Ecology & Conservation Science: Open Access
ISSN: 2689-4637

Research Article
Volume 2 Issue 4 - May 2023
DOI: 10.19080/ECOA.2023.02.555595

Ecol Conserv Sci

Conservation of Prioritized Medicinal Plant Resources in a Tribal Dominated Areas of Central India

Vasu Choudhary[1], Sandhya Saini[1], Anita Thakur[1], Geeta Shahu[2], Kshiteeja Choudhary[3] and Tarun Kumar Thakur[1]*

[1]*Indira Gandhi National Tribal University, Amarkantak, Madhya Pradesh 484 887, India*

[2]*Mahatma Gandhi Antarrashtriya Hindi Vishwa Vidyalaya, Wardha, MS 442005, India*

[3]*Punjab Ayurved Medical College and Hospital, Sadulshahar, Rajasthan 302002, India*

Submission: May 18, 2023; **Published:** May 26, 2023

***Corresponding author**: Tarun Kumar Thakur, Indira Gandhi National Tribal University, Amarkantak, Madhya Pradesh 484 887, India, Email id: tarun.thakur@igntu.ac.in

Abstract

This study examines critical provisioning ecosystem services derived from medicinal & aromatic plants in a culturally and biodiversity rich landscape of the tribal dominated areas of Madhya Pradesh, Central India. Result reveals remarkable ethnic and location differences on utilization pattern of MAPs by tribal communities (i.e. Baiga, Gond, Kol, and Oraon). Training and experiential learning i.e. learning by doing improve the skills and knowledge for developing value added products and ensure higher returns to indigenous communities. The study will support and enhance the livelihood and economy of indigenous communities and finally put together the research conclusion to doubling their income of the aboriginal communities. Constantly while the obtainable information is limited and split, our approach provides a chance to suppose areas predicted to be appropriate for multiple species and to approximation the cultural value of a particular geographical area. Our results also indicate that to keep bio-cultural diversity, full information and active input of indigenous communities is essential. The flora of the study area is facing improper utilization and collection, overutilization, grazing, slash and burn, felling of trees, conversion of forest land to non-forest in the study area. Hence, suitable preservation strategies can be reformed to encourage the cultivation practices of medicinal plants. This study could be useful for designing suitable policy implications for improving flora and livelihoods of indigenous communities in changing bio-cultural environment of Central India.

Keywords: Endangered MAPs resources; RET species; Traditional knowledge; Medicinal uses; GIS mapping

Abbreviations: MP: Madhya Pradesh; SHG: Self Help Group; PRA: Participatory Rural Appraisal

Introduction

The traditional life style and culture of the people further prevent them adopting the modern agriculture production technologies. Lack of awareness, technical knowhow, and inadequate support systems are hampering to exploit the efficient use of water for improved agriculture [1,2]. Since the region is endowed with rich natural resources, the indigenous communities collect a wide variety of medicinal & aromatic plants from natural forests which substantially contribute for their economy and livelihood [3-7]. The animal products like honey, wax, lac etc. are also quite often extracted. The tribal masses even make indigenous crafts and tools from the naturally available resources apart from MAPs. But when it comes to marketing they are exploited by middle man and do not fetch the actual prices for the sale of above products [8,9]. The lack of knowledge of scientific methods of collection and processing makes them sale the products at the throw away prices. There is tremendous scope of improving indigenous practices and technologies by means of substituting low cost scientific interventions [10-12]. The major impediments in the process are the lack of knowledge of scientific methods of collection, conservation, cultivation and processing, affect the judicious exploitation of medicinal & aromatic plant resources. There is tremendous scope of improving indigenous practices and technologies by means of substituting low cost

scientific interventions. Domestication and propagation are important for management of eroding diversity.

The people were enjoying the state of their wilderness for their well-being but now they are at the verge of extinction due to globalization, population explosion, conversion of forest land for agriculture purpose and excess use of these resources by society without concerning conservation aspect. The concurrent state policy about organic farming and export zone for medicinal plants are now encouraging the local farmers for herbal cultivation but the scarcity of Germ-plasm is being felt of the top constraint hence, conservation and cultivation is immediate felt need from ecological as well as economical view point. As per sustainability indicators the ex-situ and in-situ medicinal plants conservation, raising nurseries and the package and practices of cultivation of these particular endemic species in scientific manner will assure the farmers of the region for opting this venture of growing medicinal plants for their better economy. The biodiversity or natural resources are the back bone of any nation without this, there is nothing on the globe [13]. The rich repositories of traditional knowledge among communities prompted to utilize many edibles diversely in folklore medicine, cultural ceremonies, worships and rituals. A wide array of WEPs and their parts including green leaves, shoots, grain legumes, flowers, fruits, nuts, seeds, gums, roots, tubers, edible mushrooms etc. are collected and consumed in the myriad forms as raw, pickled, baked, roasted, smoked, boiled, cooked and fermented products, which could act as a safety net against nutritional deficiencies [14-20].

