

Traditional Knowledge and its Role in Biodiversity Conservation

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Abstract—*The Indian subcontinent is endowed with rich biodiversity which is a hidden treasure in our country and is crucial for sustainable economic growth, development and welfare. Biodiversity conservation is imperative in the current situation of species loss, global climate change, seed sterility, soil erosion etc. The condition is alarming and if it goes unchecked it would lead to mass extinctions including humans. Tribal groups or indigenous communities are inseparable from nature and they earn their livelihood from there. They are biodiversity protectors and not exploiters. The traditional knowledge possessed by these indigenous communities is an invaluable asset for our nation and also it is responsible for our economic growth. The knowledge forms the basis of the primary health care system of India known as the Traditional system of Medicine or Alternate system of medicine and it has gained much popularity in recent times. Therefore, indigenous communities should be benefited from the knowledge which they share with urban class and be given their rights.*

1. INTRODUCTION

The Indian continent is rich in biodiversity in terms of diverse flora and fauna. The varied agro-climatic conditions make it a suitable place for rich biodiversity. We are fortunate enough to be a part of this diverse nature but we are overexploiting these valuable resources to an extent that in the coming times we are going to face consequences at global level such as global warming followed by mass extinction. The solution to this increasing problem lies in conservation at in situ and ex situ levels.

Since ancient times, we have observed and read in scriptures about the role of tribal populations in forest conservation. They are closest to nature and their survival, existence, livelihood is dependent upon forests. These ethnic groups utilize forest resources in a sustainable manner [1].

According to anthropological data on linguistic basis, there are over 104 million tribal people in India belonging to 705 indigenous groups [6]. These indigenous tribes are inseparable from nature and its surroundings and they play an important role in conservation and management of biodiversity in their areas. They are well known as forest dwellers and utilize wild edible plants, leaves, flowers, tubers and fruits as food and for other purposes. Tribals never overutilize forest produce, timber and fuelwood however they use only minor

forest produce (MFP). These communities have been sustaining in forests since ages and have developed a kind of close association with forests. Plants and trees have greater importance in the life of tribals not only for economic purposes but also from the point of their social and cultural importance in preserving the age-old tradition of tribal people in the area. The occupations of tribals have included hunting-gathering to tribal societies with settled life and culture. Among these ethnic groups, depending on their population they have been categorized into major and minor tribes and each tribe has its own livelihood pattern.

2. INDIGENOUS PEOPLE AND TRADITIONAL KNOWLEDGE

Traditional medicine (TM) is defined as “the sum total of knowledge, skills and practices based on the theories, beliefs and experiences indigenous to different cultures that are used to maintain health, and also prevent, diagnose, improve or treat physical and mental illnesses” [5, 7]. Traditional medicine is often being referred to as an alternate system of medicine. Vast knowledge about traditional medicine has been compiled in our upanishads, samhitas and vedas by our ancestors and gurus but still the information has to be spread out to a large section of people. Traditional medicine has often been known as ‘folk medicine’ as it has its roots with indigenous groups and is not well disseminated and thus being considered as a minor component of health practice. However, during the last three decades, awareness among the masses regarding complementary medicine and its minimal side effects has enabled its resurgence and in coming times it will be the most popular form of medicine in the primary health care system.

3. TRIBALS AND ENVIRONMENT

The ethnic communities are a part of nature and they worship nature and its resources. They respect, manage and conserve biological resources by expressing them through ancient scriptures and oral traditions in the form of myths, legends and stories. They have been involved in inculcating the habit of biodiversity conservation gained from their forefathers to the future generations. Ethnic communities protect natural resources by connecting them to religious belief or

considering them as abodes of God. Since time immemorial, tribal communities of India live in various eco-geo climatic regions comprising hills, forests, rivers and natural wealth [2, 5].

They even protect the environment considering it as their responsibility towards their ancestors because they believe that their ancestors live in nature and reside in natural objects. The tribal communities conserve and preserve their environment through traditional knowledge and their wisdom. One of the well known example of human and animal coexistence comes from the 10,000 year old cave paintings at Bhimbetka in Madhya Pradesh, Central India. Most of these paintings depict animals like bison, boars, horses, and lions while others depict the culture of the early Homo sapiens, their festivals, rituals etc.

