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Original Paper

Minor Forest Produces (MFPs) of Jamtara Forest Division, Jharkhand, India

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Abstract: 136 minor forest produces (MFPs) are documented through a field survey from Jamtara Forest Division (JFD), Jamtara, Jharkhand. It was noticed that most plant parts are used under MFPs belonging to tree species. Most MFPs are utilized in the Kundhit and Nala ranges of the division. Enumerated MFPs should be conserved through sustainable utilization and value addition for upgradation of the livelihood.

Keywords: Forest dependency, Indigenous community, livelihood, plant parts

Introduction

Forests hold immense significance for tribal communities. The livelihoods and cultural interactions of these tribal communities heavily rely on the existence of forests. The symbiotic bond between tribal people and forests encompasses various aspects such as ecosystem preservation, economic sustenance, food security, and social cohesion. Minor Forest Produce (MFP) refers to a wide range of products obtained from forests that are not derived from traditional timber harvesting. These products play a crucial role in the livelihoods of communities around the world, providing valuable resources for food, medicine, crafts, and income generation. Over two billion individuals worldwide reside in forests, relying on non-timber forest products, or MFPs. In India, more than 50 million individuals rely on minor forest produces (MFPs) to sustain their livelihoods and generate income (Pandey *et al.,* 2016). These MFPs contribute to 50 percent of household earnings for 20 to 30 percent of the tribal and rural population. While there is potential for approximately 3000 species of forest products to be beneficial, only 126 have been successfully marketed (Pandey *et al.,* 2016). MFPs originate from a wide range of plant parts and are transformed into an assortment of products like decorative arrangements may include leaves and twigs as constituents; fruits, leafy vegetables, fungi, and juices may be consumed

as food items; wood can be carved or woven into both artistic and functional pieces; and herbal remedies or medicines can be derived from roots, leaves, and bark after undergoing processing. Like timber, MFPs can also undergo additional processing to create products aimed at meeting consumer needs and preferences. Community involvement in the management and utilization of MFPs is crucial for ensuring their sustainable extraction and conservation. Jamtara district, located in the state of Jharkhand, has a population distribution where 90.42% of the total population resides in urban areas, while 9.58% resides in rural areas (Kumar, 2023; Devidas *et al.,* 2023; Mishra *et al.,* 2023). Within the district, there is a presence of 9.21% Scheduled Caste (SC) and 30.4% Scheduled Tribe (ST). Minor forest produces play a significant role in the sustainable management of forests and the livelihoods of local communities in Jamtara Forest Division. They provide important sources of income and food security, especially for marginalized communities that rely on forest resources for their daily needs. Additionally, MFPs contribute to the conservation of biodiversity by promoting the sustainable use of forest resources. They also have cultural and traditional value, as many indigenous communities have relied on MFPs from generations, using them for medicinal purposes, handicrafts, and cultural practices. Moreover, MFPs can contribute to the diversification of rural economies and reduce dependence on single commodities, thereby enhancing resilience and economic sustainability. MFPs have both intrinsic and economic value, supporting the sustainable management of forests, the livelihoods of local communities, and the conservation of biodiversity. To effectively assess and manage these resources, it is essential to have reliable data on the availability, utilization, and sustainability of MFPs. Keeping this in view, an attempt has been made to document the MFPs of JFD to draw attention to their sustainable utilization.

Methodology

The present study was conducted in the Jamtara Forest Division, Jharkhand, India in 2023. The division has four ranges, namely Jamtara, Nala, Kundhit, and Narayanpur. A simple random sampling design was used for the selection of the respondents (Ajinkya *et al.,* 2023). Data and information were collected for this study from both primary and secondary sources (Kumar *et al.,* 2012). The primary data was obtained through rigorous fieldwork, which involved interviews, group discussions, and questionnaire surveys with various stakeholders, including Forest Department staff, villagers, MFP merchants, medicinal plant specialists, and non-governmental organization staff members. The selection of villages and households was done using a random sampling technique (Kumar & Devidas, 2023). The data collected included information on MFPs and their quantities, together with demographic information of the collectors (Working Plan of Jamtara Forest Division, 2012; Saha *et al.,* 2022; Agarwal *et al.,* 2023; Dimri *et al.,* 2024).

