ISSN: 2457-0761

JBC-APRF-4(2): 344-344, 2020

JOURNAL OF BIODIVERSITY AND CONSERVATION

Conservation of wild edible plants diversity in the kitchen gardens for nutraceutical by tribal women of Mizoram, India

Saujanendra Swain[1*], Suhita Chakrabarty[2], Zomuankima[3] and Vanlalhmangaia[4]

[1]National Resource Person, National Rural Livelihoods Mission, Government of India
[2]Mission Manager- MKSP, National Rural Livelihoods Mission, Government of India
[3]State Mission Manager- Livelihoods, Mizoram State Rural Livelihoods Mission. Government of Mizoram
[4]Project Manager- Livelihoods, Mizoram State Rural Livelihoods Mission. Government of Mizoram

Corresponding author's E-mail-Id: saujanendra@gmail.com

ARTICLE INFO

Article History

Received: 31 May 2020

Received in revised form: 12 June 2020

Accepted: 14 June 2020

Keywords: Conservation, Wild nutraceuticals, Kitchen garden, Biodiversity, Ethnobotany

ABSTRACT

In India, women play a significant role in managing the biodiversity of their regions to sustain their family livelihoods. The paper made an attempt to study and document the domestication of certain wild plant diversity, which were used for foods and medicines by the tribal women farmers in Mizoram state, and the contribution of women farmers in managing the biodiversity. The study was conducted in Serchhip and Kolasib districts of Mizoram state in January 2020. Results revealed that the tribal women farmers of Mizoram has domesticated seven different plant species in their home gardens or kitchen gardens, which includes four tree species, two shrubs and one fern. Enumerated species are used for both foods and medicines. The study documented the botanical name, family, local name, parts used and the purpose of use(s). The present study highlights the importance of women farmer in the conservation of genetic diversity.

INTRODUCTION

The food security of different communities is based on biodiversity in field and forests. Women in many societies play a significant role in managing the diversity of eco system, since they are responsible for sustaining the livelihood of the family. They used to develop multiple strategies for their farming system and most of these are based on a sophisticated management

of genetic diversity (Sareke 2017). Biodiversity is the foundation of the life on Earth but the population explosion, habitat destruction, over harvesting, pollution, and limited resources has led to a serious loss of biodiversity. Women perform many agricultural activities throughout the world. They also grow a wide variety of vegetables, relish and condiments in their kitchen gardens and collect medicinal plants to cure various ailments. The knowledge of women about forest and forest products is tremendous and preservation of this knowledge is crucial for biodiversity. Their knowledge in biodiversity contains unique insights into local species and ecosystem gained from centuries of practical experiences. In most of the rural societies, it is a common fact that women are invisible managers of local resources that include land, water, forest and wild life. Most of them are poor and uneducated but they are the great sustainers of rural micro economic activities. Their traditional knowledge brings them in direct contact with the natural resources (Sareke 2017). The traditional knowledge systems have gained a prime importance in context with conservation, utilization and sustainable development of plant resources. The ethno-medicinal plants play a major role amongst the tribal and rural people in their traditional healthcare systems (Hazarika et al. 2012). This indigenous system of treatment based on wild edible plant is still an important part in Mizo social life and culture but this traditional knowledge of the local people has been transferred orally from generation to generation without proper documentation. Therefore, the claimed therapeutic values of the reported species are to be critically studied to establish their safety and effectiveness and to preserve these high valued wild edible plants species (Hazarika et al. 2012).There were many works has been carried out on wild edible plants of Mizoram by Rahmatullah et al. (2011), Hazarika et al. (2012), Kar et al. (2013), Angami et al. (2018), Ramachandra et al. (2018), Laha et al. (2018) and Khomdram et al. (2019). Similarly, the work on ethno-medicinal uses of wild plants among the Mizo tribes also studied by various researchers (Sharma et al. 2001; Rai et al. 2010; Lalfakzuala et al. 2012; Lalramnghinglova et al. 2016). It is observed from securitizing these papers, that very sporadic works have been carried out on wild edible plants species of Mizoram and there was no study on conservation strategies adopted by the people particularly women to conserve the biodiversity. Therefore, the present study focuses on the domestication aspects of wild plant species of Mizoram, which are used as food as well as medicines by the tribal women farmers. The study was conducted as a part of the evaluation of the Mahila Kishan Shasaktikaran Pariyojana (MKSP) project supported under National Rural Livelihoods Mission (NRLM) and implemented by Mizoram State Rural Livelihoods Mission. National Rural Livelihoods Mission (NRLM) was lunched by the Ministry of Rural Development (MoRD), Government of India in 2011 with partly investment support by the World Bank. The NRLM mission is to reduce poverty by enabling the poor households to access gainful self-employment and skilled wage employment opportunities, resulting in appreciable improvement in their livelihoods on a sustainable basis, through building strong grassroots institutions of the poor. The NRLM implements its programme through