4. CONSERVATION OF BIODIVERSITY BY INDIGENOUS COMMUNITIES

Traditional knowledge or Indigenous knowledge informs about the various ways in which tribal groups conserve and manage biodiversity [2, 9]. It can be studied under different headings-

- **Plants as food source-** Diversity of plants conserved by tribals as wild fruits, seeds, bulb, roots and tubers for edible purpose. Majority of tribal communities depend upon such food plants in the absence of conventional food, for e.g. *Fagopyrum esculentum*, *Fagopyrum tataricum*, other millets are consumed by inhabitants of Himalayan zone, *Ficus glomerata* is eaten by the Abujhmaria tribe of the north western part of Baster etc.
- **Plants protected in their natural habitat and possess healing properties :** - The traditional knowledge possessed by indigenous communities which they have acquired from their ancestors for the cultivation of medicinal plants and their utilisation for treatment. Plants such as *Ricinus communis*, *Datura metel*, *Jatropha curcas*, *Tinospora cordifolia* are conserved, propagated and used in muscular pain treatment, cure of fever, headache, and body swelling.
- **Conservation of horticulturally important tree species during Jhum cultivation :** These tribal groups are known to practice shifting cultivation and during this practice they do not perform complete felling of trees but they retain several horticultural important species such as *Syzygium cumini* (Jamun), *Grewia asiatica* (Falsa), *Mangifera indica* (Mango), *Citrus sps.* (Orange), *Musa sps.* (Banana) etc.
- **Plants considered as abode of Gods** - Plants growing in nature are conserved in their natural habitat by relating them to their ancestors or considering them as abode of gods. The tribal culture has been studied in Central India, Dindori and Balaghat districts of Madhya Pradesh, Bilaspur districts of Chattisgarh state etc. The following

plants have been related to gods- Aam, (*Mangifera indica*)- Lord Vidhyadhara, Arjun, (*Terminalia arjuna*)- Lord Brahma, Tulsi, (*Ocimum tenuiflorum*)- Goddess Lakshmi, Lemon (*Citrus limon*)- Lord Brahaspati.

- **Endangered species conservation in Sacred Groves** - The ethnic people have played a vital role in preserving the biodiversity of several mini forests and have conserved flora and fauna in sacred groves. One such significant tradition of nature worship is that of providing protection to patches of forests dedicated to deities or ancestral spirits. These vegetation patches have been designated as sacred groves. These places are biodiversity rich, have endemic and endangered species.

5. SACRED GROVES: *IN SITU* CONSERVATION METHOD

Sacred groves represent a complete ecosystem which is conserved and protected by indigenous communities by relating the diversity rich patch of forest by adhering to taboos related to sustenance of the ecosystem. Sacred groves are the rich source of a variety of medicinal plants, oil yielding plants, fuel wood, millets etc. and gives us information about the interrelationship between the biological organisms including us with the surrounding environment [1].

Some examples of sacred groves, also known as community conserved areas, include one that is maintained by the Khasi tribe of Meghalaya. They manage their local environment through their traditional belief system [4].

Another important example is Orans in Rajasthan which show rich biodiversity in terms of grassland, trees and bushes with small water bodies. They are perfect grazing ground for animals and supports the livelihood of local herders. Other example include Kavu's in Kerala. These groves represent places where people worship nature alongwith their dieties. They have been conserved by local people for their cultural and religious beliefs.

Therefore relating or connecting forest patches with religious beliefs have resulted in expansion of biodiversity and its conservation

Traditional knowledge has formed the basis of the Indian System of Medicine (Ayurveda, Siddha, Unani, Homeopathy) which is the primary health care system in India.