Results and discussion

Authors have documented the MFPs of JFD which will be helpful in gathering information on traditional knowledge and experience in harvesting and managing MFPs. It can provide valuable insights into the cultural significance and management practices associated with MFPs (Kumar & Kumar, 2020; Kumar *et al.,* 2021; Kumar *et al.,* 2022; Rout *et al.,* 2023).

The authors have enumerated 136 minor forest produces (MFPs) that are used by the rural and tribal communities in JFD for various aspects. Table 1 presents the availability of MFPs in JFD, and their parts, which includes 48 trees, 35 herbs, 10 climbers, 4 wild edible mushrooms, 6 grasses, 6 fishes, etc (Figure 1). There are some descriptions of the availability of MFPs in study areas under the following headings:

Leaves: The leaves of sal (*Shorea robusta*), patal apata (*Bauhinia vahlii),* tiril (*Diospyros melanoxylon),* and sasa (*Semecarpus anacardium)* have high demand for making good-quality leaf plates and are used for eating food by the communities. Nevertheless, these objects are commonly employed in domestic settings rather than by industries that prefer plates. The leaves of Tiril have high economic value because of their use in rolling bidi. Except for this, the leaves of *Enhydra fluctuans* (Hencha ala), *Commelina benghalensis* (Kaana ala), *Ipomoea aquatica* (Kalama ala), *Bauhinia purpurea* (Singh ala), *Rotala rotundifolia* (Cheuri ala), etc. are used as leafy vegetables. Leaves of neem, banana, tulsi, etc. are used for medicinal purposes. Likewise, the leaves of Karanj and Sinuar are used as biopesticides. Some are also used for cultural purposes (Table 1).

Flowers: The study area witnesses a large-scale collection of mahua flowers. The mahua tree plays a vital role in the socio-economic and cultural existence of tribal communities, with each element of the tree (ranging from wood, seeds, leaves, food, liquor, and shade) being utilized by forest-dwelling individuals in their daily lives. However, the flowers are primarily used to produce liquor, leading many people to choose selling them rather than keeping them for personal use at home. The flowers of neem, jirhul, and bandar lathi are also used as vegetables. The flower of sal has its own importance in the festivals of tribes like Baha Bonga.

Fruits: Fruits like aam, imli, chironji, harra, baheda, and aonla hold immense importance. The market demand for all these fruits is significant. Collectors primarily rely on the sale of these fruits as their major source of income. On the other hand, the fruits of mahua and semal are used as vegetables. Raw fruits like kusum, jamun, uli rama janum, janum, etc. are edible.

Seeds and seed oil: Seeds and seed oil are also a main MFP for the tribals. Seeds like sal, kusum, karanj, and malkangani are major ones. The seed oil of neem, karanj, and malkangani is used for medicinal purposes. Kusum and sal seed oil are used for cooking. However, the burnt seed of *Bauhinia vahlii* is edible.

Roots and tubers: The tubers of *Dioscorea bulbifera, Dioscorea puber, Amorphophallus paeoniifolius,* etc. are used as vegetables, and tubers like *Pueraria tuberosa* (Vidari kand) have been used for medicinal purposes.

Stem and bark: The bark of *Soymida febrifuga* (Rakat rahda), *Terminalia arjuna* (Arjun), etc. is used as medicine. The bark of *Bauhinia vahlii* is used in making ropes. The stems of karanj, neem, sal, and baghrandi are used as tooth brushes to make teeth clean. The stem sap of *Phoenix sylvestris* (Khajur) is used as country liquor, locally known as Tadi.