A large number of ethnic groups mainly Baiga, Gond, Panika, Oraon, Pradhan, Kols and Pradhans are concentrated in the core, buffer and transition zones of AABR located in central India [4,21,22]. The indigenous and primitive cultivation practices coupled with limited land holdings, poverty, and poor marketing avenues forced these indigenous communities of AABR to heavily rely on wild edible resources, which remain continue as a traditional food habit in households. Among communities, Baiga and Gonds are extremely poor and every second family is food insecure as almost 45% to 70% ill afford to intake the recommended nutritional food [4,23,24]. The current knowledge on many important WEPs is woefully inadequate which became a challenge for devising strategies for conservation through sustainable utilization as many of them became rare and threatened in native ecosystems of Central India. There is now a consensus to bridge the knowledge gaps by quantifying the information on wild edibles, documenting tradtional knowledge on diverse uses, existing status and role in food security, household income, and prioritizing conservation are much needed for sustainable management of dwindling resources. Therefore, the present study has been conducted with the objective to document the diversity of WEPs, tradtional knowledge, consumption and their contribution in household income, food and nutritional security among different indigenous communities in AABR, Central India.

Materials and methods

Study area

Narmada River is a holy river of Central India originated from lofty mountain chain of Mekal hill ranges of Amarkantak, Madhya Pradesh. It is one of the five important sacred rivers of India. Unlike other major rivers, it flows in Westerly direction through the states of Madhya Pradesh, Maharashtra and Gujarat and finally culminates in Arabian Sea. Narmada River is a precious source of water for drinking, irrigation to agriculture, inland fisheries and industries. Multipurpose dams/projects are constructed across this river in different sites. Narmada River has become lifeline for millions of people are residing in Central and Western India. These rocks have weathered to give a wide variety of soils, which together with topography determine the vegetation and land-use.

Indigenous knowledge system

They have sound knowledge of numerous forest herbs and medicinal plants and well versed with traditional healing practices. Baigas have very limited resources for livelihood and most of them, if existing are often at the subsistence level. The Baiga households cook food in earthen pots, vessels and utilize leafy plates and gourds in past are now using utensils of steel, aluminum and brass. Pej is an important semi liquid drink prepared by boiling the coarsely crushed grains of corn, wheat and millets like kodo or kutki in water. Pej is considered as an extremely healthy food consumed in large quantities by the Baiga people, particularly during working periods as labour. Further, fruits, nuts, seeds and honey extracted from wild sources are consumed as raw or cooked. Mahua liquor, a fermented and distilled product of mahua flower is most popular alcoholic drink consumed regularly and widely consumed during festivals, rituals and ceremonies [4,12,15,22]. Food gathering, illegal hunting (fishes and small animals), collection of non-timber forest products, dairy and agriculture labour are the key sources of their income and livelihood. In buffer and transition zones, the other communities mainly Basore, Kewat, Kalar, Ahir, Kumhar, Nai, Goswami and forward communities like Rajput, Brhamin, Muslims etc. also resides harmoniously along with indigenous communities and enjoy tradtional foods on different occasions. The total population in buffer and transition zone together comprises approximately 0.6 million inhabited in rural and semi-urban settings, whose livelihoods mainly depend on agriculture and other allied activities [25].

Participatory Rural Appraisal (PRA)

Participatory Rural Appraisal (PRA) techniques, focused group interviews were used to document the indigenous knowledge and use of resources for domestic and commercial

How to cite this article: Vasu C, Sandhya S, Anita T, Geeta S, Kshiteeja C, et al. Conservation of Prioritized Medicinal Plant Resources in a Tribal Dominated Areas of Central India. Ecol Conserv Sci. 2023; 2(4): 555595. DOI: 10.19080/ECOA.2023.02.555595

purposes of medicinal plants. The situation and farming systems of medicinal plants were analyzed to design the training programs for cultivation techniques, conservation and marketing linkages, improved cropping practices and other interventions. The 50 tribal farmers were identified from each village and trainings were imparted on collection, processing and value addition techniques, cultivation, conservation of medicinal plants in the Amarkantak region and GPS and GIS mapping of the selected plants is depicted in (Figure 1) The tribal's were motivated to the formation of Self Help Group (SHGs) and start entrepreneurship for the development of small units for generating additional income and employment. The backward and forward linkages were worked out to strengthen the mechanism of marketing of products. It is targeted to directly benefit 300 indigenous people and indirect 10000 beneficiaries in the region.