Plant based remedies are considered as the oldest forms of health care known to mankind on this earth. Prior to the development of modern medicine, the traditional systems of medicine that have evolved over the centuries within various communities are still maintained as a great traditional knowledge base in herbal medicines [1]. Traditionally, this treasure of knowledge has been passed on orally from generation to generation without any written document and is still retained by various indigenous groups around the world. Folk medicine is based on the knowledge, skills and

practices based on the beliefs and experiences followed by the indigenous communities to maintain their health. Several herbal medicines have been developed for chronic and acute diseases by utilizing the knowledge of traditional healers. Plants such as *Rauwolfia serpentina* (Sarpagandha), *Allium sativum* (Garlic) have been used in relieving hypertension, Leaf extracts of *Catharanthus roseus* (Periwinkle), *Withania somnifera* have been used in preparation of anticancer medicines since decades.

6. INDIGENOUS PEOPLE AND THEIR ROLE IN CONSERVATION- FEW CASE STUDIES

Indigenous people have long preserved seeds because they have important cultural ties within the community. "There's this very strong relationship that people have with seeds [10, 11, 12]

- Debal Deb is known as the Seed warrior, having spent the past two decades collecting and preserving India's increasingly rare indigenous rice species [10]. The ecologist's efforts have led to the creation of a massive seed bank, housing more than 1,410 endangered varieties. 'Vrihi', live seed bank in Rayagada district, Odisha, is currently South Asia's largest folk rice seed bank maintained by him from where native varieties are distributed free of cost in half kg packets. Farmers who take these packets from Vrihi, have to cultivate them, return one kg next year as proof of cultivation, and later pass the seeds on to other farmers. The rice grown from these seeds can be a commercial product. But the seeds can never be sold. They have to be shared for free only with farmers, not with government institutions or seed corporations.
- Rahibai belonging to Kumbhalne in Ahmednagar's Akola tehsil, Maharashtra - is known as the "Seed woman", who has pioneered a movement to preserve indigenous seeds [11]. She has 114 varieties of 53 crops, preserved in traditional ways. She has formed a self-help group (SHG) named 'Kalsubai Parisar Biyanee Samvardhan Samiti' to conserve native seeds.
- Beej Swaraj (Indigenous seed sovereignty for and by tribal women) - This village with majority tribal families located in the Banswara district of Rajasthan recognize the deep link between crop diversity and tolerance, the Women Empowered Group of Farmers of Vaagdhara Sanstha is striving to ensure that the practice of conserving climate-tolerant traditional seeds continues [12].

Protection of Traditional Knowledge- Indian laws

Traditional knowledge possessed by ethnic groups needs protection as it is a valuable knowledge which can benefit not only for natural resource conservation but also to pharmaceutical companies, livelihood upliftment, research studies, species identification, conservation of threatened and endemic flora and fauna etc. The protection and preservation

of Traditional knowledge is essential for sustainable utilization of resources and maintenance of the environment.

The case of Kani tribe in the forests of Western Ghats in India is worth mentioning in the light of Benefit sharing. During a botanical expedition of scientists from TBGRI (Jawaharlal Nehru Tropic Botanic Garden and Research Institute, Kerala) accompanied by Kani tribals, it was observed that tribal people were ingesting some seeds of plant locally known as Arogyapacha (*Trichopus zeylanicus*). The tribals have used this plant since long to provide them energy and relief from physical exertion. The seeds of the plant were tested for bioactive components and it was found that seeds contained various glycolipids and some other non-steroidal compounds. The Tropical and Botanical Research Institute (TBGRI) in 1987 successfully developed a drug named 'Jeevani'[3]. A contract was established between the local community and TBGRI to equally share the benefits where the institute shares license fees on a 50:50 basis. In addition, 2% royalties from sales go to the Kani tribal community.

Some of the Indian laws which have laid rules and regulations for conservation of biodiversity and protection of Tribal Rights include [3]-

- Protection of Plant Variety and Farmer's rights Act, 2001
- The Biological diversity Act 2002
- The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006.