Gums and resins: The major gums produced from the study area forest are from sal (*Shorea robusta*), locally known as dhumna, used as incense, especially in religious ceremonies, and having medicinal properties. A better quality of lac is also made from the resin of kusum.

Table 1: Minor Forest Produces of Jamtara Forest Division, Jharkhand, India

Name	Local name	Parts used	Uses
MFPs with multiple uses			
Aegle marmelos	Bael	Leaves	Leaves are used for worship of Lord Shiva.
		Fruits	Fruits are edible and having medicinal properties.
Antidesma bunius	Matha ala	Leaves	Tender leaves are used as vegetable and the dried leaf powder is used in curry.
	Matha billi	Fruits	Fruits are edible.
Azadirachta indica	Neem	Leaves	Leaves are used for medicinal purposes.
		Flowers	Flowers are used as vegetable.
		Stem	Stem is used to clean the teeth.
		Seeds	Seed oil is used for medicinal purposes.
Bambusa bambos	Kardi	Young shoot	The bamboo shoot is used as a vegetable by the locals in a variety of recipes.
	Bans	Bamboo pole	Used to make different household products and used in agriculture.
Bauhinia vahlii	Patal pata	Leaves	Leaves are used to make leaf plates.
		Stem bark	Stem bark is traditionally used for making ropes.
		Seed	Burnt seeds are edible.
Cassia fistula	Bandar lathi/ Nuluii	Seed	Seeds are collected for medicinal purposes.
		Flowers	Used as vegetable.
Diospyros melanoxylon	Tendu/ Tiril	Fruits	Fruits are edible.
	Tiril pata	Leaves	Leaves are used to make leaf plates and bidi.
Ficus religiosa	Hesa ala	Tender leaves	Used as leafy vegetable.
	Hisah billi	Fruits	Fruits are edible.
Madhuca longifolia	Mahua	Flowers	Flowers are used to make country liquor.
		Fruits	Fruits are used to prepare vegetable.
		Seeds	Seed oil is used as vegetable oil and for medicinal purposes.

Mangifera indica	Aam	Fruits	Fruits are edible.
		Leaves	Leaves are used for religious purposes and fodder for cattle.
Phoenix sylvestris	Khajur	Fruits	Fruits are edible.
		Stem sap	Stem sap is used as country liquor.
Pongamia pinnata	Karanja	Seeds	Seed oil is used for medicinal purposes.
		Stem	Stem is used to clean the teeth.
		Leaves	Leaves are used to make biopesticide.
Schleichera oleosa	Kusum	Fruits	Fruits are edible.
		Seed	Seed oil is used for cooking and traditionally used to cure of skin diseases.
		Gum	Gum is used to make lac.
Semecarpus anacardium	Sasa/ Bhelwa	Fruits	Fruits are edible.
		Leaves	Leaves are used to make leaf plates.
Shorea robusta	Sal	Leaves	Leaves are used to make leaf plates and dried leaves are used as fuel for cooking.
		Flowers	Flowers are used for religious purposes.
		Stem	Stem is used as fuel and used as toothbrush.
		Seeds	The seed oil is extracted from the seeds and used as cooking oil.
	Dhumna	Resin	Resins are used as incense especially which is burnt in religious ceremonies and having medicinal properties.
Woodfordia fruticosa	Dhawai phool	Flowers	Flower juice is edible.
		Root	Roots are used to make country liquor.
MFPs with single use			
Abroma augustum	Ulat Kambal	Fruits	Fruits are collected for medicinal uses.
Achyranthes aspera	Chirchiri	Leaves	Leaves are used as leafy vegetable.
Aerva lanata	Lapong saag	Leaves	Leaves are used as leafy vegetable.
Alangium salviifolium	Dhela	Fruits	Fruits are edible.
Alstonia scholaris	Chatni	Bark	Bark is collected for medicinal uses.
Alternanthera sessilis	Gurundi Ala	Leaves	Used as leafy vegetable.
Amanita egregia	Bada chati	Mushroom	Having food values.
Amaranthus viridis	Leper ala	Leaves and young shoots	Used as leafy vegetable.