the State Rural Livelihoods Mission (SRLM). The Mahila Kishan Shasaktikaran Pariyojana (MKSP) is a sub-component of National Rural Livelihoods Mission. The major objective of the MKSP is to empower women in agriculture by making systematic investments to enhance their participation and productivity, as also create and sustain agriculture-based livelihoods of rural women. One of the focused activities of MKSP is to establish Home Gardens or Kitchen gardens in the backyard of women farmers without application of any chemical fertilizer and pesticides. Mizoram State Rural Livelihoods Mission is established in the year 2013 to implement the NRLM activities in the state of Mizoram. At present, the SRLM works in six districts of Mizoram covering 17 rural development blocks. Mizoram is a landlocked country located in the extreme north-eastern part of India. It is located between 21˚58' & 24˚35' N latitude and 92˚15' & 93˚29'E longitude. The total geographical area of the state is 21,081 sq.kms. it is bordered by Myanmar in east, Bangladesh and Tripura state in the west, Assam state in north and Myanmar in south. The state is divided into 8 districts and 26 rural development blocks. The total population of the state is 10, 91,014; of which 94.7% are tribal. The sex ratio of the state is 975 females per 1000 male. The literacy rate of the state is 91.85 %, the second highest in India. The annual average rainfall of the state is 2500 mm. The temperature of the state varies from 11^0C to 30 ^{0}C. The state has 90.68 % of forest cover and harbours 2200 flowering plant species. Soil type of the state varies from sandy loam, clayey loam to clay. The study was conducted in 12 villages located under three community development blocks of Serchhip and Kolasib districts of Mizoram state, India.

METHODOLOGY

The study was conducted from 10th to 20th January 2020 as a part of evaluation of the Mahila Kishan Shasaktikaran Pariyojana (MKSP) project implemented by Mizoram SRLM, which was operated in four blocks of Serchhip and Kolasib districts (Figure 1). The study was based on extensive field works, plant collection and the interviews with the local tribal women farmers.Structured personal interviews were conducted with 43 tribal farmers women, the community resource persons, the village council members and other elderly people of the village through a format. One focus group discussion was also conducted per village to validate the information collected through personal interviews. Samples of different plant species were collected to prepare herbariums adhering to the norms of standard herbarium techniques for proper botanical identification. The local name of the plant species was recorded along with the habits of the plants and its distribution. Visits were made to few home gardens/ Kitchen gardens developed by the tribal women farmers to see, where these wild edible plants were planted. Photographs of each of these plant species were took from the field sites. The herbariums are kept at Mizoram State Rural Livelihoods Mission office for future references.