7. TRADITIONAL KNOWLEDGE DIGITAL LIBRARY-A TOOL FOR PREVENTION OF MISAPPROPRIATIONS OF TRADITIONAL KNOWLEDGE

It is a database compilation of traditional knowledge pertaining to Indian medicine. Traditional Knowledge (TK) is a valuable yet vulnerable asset to indigenous and local communities who depend on TK for their livelihood. The healthcare needs of more than 70% of the population and the livelihood of millions of people in India is dependent on traditional medicine. Globally too there has been renewed attention and interest in the use of traditional medicine increasing its vulnerability to exploitation. Traditional Knowledge Digital Library has overcome the language and format barrier by systematically and scientifically converting and structuring the available contents of the ancient texts in Indian Systems of Medicines i.e. Ayurveda, Siddha, Unani and Sowa Rigpa as well as Yoga, into five international languages, namely, English, Japanese, French, German and Spanish, with the aid of information technology and an innovative classification system for this alternate system of medicine and is known as Traditional Knowledge Resource Classification [8].

8. CONCLUSION

Important points to consider-

- **Recognition of the Rights of the Indigenous People:** For preserving the rich biodiversity of the region, the recognition of the rights of the forest dwellers who depend on the forests is as important as the declaration of natural habitat as a World Heritage Site.
- **Effective Implementation of the FRA:** The government must make an effort to build trust between its agencies in the area and the people who depend on these forests by treating them as equal citizens like everyone else in the country.
- **Traditional Knowledge of the Tribal People for Conservation:** The knowledge shared by indigenous communities about biological resources should be given equal recognition known as Benefit sharing as mentioned in Biodiversity Act, 2002.

Indigenous people are integral to conservation as they relate with it in a more integrated and spiritual way, a sense of respect needs to be developed for these people; their presence helps in the conservation of biodiversity. Tribal people give critical information about the presence of endemic plants in the forest. They play an important role in providing labor in afforestation programs. Tribals play an important role in fighting forest fires too. Certain tribes cooperate with the forest department by giving timely and proper information about intrusion of external people in the forest. Thus, the documentation of traditional knowledge and the role of biodiversity in protecting the rights of tribal people in the country become essential.

REFERENCES

- [1] Bain, W.K. Conservation of Environment through Traditional Knowledge and Wisdom with Special Reference to Beliefs and Practices in Tribal India: An Overview, *Heritage: Journal of Multidisciplinary Studies in Archaeology*, 5 (2017), 224 -243.
- [2] Rai, R. and Naath, V., The role of ethnic and indigenous people of India and their culture in the conservation of Biodiversity, *Proceedings of XII world Forestry Congress*, Canada, (2003),
- [3] Singh, B. P. Biodiversity, tribal knowledge and life in India. *Environment and Social Psychology*, (2017), 2(1), 1–10.
- [4] Prakash, P. V. Sacred structures and their ethnoarchaeological and ethnohistorical significance. *The Eastern Anthropologist*, (2005), 58(1): 61–78.
- [5] Ratha, S. N. Forest-forest dwellers interface: Understanding man-nature relationship. *The Eastern Anthropologist*, (2006) 59(1), 1-13.
- [6] Ministry of Tribal affairs website (2011): <https://tribal.nic.in/Statistics.aspx>
- [7] Che, C.T., .George, V., .Ijnu, T.P., .Pushpangadan, P., Andrae-Marobela, K., Traditional Medicine in *Pharmacognosy : Fundamentals, Applications and Strategies*, (2017), 15-30.
- [8] TKDL Traditional Knowledge Digital Library (2003:)<http://www.tkd.lres.in>
- [9] Arora, R. K. Ethnobotany and its role in the conservation and use of Plant Genetic Resources in India. *Ethnobotany* (1997), 9, 6-15.
- [10] <https://www.telegraphindia.com/my-kolkata/people/debal-deb-the-man-reintroducing-india-to-indigenous-rice-farming-thought-basudha-farm-and-vrihi-seed-bank/cid/1870106>
- [11] <https://dst.gov.in/sites/default/files/SEED%20Mother%20Rahiba%20gets%20Padmshree.pdf>
- [12] <https://www.saveindianfarmers.org/beej-swaraj-indigenous-seed-sovereignty-for-and-by-tribal-women/>