A. spinosus	Janum leper ala	Leaves and young shoots	Used as leafy vegetable.
Amorphophallus paeoniifolius	Ban ool	Corm	Corm are used as vegetable.
Andrographis paniculata	Kalmegh	Whole plant	The plant having medicinal properties, used to treat fever, malaria, diabetes, and skin diseases.
Aristida setacea	Khadang ghas/ Balki	Whole plant	Dry grasses are used to make broom.
Artocarpus heterophyllus	Kathal	Fruits	Fruits are edible.
A. lacucha	Dabu	Fruits	Fruits are edible.
Asparagus racemosus	Satavar	Roots	Roots having medicinal properties.
Astraeus hygrometricus	Rutka	Mushroom	Having food and medicinal values.
Barytelphusa cunicularis	Katkom	Mushroom	Used as food.
Bauhinia purpurea	Shing ala	Leaves and flowers	Used as leafy vegetable.
Boerhaavia diffusa	Satha ala	Leaves	Used as leafy vegetable.
Bombax ceiba	Semal	Tender fruits	Used as vegetable.
Borassus flabellifer	Talibili	Fruits	Fruits are edible.
Bridelia retusa	Kadru	Fruits	Fruits are edible.
Buchanania lanzan	Pyarbeej	Fruits	Fruits are edible.
Celastrus paniculatus	Malkangani seed	Seeds	Seed oil having medicinal uses.
Celosia argentea	Sirguti ala	Leaves	Used as leafy vegetable.
Centella asiatica	Rote ala	Leaves	Used as leafy vegetable.
Chrysopogon aciculatus	Jhar gunda	Whole plant	Dry grasses are used to make broom.
Cissampelos pareira	Kidoo ala	Leaves	Used as leafy vegetable.
Colocasia esculenta	Kachu	Leaves	Leaves are used as leafy vegetable.
Commelina benghalensis	Kaana ala	Leaves	Used as leafy vegetable.
Cordia obliqua	Vuch latha	Fruits	Fruits are edible.
Crotalaria juncea	Jirin	Flowers	Flowers are used as vegetable.
Cynodon dactylon	Doob ghas	Leaves	Leaves are used in rituals.
Dentella repens	Kanta ala	Leaves	Used as leafy vegetable.
Dillenia aurea	Rai	Flower	Flower and Flower bud are used as vegetable.
Dioscorea bulbifera	Sang	Tuber	Boiled or burnt tubers are edible.
D. puber	Kukuai sang	Tuber	Boiled or burnt tubers are edible.
Enhydra fluctuans	Hencha ala	Leaves	Used as leafy vegetable.
Entada rheedii	Gila	Seed	Seeds are collected for it medicinal uses.
Eulaliopsis binata	Bobai ghas	Whole plant	Traditionally used it to make rope.
Ficus benghalensis	Badi billi	Fruits	Fruits are edible.
F. hispida	Dumer/ loa	Fruits	Fruits are edible.