RESULTS & DISCUSSION

Seven plant species belonging to 5 families (Araliaceae, Athyiaceae, Fabaceae, Meliaceae and Verbenaceae) were recorded which were used both as food and medicines by tribal women farmers of Mizoram. The Family

Fabaceae and Verbenaceae are represented by two species, whereas the rest three families are having single species only. Out of the total 7 plant species, three are trees, three are shrubs and one is fern (Table 1; Plate 1). Details of all the plant species recorded, their common name, english name, botanical name, family and habits are provided in Table-1. The tender leaves of four plants (*C. colebrookianum*, *C. infortunatum*, *D. gobara* & *D. esculentum*) are used as vegetable, where as one plant, the pods are used as vegetables (*P. roxburghii*) and the flowers of two plants (*D. gobara* & *T. palmata*) are used as vegetables (Table 2). Survey revealed that all enumerated plants (Plate 1) are used to treat common diseases like blood pressure, colic, diabetes, diarrhoea, dysentery, easy delivery, fever, hypertension, itches and scabies, indigestion, skin diseases, stomach-ache and worm infection. Out of all the diseases listed above, the common diseases treated through these plants are diabetes, diarrhoea and skin diseases. In 90% of the cases, the leaves are used to treat the diseases, where as in some cases either the pod or the root is used for medicine (Table 3). Most of plant plant species those are belongs to Fabaceae family, naturally fixes atmospheric nitrogen into the soil, there by enriching the soil with nitrogen (Roy et al 2016). These species help the home garden/ Kitchen garden in enriching the soil with atmospheric nitrogen, which means there is no need for application of external of nitrogen in the kitchen gardens or home gardens. Species belonging to the families Meliaceae and Verbenaceaehas the potency of insecticidal effect for the pests or insects (Noraini 1996). Planting of these species in home gardens or kitchen gardens helps in eradication of pests/ insects and act as an insect repellent (Mohammed et al 2011).

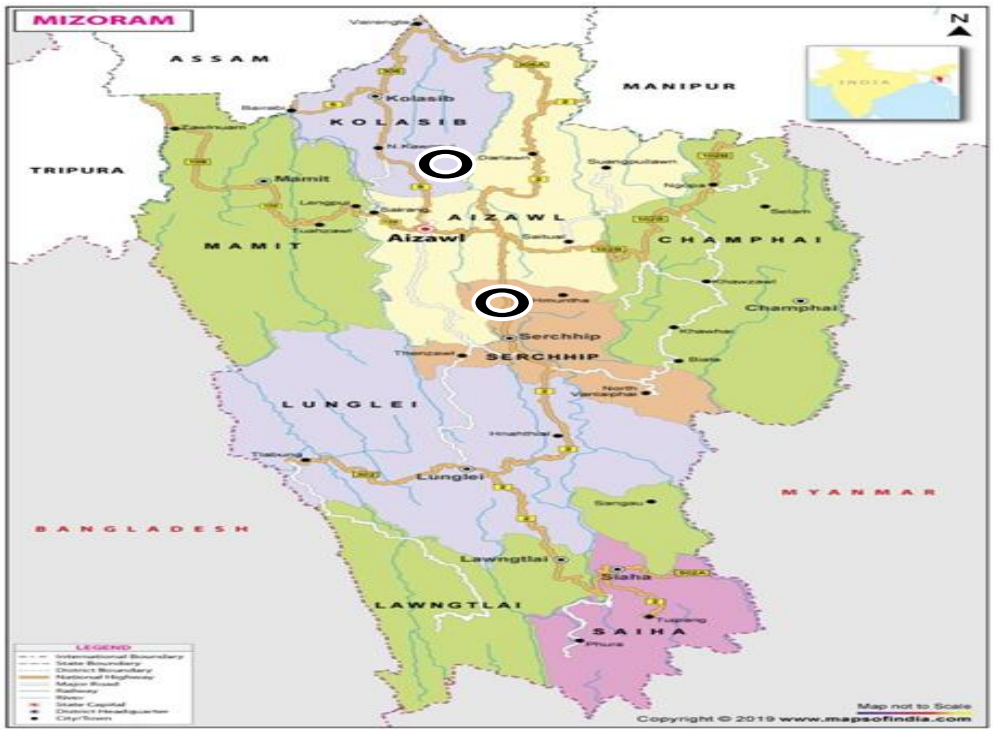

Figure 1: Geographical map of study areas

Plate 1: Plants used by the tribal women farmers in Mizorum state, a) *Clerodendrum colebrookianum*, b) *Clerodendrum infortunatum*, c) *Diplazium esculentum*, d) *Dysoxylum gobara*, e) *Parkia roxburghii*, f) *Senegalia pennata*, g) *Trevesia palmata*

