India's cooperative forest management programmed, in which local people collaborate with the state forest department to share responsibilities and benefits from forests, is a promising step forward. There is little incentive to administer NTFP sustainably unless users are provided access. The close association between women and natural resources is than valid primarily in rural context especially among women of rural areas. For such women the association exists because of their social and economic role which over generations have required them to provide food, water, fuel, fodder and income from surroundings resource base (Saxena 1991). Potentially, one of the most effective and sustainable forest management strategies is the use of NTFPs in forest management and planning (Kargbo et al 2022). Thus,

women are providing an important role in sustainable development of community forests. However, their role is neither properly identified nor explored (Tiwari 2015).

CONCLUSION

Participation of tribal women in social, economic and environmental activities contributes to better sustainable use of the forest resources. Involvement of women in NTFPs collection has a wide range of positive effects. The NTFPs play a vital role in improving livelihoods and satisfying the need and requirement of tribal groups, especially women in the fields of food, medicine, and poverty reduction. Non-Timber Forest Products (NTFPs) are the integral and important parts of the forest-based industry and have been long recognized as vital and viable resources for fostering sustainable livelihoods activities, conservation of resources, and developmental capacity. It is extremely important for tribal women residing in tribal zone particularly for those who are living near the forest areas. As in one hand, systematic NTFPs harvesting will expand employment prospects for them. While on the other hand, it may also lessen their anthropogenic pressure from forest which may be an effective way to address the issue of dry-deciduous forest degradation. The promotion and updating of knowledge of NTFPs for community development specially for women folk for poverty reduction, and livelihood, socio-economic betterment in tribal communities is driven by sustainable collection, use, commercialization and continuous updating of knowledge of tribal women regarding collection, cultivation, processing, value addition and marketing system also.

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