F. racemosa	Anjer	Fruits	Fruits are edible.
F. virens	Putkal	Young leaves	Used as leafy vegetable.
Filopaludina bengalensis	Rokoi	Small snail	Used as food.
Flacourtia indica	Pada	Fruits	Fruits are edible.
Gudusia chapra	Khairi	Fish	Used as food.
Helicteres isora	Mudika	Fruits	Fruits are collected as a medicine.
Hemidesmus indicus	Anantmul	Roots	Used as medicinal agent.
Holarrhena pubescens	Indrajau	Bark	Used as medicinal agent.
Honey	Madhu	Honey	Used as food.
Indigofera cassioides	Jirhul	Flower	Flowers are used as vegetable.
Ipomoea aquatica	Kalama ala	Leaves	Used as leafy vegetable.
Jatropha curcas	Baghrandi	Stem	Stem is used as toothbrush.
Labeo bata	Bata mach	Fish	Used as food.
Limonia acidissima	Pinder/ Kath bel	Fruits	Fruits are edible.
Marsilea minuta	Susni saag	Leaves	Used as leafy vegetable.
Mesosphaerum suaveolens	Ban tulsi	Leaves	Leaves are collected for medicinal purposes.
Meyna spinosa	Chetri ala	Leaves	Leaves are used as vegetable and dried leaves powder is used in curry.
Microcomdylaea bonellii	Junuk	Snail	Used as food.
Miliusa velutina	Ambe	Fruits	Fruits are edible.
Moringa oleifera	Munga ala	Leaves and flowers	Used as leafy vegetable.
Morus alba	Tus	Fruits	Fruits are edible.
Oecophylla smaragdina (Red weaver ant)	Kai/ Hau	Adult, eggs, larva	Used as a food (Chutney) by the locals.
Operculina turpethum	Nisoth	Stem	Stem is used as medicine.
Parambassis lala	Chanda	Fish	Used as food.
Pethia ticto	Pothi	Fish	Used as food.
Phyllanthus acidus	Harfarauri	Fruits	Fruits are edible.
P. emblica	Amla	Fruits	Fruits are edible and used for medicinal purposes.
P. reticulatus	Merle	Fruits	Fruits are edible.
Pithecellobium dulce	Jalebi fal	Fruits	Fruits are edible.
Polygonum barbatum	Sake ala	Leaves	Leaves are used as leafy vegetable.
P. plebeium	Mui Ala	Leaves	Used as leafy vegetable.
Portulaca oleracea	Lunia	Leaves	Leaves are used as leafy vegetable.
Pueraria tuberosa	Vidari kand	Tuber	Tubers having medicinal values.
Ricinus communis	Jada	Seeds	Seed oil is used in skin care.
Rivea hypocrateriformis	Kalmilata	Root	Roots are collected for medicinal uses.
Rotala rotundifolia	Cheuri ala	Leaves	Used as leafy vegetable.
Russula rosea	Patda chatu	Mushroom	Having food values.

Saccharum spontaneum	Kans ghas	Whole plant	Used in fishing.
Salmostoma bacaila	Banspatta	Fish	Used as food.
Schrebera swietenioides	Moka	Fruits	Fruit is used as a medicine.
Senna tora	Chakor	Leaves	Young leaves can be cooked as a vegetable.
Sesbania grandiflora	Agati	Flower	Flowers are used as vegetable.
Soymida febrifuga	Rakat rahda	Bark	Bark is collected for medicinal uses.
Spondias pinnata	Amda	Fruits	Fruits are edible.
Strychnos nux-vomica	Kuchila	Seed	Seed and seed oil used as medicine.
Syzygium cumini	Jamun/Jadre	Fruits	Fruits are used as nutraceutical.
Tamarindus indica	Imli	Fruits	Fruits have food and medicinal uses.
Terminalia arjuna	Arjun	Bark	Bark is used as a medicine.
T. bellirica	Bahada	Fruits	Fruits are used as medicine.
T. chebula	Harra	Fruits	Fruits are used as medicine.
Termitomyces heimii	Botam utt	Mushroom	Having food values.
Vitex negundo	Nagod/ Sinuar	Leaves	Leaves are used as biopesticide.
Xenentodon cancila	Gania mach	Fish	Used as food.
Ziziphus mauritiana	Ber/Kunirama	Fruits	Fruits are edible.
Z. oenopolia	Uli rama janum	Fruits	Fruits are edible.