CONCLUSION

There is a lack of proper study on how these plants helped in ecosystem services like increase in soil fertility, act as pest/ insect repellent and their nutritional value. There is an urgent need to develop the protocol for mass multiplication of these wild plant species, so that this can reach to maximum farmers women for domestication and to reduce pressure on the forest. Home gardens/ Kitchen gardens are the laboratory for these women farmers, where they try to domesticate various wild plants those are used as foods as well as medicines. These women are conserving public good at a personal cost. There is an urgent need to identify such unsung heroines of Mizoram state and recognise & reward them for their selfless effort in conservation of Biodiversity.

ACKNOWLEDGEMENTS

The authors would like to pay sincere gratitude to NRLM, MoRD, Govt. of India for providing necessary financial support to carry out the study. We would also like to thank the management of NRLM (RC) Guwahati, Assam for providing necessary

logistical support. Our sincere thanks go to Madam H. Lalchhandami, CEO of Mizoram State Rural Livelihoods Mission for her kind administrative support during the study. A special bunch of thanks goes to the tribal women farmers of Mizoram, for their selfless effort in conserving, maintaining and judiciously using the local plant biodiversity. Our sincere gratitude goes to Mr. Alok De, Lead- Farm Livelihoods, NRLM, MoRD for his constant guidance and encouragement in studying the traditional knowledge systems of India.

REFERENCES

Angami T, Bhagawati R, Touthang L, Makdoh B, Nirmal N, Lungmuana L, Bharati K, Silambarasan R and Ayyanar M. (2018). Traditional uses, phytochemistry and biological activities of *Parkia timoriana* (DC.) Merr., an underutilized multipurpose tree bean: a review. Genetic Resources and Crop Evolution. 65: 679-692.

Anonymous, Forest at a glance, FSI India State of Forest Report, Department of Environment & Forest, Govt. of Mizoram, 2011.

Hazarika TK, Lalramchuana and Nautiyal BP. (2012). Studies on wild edible fruits of Mizoram, India used as ethno-medicine. Genetic Resources and Crop Evolution. 59: 1767–1776.

Kar A, Bora D,Borthakur SK, Goswami NK and Saharia D. (2013). Wild edible plant resources used by the mizos of Mizoram, India. Kathmandu University Journal of Science, Engineering and Technology. 9 (1): 106-126.

Khomdram SD, Fanai L and Yumkham SD (2019). Local knowledge of edible flowers used in Mizoram. Indian Journal of Traditional Knowledge. 18(4): 714-723.

Laha R, Lalhriatpuia, Lalmuanpuii R, Ralte L and Lalremruat PC (2018). Diversity and ethnobotanical uses of wild edible fruits in Mizoram, northeast India. International. Journal of Pharmacy and Biological Sciences. 8(2): 132-142.

Lalfakzuala R., Khongsai M., Kayang H. and Kharbuli B (2012). Ethno-Medicinal plants and their uses in western Mizoram. In edited book: Biodiversity of North-east India (Kharbuli B *et al* eds). North East Hill University, Arunachal Pradesh.

Lalramnghinglova H. (2016). Documentation of medicinal plants based on traditional practices in the Indo-Burma hotspots region of Mizoram, North East India. Emerging Life Sciences and Research. 2(1): 10-45.

Lalremruata J. (2012). Studies on Non-Timber Forest Products (NTFPs) of plant origin and livelihood strategies in northern Mizoram, India. Thesis submitted to University of Mizoram. Pp 1-229.