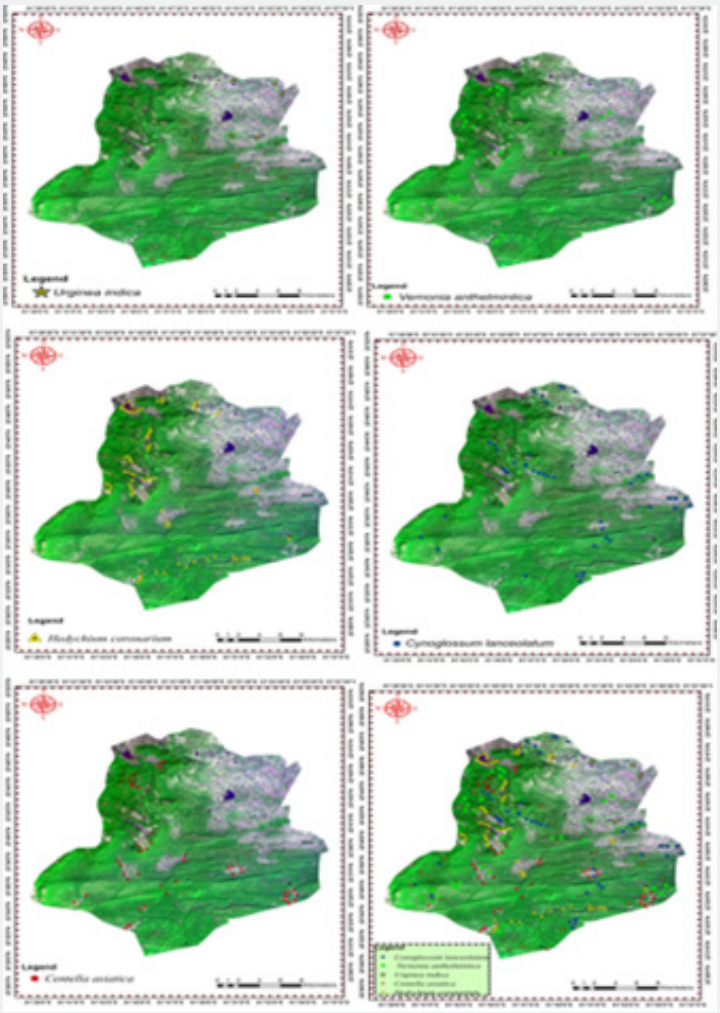

Figure 1: All Five Medicinal Plants identified by GPS technology (A, B, C, D & E) & GIS mapping of all Medicinal plants (F).

Results and discussion

General profile of sample villages and communities

Demographic features of study area revealed that total population in the sample villages ranged from 429 to 2244, of which people of indigenous communities were represented by 29% to 95% (Table 1). The number of households (>90 % huts and thatched mud houses) varied from 130 to 574, majority of the inhabitants received only primary and middle level education and thereafter engaged themselves in assisting elder members of the family in diversified activities. Sampling size of households ranged from 20 to 89 as per the proportional distribution, the Khodri and Gorakhpur are the big and small villages, respectively (Table 1). Each household owns a small piece of agriculture land (<2 ha) with limited number of domesticated cattle including cows, buffaloes, bullocks, sheep, goat, pigs and few families were also involved in backyard poultry and duck farming in small scale. The household food and income were mainly derived

How to cite this article: Vasu C, Sandhya S, Anita T, Geeta S, Kshiteeja C, et al. Conservation of Prioritized Medicinal Plant Resources in a Tribal Dominated Areas of Central India. Ecol Conserv Sci. 2023; 2(4): 555595. DOI: 10.19080/ECOA.2023.02.555595

from agriculture, MNREGA labour, livestock and sale of NTFP including WEPs, honey and animal products. Agriculture is the main activity in rainy and winter seasons, while agriculture labour, poultry, goat rearing, NTFP collection including WEPs are other activities usually carried throughout the year as per their abundance and availability. Agriculture crops like paddy, maize, finger millets, pulses and oil seeds are usually grown and vegetables are cultivated in homesteads in rainy season. However, the communities were unable to meet their household food requirements through agriculture therefore they have adopted multiple coping strategies through collection and consumption of wide variety of WEPs, honey, fish and animal products besides taking the advantage of public distribution system of food and nutrition programs operated by the government. Various plant parts of WEPs were collected and consumed either cooked or raw forms as tradtional food in addition to staple cultivated foods in the study area.

Table 1: Socio-Demographic characters of sample villages in the study site.

Sl. No.	Village	House holds	Total population	M	F	L (%)	IC (%)	AU	Sample households
1	Achanakmaar	130	535	283	252	64.18%	36.10%	15	20
2	Surhi	205	802	400	402	55.60%	79.10%	16	31
3	Lamni	147	634	354	280	57.56%	78.10%	18	22
4	Birjakachar	286	979	481	498	30.60%	70.50%	18	43
5	Khongsara	266	1052	526	527	57.44%	75.20%	12	40
6	Telipani	135	607	301	306	59%	95.30%	15	20
7	Gorakhpur	100	429	224	205	37.32%	86.10%	10	20
8	Khodri	574	2244	1127	1117	77.14%	29.10%	11	87
9	Shivtarai	325	1,297	641	656	76.19%	82.10%	10	49

Habitat and physiology of the medicinal herbs

Cyanoglossum lanceolatum have covered maximum area and it is a much branched, erect, biennial plants growing up to 150 cm tall, but more commonly to 100 cm. That plant is found in the forest, mountain and roadsides. The plant is harvested from the wild for local use as medicines. Hedychium coronarium (Gulbakawali) has been appears to be relatively shady tolerant, capable of growing in exposed site. They are both the flower and rhizomes are also addicted as vegetables [26,27]. Ben Urginea, a native early Arab family of Annaba. It is a recurrent round geophytes of family Hyacinthaceae now located in Asparagaceae. The hysteranthous geophytes are characterize by possessing enduring storage organs, a separate flowering stem, start of peak taking place leaf growth in winter, seed dispersion at once after flowering. We have to devise area and community specific marketing strategies of medicinal plants, keeping in mind the judicious uses of resources and their proper conservation [22]. Indian state of Madhya Pradesh (MP) has highest number of tribal population, percentage wise roughly > 25% of its total population is made up different tribal groups. A greater part of the state is bestowed with lush green forest vegetation harboring a plenty of medicinally important plants, many of which are endemic to a particular area. Kala [28] advocated the policy of exploring small areas for floristic studies, which are essential for taxonomy, conservation, management & sustainable utilization of plant wealth of a region.