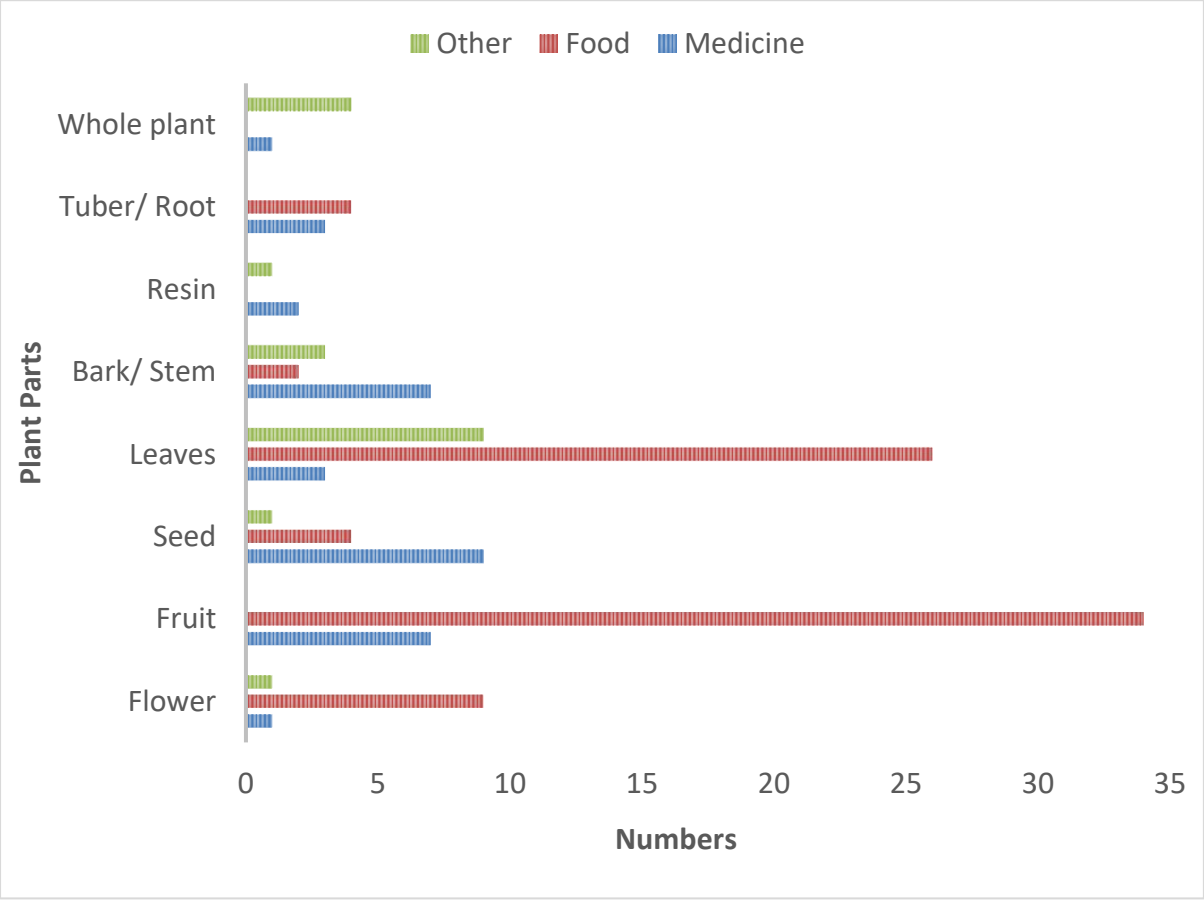

Figure 1: Diversity of MFPs of Jamtara Forest Division, Jharkhand

Plate 1: Common MFPs of JFD, A) Collection of leaves of *Semecarpus anacardium,* B & C) Collection of *Aristida setacea,* D) Collection of wild edible mushrooms, E) Making bamboo products

Figure 2: Several approaches to achieving value addition of MFPs

Medicinal plants: There are many commonly occurring medicinal plants that are marketed in the study area. Examples include, etc., *Schrebera swietenioides* (Moka), *Abroma augustum* (Ulat Kambal), and *Strychnos nux-vomica* (Kuchila).

Wild edible mushrooms: Wild edible mushroom collection holds significant economic importance and is predominantly practiced during the rainy season in the study areas, like *Astraeus hygrometricus, Russula rosea, Amanita egregia,* etc.