Noraini MT, Norhayati I and Jamilah MS (1996). The effectiveness of *Toona sinensis* (Meliaceae) as insect

repellent. Journal of Tropical Forest Science. 9(1): 80-87.

Rahmatullah M, Jahan R, Safiul AzamFM, Hossan S, Mollik MAH and Rahman T (2011). Folk Medicinal Uses of Verbenaceae Family Plants in Bangladesh. African Journal of Complementary and Alternative Medicines. 8:53–65.

Rai PK and Lalramnghinglova H (2010). Ethnomedicinal Plant Resources of Mizoram, India: Implication of Traditional Knowledge in Health Care System. Ethnobotanical Leaflets. 14: 274-305.

Ramachandra L, Lalhriatpuia, Lalremruata PC and Vanlalpek R (2018): Forest wild vegetable used by the Lai tribe in Lawngtlai district of Mizoram, India. International Journal of Life Sciences Research. 6(3): 212-217.

Roy SS, Sudhir Kumar, Sharma SK, Devi AR, Singh NA, Prakash N and Ngachan SV. (2016). Tree Bean (*Parkia roxburghii*): A Potential Multipurpose Tree Legume of North East India. Proceedings of National Symposium on Vegetable Legumes for Soil and Human Health. Pp. 201-208.

Sarke T .(2017). Biodiversity: The Role of Women in North East India. Journal of Research in Humanities and Social Science. 5(7): 71-77.

Sharma HK, Chhangte L and Dolui AK. (2001). Traditional medicinal plants in Mizoram, India Hemanta Kumar Sharma, Lalrampari Chhangte, Ashoke Kumar Dolui. Fitoterapia. 72: 146-161.

Table 1: List of wild plant species those are domesticated by tribal women farmers in Mizoram

Local Name (Mizo)	English Name	Botanical Name	Family	Habit
Phuihnam	East India Glory bower	*Clerodendrum colebrookianum* Walp.	Verbenaceae	Perennial shrub
Phuihnam-chhia	Hilly Glory tree	*Clerodendrum infortunatum* L.	Verbenaceae	Shrub or small tree
Cha-kawk	Vegetable fern	*Diplazium esculentum* (Retz.) Sw	Athyiaceae	Fern
Thingthupui	Dysox	*Dysoxylum gobara* (Butch.-Ham.) Merr.	Meliaceae	Tree
Zawngtah	Tree bean	*Parkia roxburghii*G.Don	Fabaceae	Tree
Khanghu	Climbing Wattle	*Senegalia pennata* (L.) Willd.	Fabaceae	Shrub/ small tree
Kawh-te-bel	Snowflake plant	*Trevesia palmata* (Roxb. ex Lindl.) Vis.	Araliaceae	Tree

Table 2: List of wild plant species those are used as vegetables by tribal women farmers in Mizoram

Botanical Name	Parts used
C. colebrookianum (Plate 1.a)	Tender Leaves
C. infortunatum (Plate 1.b)	Tender Leaves
D. esculentum (Plate 1.c)	Tender Leaves
D. gobara (Plate 1.d)	Tender leaves & Flowers
P. roxburghii (Plate 1.e)	Pods
S. pennata (Plate 1.f)	Leaf Shoots
T. palmata (Plate 1.g)	Flower bud & young fruits

Table 3: List of wild plant species those are used as medicines by tribal women farmers in Mizoram

Botanical Name	Parts used	Diseases
C. colebrookianum	Leaf	Hypertension, diabetes, colic Diarrhoea and Dysentery
C. infortunatum	Root	Fever, Skin diseases, worm infection
D. esculentum	Leaf	Skin diseases, Diabetes, Easy delivery
D. gobara	Leaf	Diarrhoea and Dysentery
P. roxburghii	Pod	Itches and scabies.
S. pennata	Leaf	Indigestion
T. palmata	Leaf	Stomach-ache, Blood pressure