Medicinal uses of selected plants

Apart from edible uses, a sum total of 70 MAPs were recognized and diversely utilized for their medicinal value and employed in primary health care of indigenous communities. All plant parts including leaves, twigs, bark, flowers, fruits, pods, roots, tubers, gums, resins and rhizomes were used in preparation of herbal drugs. The tradtional practitioners/healers locally known as Vaidyas were well versed and possess sound knowledge in preparation of crude drugs and treatment of various ailments. The formulation in the form dried powders, extracts, pastes, decoctions with hot and cold water, tablets were administered externally or internally to cure various diseases (Table 2). The ICF values were found to be maximum (0.94) for fever and headache and minimum (0.6) for asthma and respiratory diseases. Ten (10) taxa were employed in curing fevers and headaches and had highest number (512) of use reports followed by stomach disorders (453) and cough and cold (421). The lower number of use reports were recorded for skin (325) and respiratory (310) ailments. The study highlighted the traditional knowledge of Baigas who are rich in ethnos medicinal knowledge compared to other communities because the knowledge is transmitted from their ancestors. While comparing the current data with previous ethnos botanical investigation dealing with medicinal usage reflected that 40% of WEPs had also exploited for medicinal purposes. The underlying fact of overlapping of the food and healthcare functions of wild edible plants were widely recognized [29-31]. The number species having medicinal value in our

How to cite this article: Vasu C, Sandhya S, Anita T, Geeta S, Kshiteeja C, et al. Conservation of Prioritized Medicinal Plant Resources in a Tribal Dominated Areas of Central India. Ecol Conserv Sci. 2023; 2(4): 555595. DOI: 10.19080/ECOA.2023.02.555595

study was lesser compared to 135 species (115 genera) from 63 families reported by Mishra [32] in Amarkantak, Madhya Pradesh possibly due to accounting only WEPs having medicinal value in this study, while latter also included other species used as herbal medicines. Baiga and Gond healers were especially acquainted in preparation of crude drugs from medicinal plants through indigenous knowledge and ancestral prescription. Nevertheless the ethnos medicinal practice is gradually declining in AABR due to introduction of modern allopathic health care systems, decrease in number of traditional practitioners and limited transfer of traditional knowledge. The younger generation has apathy towards traditional forms of medicine rather inclined to alternate source of medicines for quick healing and immediate relief, which are usually prescribed by medical practitioners of community health centers.

Table 2: List of medicinal plants used by indigenous communities of Central India.

S. No.	Botanical name	Family	Local name	Part used
1	*Abelmoschus moschatus Medik.*	*Malvaceae*	Katuri Bhendi	Leaves and seeds
2	*Allium tuberosum Roxb.*	*Liliaceae*	Van lasun	Leaves and bulb
3	*Achyranthes aspera Linn.*	*Amaranthaceae*	Chirchitta, Latjeera	Root and leaf extracts
4	*Alternanthera sessilis Mart.*	*Amaranthaceae*	Gudari shak	Twigs
5	*Alternanthera philoxeroides Mart.*	*Amaranthaceae*	Katuashak	Twigs and leaves
6	*Amaranthus hybridus Linn.*	*Amaranthaceae*	Lalbhaji	Leaves
7	*Amaranthus spinosus Linn.*	*Amaranthaceae*	Kanta Cholai, Barre	Leaves
8	*Antidesma diandrum Roxb.*	*Euphorbiaceae*	Saroti	Leaves &fruits
9	*Argyreia strigosa (Roth) Sant.*	*Convolvulaceae*	Baghchooda	Young leaves
10	*Asparagus racemosus Willd.*	*Liliaceae*	Satavar	Roots
11	*Basella rubra Linn.*	*Basellaceae*	Poi	Leaves
12	*Boerhavia diffusa Linn.*	*Nyctigenaceae*	Ghetuli	Leaves
13	*Bridelia retusa (Linn.) Spreng.*	*Kasai, Jamalvati*	Phyllanthaceae	Bark
14	*Careya arborea Roxb.*	*Myrtaceae*	Kumbhibaji	Bark & flower
15	*Cassia fistula Linn.*	*Fabaceae*	Amltas, dhanbaher	Root
16	*Cassia tora Linn.*	*Fabaceae*	Charota	Leaves & seeds
17	*Cayratia auriculata (Wall.) Gamble*	*Vitaceae*	Jangali angoor	Leaves
18	*Celastrus paniculatus Willd.*	*Celastraceae*	Malkangan	Seeds
19	*Chlorophytum arundinaceum Baker*	*Liliaceae*	Safed musli	Roots
20	*Chlorophytum tuberosum (Roxb.) Bak.*	*Asparagaceae*	Safed Musli	tuber
21	*Chenopodium album Linn.*	*Amaranthaceae*	Batuabhaji	Whole plant
22	*Colocasia esculenta (Linn.) Schott.*	*Araceae*	Ghuia, Ruia	tubers
23	*Colocasia esculenta Linn.*	*Araceae*	Jungle Arbi/ghuia	Leaves
24	*Commelina benghalensis Linn.*	*Commelinaceae*	Kenna	Stem
25	*Costus speciosus (J.Koenig) Sm.*	*Zingiberaceae*	Kewkanda	Rhizomes
26	*Curculigo orchioides Gaertn.*	*Liliaceae*	Kali musali	Roots
27	*Curcuma angustifolia Roxb.*	*Zingiberaceae*	Thikur	Rhizome
28	*Cordia myxa Forst.*	*Boraginaceae*	Bohar	Leaf & Fruit
29	*Capparis zeylanicum L.*	*Capparaceae*	Ardanda,Jhiris	Leaves
30	*Cordia dichotoma G.Forst.*	*Boraginaceae*	Lasooda	Fruits
31	*Digera muricata (L.) Mart*	*Amaranthaceae*	Chanchali	Seeds and flowers
32	*Emilia sonchifolia (L.) DC. ex Wight*	*Asteraceae*	Hirankuri	Leaves
33	*Dioscorea bulbifera (L.)*	*Dioscoreaceae*	Damgkanda	tuber
34	*Dioscorea hispida Dennst.*	*Dioscoreaceae*	Kuliakand	tuber
35	*Emilia sonchifolia (L.) DC. ex Wight*	*Asteraceae*	Hirankuri	Leaves & young shoots