Grasses: Grasses have become one of the important MFPs used by the tribes with economic values. Like *Eulaliopsis binata* (Bobai ghas), traditionally used to make rope, *Aristida setacea* (Balki) and *Chrysopogon aciculatus* (Jhar gunda) are used to make brooms.

In addition to this, the communities also gather numerous edible fish and crabs from forest ponds, rivers, streams, and other water bodies. These minor faunal resources play a significant role in sustaining their livelihoods (Table 1).

Tribals in India have enjoyed the right to collect MFPs, that is, the products or services the people get from the forest other than timber, by tradition. Initially, they collected MFPs only for consumption, and now some MFPs are used by them for their livelihood, having economic importance. Earlier, many studies had been reported on MFPs and their utilization There are some products that the ethnic communities use as MFP but are not collecting directly from the forest. This includes leafy vegetables, edible fruits, tubers, etc., like *Chenopodium album* (Bhalu ala)—leaves and inflorescence are used as leafy vegetables. *Annona squamosa* (Sita fal) and *Annona reticulata* (Mandargum) fruits are edible. *Dioscorea alata* (Desi aalu) tubers are used as vegetables. Boiled tubers of *Ipomoea batatas* are edible. *Basella alba* (Poi) leaves are used as a leafy vegetable. *Murraya koenigii* (Katnim) leaves are used as a flavoring agent. *Hibiscus sabdariffa* (Kudroom) leaves are cooked as a leafy vegetable, and the calyces are used as food. These are some products used by the traditional forest dwellers as their traditional food. They cultivate these plants and use them for food, medicinal, and economic purposes. The Forest Department should promote the consumption of these traditional dishes by raising awareness while also providing support for enhancing the value of these MFPs. Some other researchers have also documented the NTFP of Jharkhand, India. Verma and Paul (2016) documented the non-timber forest products (NTFP) of Jharkhand. Mahato and Gaurav (2023) documented the economic analysis of NTFP of Jharkhand. Magry *et al.,* (2023) also discussed on economic aspects of NTFP of Jharkhand.

Value addition of Minor Forest Produces

Value addition in the context of minor forest produces (MFPs) refers to the process of enhancing the value of these products through various methods, such as processing, packaging, and marketing. This can result in increased economic benefits for local communities and businesses involved in the collection and trade of MFPs. Several approaches to achieve value addition are illustrated in Figure 2. By incorporating these strategies, value addition can contribute to the sustainable management of forests, biodiversity conservation, and improve the livelihoods of communities dependent on MFPs.

Conclusion

The income generated from minor forest produces (MFPs) is clearly influenced by various factors, such as ecological settings, seasons, and collection level. It has been established that a significant portion of rural, tribal, and forest-dependent communities heavily rely on MFPs for their food, nutrition, healthcare, and livelihood. The utilization and advancement of MFPs are being impeded by various factors, such as the absence of a clear policy framework, sustainable harvesting practices, the loss of

natural habitats, forest fires, the expansion of the human population, and the surging demand for these resources. To overcome these challenges and promote sustainable utilization of MFPs, it is crucial to establish an appropriate policy framework, encourage the cultivation of MFPs, and promote and establish facilities for storage, processing, value addition through the collaboration of existing schemes and programs in both the private & public sectors. Moreover, economists can formulate novel policies regarding the marketing of minor forest produces (MFPs) to enhance the profitability share for producers. Farmers are not actively cultivating MFPs but rather generating profit by collecting and selling them directly to consumers or through intermediaries at various levels. Additionally, the state government plays a crucial role in augmenting their profit by procuring most of the MFPs through commission agents or primary channels. Additionally, empowering communities with information about the market, policies, and products will enable them to strategize and access better returns from MFPs. The present explorer works on MFPs of JFD revealed that there is a good scope to do value addition in a sustainable manner, which could provide a sustainable livelihood for the communities of JFD as well as be helpful to conserve the bioresources of the division.

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