How to cite this article: Vasu C, Sandhya S, Anita T, Geeta S, Kshiteeja C, et al. Conservation of Prioritized Medicinal Plant Resources in a Tribal Dominated Areas of Central India. Ecol Conserv Sci. 2023; 2(4): 555595. DOI: 10.19080/ECOA.2023.02.555595

36	*Ficus infectoria Roxb.*	*Moraceae*	Pakri	Leaves
37	*Eryngium foetidum Linn.*	*Apiaceae*	Van dhania	
38	*Ficus infectoria Roxb.*	*Moraceae*	Pakri	Roots
39	*Azadirachta indica A.Juss.*	*Meliaceae*	Neem	Shoots, Flowers, Leaves
40	*Sesbania grandiflora (L.) Poiret*	*Fabaceae*	Agathi	Leaves, Flowers
41	*Indigofera pulchela L.*	*Fabaceae*	Neeli	Whole plant, Leaves and Root
42	*Cochlospermum religosum (L.) Alston*	*Bixaceae*	Galgal	Seeds
43	*Aegle marmelos L.*	*Rutaceae*	Bel	Fruit
44	*Semecarpus anacardium L.f.*	*Anacardiaceae*	Bheluva	Seeds
45	*Solanum nigrum, Linn*	*Solanaceae*	Makai	Fruits
46	*Terminalia chebula (Gaertn.) Retz.*	*Combretaceae*	Harre, Harra	Fruit cover
47	*Terminalia bellerica (Gaertn.) Roxb.*	*Combretaceae*	Bahera	Fruit
48	*Oxalis corniculata Linn.*	*Oxalidaceae*	Tinpatiya	Leaves
49	*Woodfordia floribunda (Roxb.) Bedd.*	*Lythraceae*	Dhavai	Flowers
50	*Mucuna pruriens (L.) DC*	*Fabaceae*	Kewanch	Pods
51	*Urginea indica (Roxb.) Kunth Banpalandu,*	*Liliaceae*	Van piyaj	bulb
52	*Moringa oleifera*	*Moringaceae*	Munga	Leaves, Fruit
53	*Cassia fistula L.*	*Fabaceae*	Amaltas	Leaves, Flowers
54	*Curcuma caesia Roxb*	*Zingiberaceae*	Kalihaldi	Rhizome
55	*Leea macrophyla Roxb. ex Hornem.*	*Vitaceae*	Hathphan,	Root, leaves, fruits
56	*Sterculia urens Roxb.*	*Sterculiaceae*	Kullu,	Gum, Bark
57	*Zingiber cassumunar Roxb.*	*Zingiberaceae*	Jangali Adrak	Rhizome
58	*Achyranthes aspera Linn.*	*Amaranthaceae*	Chirchitta, Latjeera	Tender Leaves, root, seeds
59	*Alternanthera sessilis Mart.*	*Amaranthaceae*	Gudari shak	Leaves, flowers
60	*Antidesma diandrum Roxb.*	*Euphorbiaceae*	Saroti	Leaves
61	*Argyreia strigosa (Roth) Sant.*	*Convolvulaceae*	Baghchooda	Roots
62	*Lepidium sativum Linn.*	*Brassicaceae*	Chandrasur	Young leaves
63	*Limnophila rugosa (Roth.) Merr.*	*Scrophulariaceae*	Bintugo	Leaves
64	*Marsilea minuta Linn.*	*Marsileaceae*	Sunsiniya	Leaves
65	*Murraya koenigii (Linn.) Sprengal*	*Rutaceae*	Mitineem	Leaves
66	*Polygonum barbatum Linn.*	*Polygonaceae*	Bekhanjabaj	Leaves
67	*Portulaca quadrifida Linn.*	*Portulaceae*	Bhuibazi	Leaves, young shoots
68	*Shorea robusta Gaertn.*	*Dipterocarpaceae*	Hargami	Flowers, Gum
69	*Smithia conferta Sm.*	*Fabaceae*	Duthi	Leaves
70	*Woodfordia floribunda (L.) Kurz*	*Lythraceae*	Dhaura, Van mahendi	Leaves, flowers

The present study showed that contribution of wild foods to total food consumed was low due to lower frequency and use of small portion sizes (Figure 2). Seeds of Bauhinia vahilli are rich source of crude protein (24.8%) and lipid (28.5%), while leaves and pods of M. oleifera rich source of carotene and vitamin A, all these species could be promoted to consume in adequate quantities to meet the nutritional requirements as per the recommended dietary allowances. Still lot of work is needed to explore a wide array of WEPs possessing good nutritional qualities and encourage them to introduce in adequate quantities in traditional diets to add diversity in foods and combating malnutrition prevailing among the communities. The potential contribution of wild edibles to nutritional composition in diets could be improved as per desired levels through promoting WEPs in core and buffer

How to cite this article: Vasu C, Sandhya S, Anita T, Geeta S, Kshiteeja C, et al. Conservation of Prioritized Medicinal Plant Resources in a Tribal Dominated Areas of Central India. Ecol Conserv Sci. 2023; 2(4): 555595. DOI: 10.19080/ECOA.2023.02.555595

zones. The undernourishment of indigenous communities was not ascribed to a single factor but cascading effect of a several of factors like poor socio-economic, divergent cultural, religious habits and biogeographic conditions which affect the food and nutritional securities of indigenous communities which is also in the reports those available in surrounding environments of AABR, Central India [33-35]. Traditional methods of collection of WEPs were gradually replaced and over harvesting with unscientific procedures came in place resulting in degeneration of many important species. The collection of wild edibles was done by heavy lopping of branches and premature collections of rhizomes of Costus speciosus (Koen.) Sm. and excessive harvest of young shoots of bamboos could result in failure of their natural regeneration. The unscientific and over harvesting are potential threats to WEPs, therefore the most vulnerable species such as Buchnania lanzan, Emblica officinalis, Asparagus, Bamboos and Terminalias could be protected. Strategies and policies need to be reframed to strengthen the conservation and long-term management of WEP species in this region. The sustainable utilization of the resources and indigenously knowledge of edible plants could improve the livelihoods of indigenous people of AABR [10]. Community based conservation and management need to explored, as local people are actual custodians and consumers of valuable resources and have rich knowledge on diverse uses. Besides in-situ conservation, the ex-situ methods need to be practiced to protect the loss of valuable WEPs especially in buffer and transition zones of AABR [35-36]. Domestication of WEPs wherever it is possible to ensure continued availability and the nutritional gardens need to be established in homesteads to supply the food materials for balanced diets. The continuous technical and material support will be ensured through programs and policy interventions; however financial implications must be carefully considered for promotion of WEPs in securing food and nutritional demands of indigenous communities of AABR, central India.

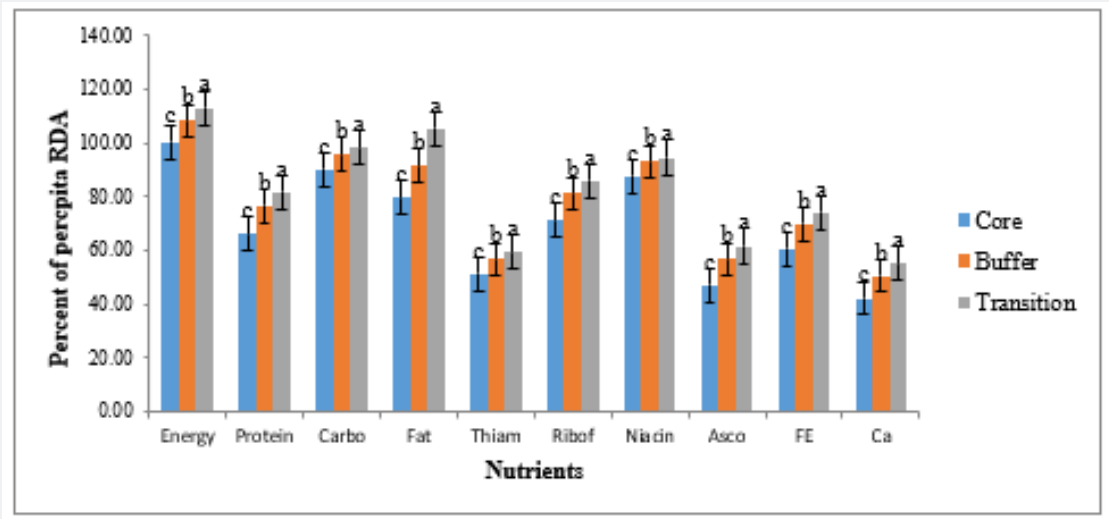

Figure 2: Per capita intake of nutrients as percent of RDA by indigenous communities in Central India.

Conclusion

The study has targeted to directly benefit the downtrodden indigenous communities (i.e. Baiga, Gond, Panika, Kols, Agaria) from the tribal dominated villages in Central India by imparting skill oriented training on collection, preservation, processing and value addition of Medicinal and Aromatic plants and also forest based enterprises for enhancing agriculture production. This is a critical angle considering the socio-economic scenario of the local inhabitants and increasing production area of medicinal plants with every passing year which plays a crucial role in socio-economic developments of the region. Sustainable development balancing the crucial interplay of natural and anthropogenic factors is the need of the hour. The outcome of the study was used as a model to conserve MAPs, sustainable development and utilization of biodiversity conservation and replicating adjoining areas.

References

1. Thakur TK, Padwar GK, Patel DK (2019) Monitoring land use, species composition and diversity of dry tropical environ in Achanakmaar Amarkantak Biosphere Reserve, India using satellite data. Biodiversity Int J 3(4): 162-172.

2. Thakur TK, Patel DK, Bijalwan A, Dobriyal MJ, Kumar A (2020) Land use land cover change detection through geospatial analysis in an Indian Biosphere Reserve. Trees, Forests and People 2: 100018.

How to cite this article: Vasu C, Sandhya S, Anita T, Geeta S, Kshiteeja C, et al. Conservation of Prioritized Medicinal Plant Resources in a Tribal Dominated Areas of Central India. Ecol Conserv Sci. 2023; 2(4): 555595. DOI: 10.19080/ECOA.2023.02.555595

3. Rajalakshmi S, Vijayakumar S, Arulmozhi P (2015) Ethnobotanical survey of medicinal plants in Thanjavur and its surrounding (Tamil Nadu-India). Acta Ecol Sin 39(5): 380-397.
4. Mishra A, Swamy SL, Thakur TK, Bhat R, Bijalwan A (2021) Use of Wild Edible Plants: Can They Meet the Dietary and Nutritional Needs of Indigenous Communities in Central India, Foods 10(7): 1453.
5. Thakur T, Kumar Y, Bijalwan A, Dobriyal MJR (2017) Traditional Uses and Sustainable Collection of Ethnobotanicals by Aboriginal Communities of the Achanakmaar Amarkantak Biosphere Reserve of India. Frontiers in Environmental Microbiology 3(3): 39-49.
6. Thakur TK, Dutta J, Upadhyay P, Patel DK, Thakur A (2021) Assessment of land degradation and restoration in coal mines of central India: A time series analysis. Ecological Engineering 175: 106493.
7. Thakur TK (2018) Diversity composition and structure of understory vegetation in the tropical forest of Achanakmaar Biosphere Reserve, India. Environment Sustainability 1(2): 279-293.
8. Thakur T, Swamy SL, Nain AS (2014) Composition structure & diversity analysis of dry tropical forest of Chhattisgarh using Satellite data. Journal of Forestry Research 25(4): 819-825.
9. Bijalwan A, Bahuguna K, Vasishta A, Singh A, Chaudhary S, et al. (2021) Growth Performance of Ganoderma lucidum using billet method in Garhwal Himalaya, India. Saudi J Biol Sci 28(5): 2709-2717.
10. Darro H, Swamy SL, Thakur TK, Mishra A (2020) Floristic Composition, Structure, Diversity and Conservation Strategies for Rehabilitation of Dry Tropical Forests in Buffer Zone of Achanakmaar Amarkantak Biosphere Reserve (AABR), India. Int J Curr Microbiol App Sci 9(4): 650-663.
11. Kumar S, Bijalwan A (2021) Comparison of Carbon Sequestration Potential of Quercus leucotrichophora Based Agroforestry Systems and Natural Forest in Central Himalaya, India. Water Air and Soil Pollution 232(9): 350.
12. Kumar Y, Thakur T, Sahu ML, Thakur A (2017) A Multifunctional Wonder Tree: Moringa oleiferaLam Open New Dimensions in Field of Agroforestry in India. Int J Curr Microbiol App Sci 6(8): 229-235.
13. Bijalwan A, Dobriyal M, Thakur TK (2020) Silviculture and Agro forestry: why merger in the era of super specialization? Biodiversity Int J 4(3): 138-139.
14. Kumar Y, Kumar B, Chandraker SK, Padwar GK, Dubey AK, et al. (2017) Mahua (Madhucaindica) (Koenig) J.F. Macribide) A Nature, Reward to Tribal Ecosystem of Central India. Int J Curr Microbiol App Sci 6(4): 1519-1526.
15. Adil M, Singh N, Dubey SK, Thakur TK, Alkan N, et al. (2020) Phytochemical Characterization and Assessment of Crude Extracts from Lantana camara L. for antioxidant and Antimicrobial Activity. Frontiers in Agronomy.
16. Singh N, Mansoori A, Jiwani G, Kumar A (2021) Antioxidant and antimicrobial study of Schefflera vinosa leaves crude extracts against rice pathogens. Arabian Journal of Chemistry 14(7): 103243.
17. Bijalwan AK, Bahuguna A, Vasishta A, Singh S, Chaudhary A, et al. (2021) Growth Performance of Ganoderma lucidum using billet method in Garhwal Himalaya, India. Saudi Journal of Biological Sciences.
18. Bharucha Z, Pretty J (2010) The roles and values of wild foods in agricultural systems. Philos Trans R Soc B Biol Sci 365(1554): 2913-2926.
19. Kumar Y, Thakur T (2017) Agroforestry: Viable and Futuristic Option for Food Security and Sustainability in India. Int J Curr Microbiol App Sci 6(7): 210-222.
20. Basu A, Mukherjee N, Roy S, Sengupta S, Banerjee S, et al. (2003) Ethnic India: a genomic view, with special reference to peopling and structure. Genome Res 13(10): 2277-2290.
21. Das S, Bose K (2015) Adult tribal malnutrition in India: an anthropometric and socio-demographic review. Anthropological review 78(1): 47-65.
22. Census (2011) Primary Census Abstracts, Registrar General of India, Ministry of Home Affairs, Government of India.
23. Sarangthem N, Talukdar NC, Thongam B (2012) Collection and evaluation of Hedychium species of Manipur, Northeast India. Genet Resour Crop Evol.
24. Mohanty N, Panda T, Sahoo S, Rath SP (2015) Herbal folk remedies of Dhenkanal district, Odisha, India. Int J Herb Med 3: 24-33.
25. Kala CP (2009) Aboriginal uses and management of ethnobotanical species in deciduous forests of Chhattisgarh state in India. Journal of Ethnobiology and Ethnomedicine 5(1): 1-9.
26. Chauhan SH, Yadav S, Takahashi T, Łuczaj Ł, DCruz L (2018) Consumption patterns of wild edibles by the Vasavas: a case study from Gujarat, India. Journal of Ethnobiology and Ethnomedicine 14(1): 1-20.
27. Aryal KP, Poudel S, Chaudhary RP, Chettri N, Chaudhary P (2018) Diversity and use of wild and non-cultivated edible plants in the Western Himalaya. Journal of Ethnobiology and Ethnomedicine 14(1): 1-18.
28. Uprety Y, Poudel RC, Shrestha KK, Rajbhandary S, Tiwari NN, et al. (2012) Diversity of use and local knowledge of wild edible plant resources in Nepal. Journal of Ethnobiology and Ethnomedicine 8(1): 1-15.
29. Thakur TK, Patel DK, Thakur A, Kumar A, Bijalwan A, Bhat JA, Kumar A, Dobriyal MJ, Kumar M and Kumar A. 2021. Biomass Production Assessment in a Protected Area of Dry Tropical Forest Ecosystem of India: A Field to Satellite Observation Approach Front Environ Sci 9: 757976.
30. Mishra M (2013) Utilization of wild tuberous plants in extreme environmental conditions: a case of Baiga tribe of central India. The Journal of Ethnobiology and Traditional Medicine pp: 366-372.
31. Jain AK, Tiwari P (2012) Nutritional value of some traditional edible plants used by tribal communities during emergency with reference to Central India 11: 51-57.
32. Shirisha P (2019) Socioeconomic determinants of nutritional status among 'Baiga' tribal children in Balaghat district of Madhya Pradesh: A qualitative study. PloS one 14(11): e0225119.
33. Sahoo G, Swamy SL, Mishra A, Thakur TK (2020) Effect of seed source, light and nitrogen levels on biomass and nutrient allocation pattern in seedlings of Pongamia pinnata. Environmental Science and Pollution Research.
34. Bijalwan A, Verma P, Dobriyal MJR, Patil AK, Thakur TK (2019) Trends and Insight of Agroforestry Practices in Madhya Pradesh, India. Current science 117(4): 579-605.
35. Thakur TK, Patel DK, Dutta J, Kumar A, Kaushik S (2021) Assessment of Decadal Land Use Dynamics of Upper Catchment Area of Narmada River, the lifeline of Central India. Journal of King Saud University-Science 33: 101322.
36. Thakur TK, Swamy SL, Bijalwan A (2019) Assessment of biomass and net primary productivity of a dry tropical forest using geospatial technology. Journal of Forestry Research 30(1): 157-170.

How to cite this article: Vasu C, Sandhya S, Anita T, Geeta S, Kshiteeja C, et al. Conservation of Prioritized Medicinal Plant Resources in a Tribal Dominated Areas of Central India. Ecol Conserv Sci. 2023; 2(4): 555595. DOI: 10.19080/ECOA.2023.02.555595

DOI: 10.19080/ECOA.2023.02.555595

How to cite this article: Vasu C, Sandhya S, Anita T, Geeta S, Kshiteeja C, et al. Conservation of Prioritized Medicinal Plant Resources in a Tribal Dominated Areas of Central India. Ecol Conserv Sci. 2023; 2(4): 555595. DOI: 10.19080/ECOA.2023.02.555595