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TRADITIONAL KNOWLEDGE ON PLANT BIODIVERSITY CONSERVATION IN TRIBAL AREAS OF PALI DISTRICT

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ABSTRACT

Indigenous knowledge plays a vital role in the lives of local communities: it is a key element in their food security, health, education, natural resources management and other vital activities. For a number of reasons bio-diversity and associated indigenous knowledge are declining at a rapid rate. In view of its importance for society in general and local communities in particular, it is vital that steps are taken to protect it. Therefore identification and utility of plants and compilation of a database on local information held by the tribes is stressed. The information presented in this article will help disseminate information about traditional methods of conservation of plants in tribal areas of Pali district.

INTRODUCTION

Conservation of plant diversity assumes greater importance when the world is facing unprecedented loss of biological diversity. As per an estimate about 60,000 out of 2, 87,655 species of plants known in the world are facing the threat of extinction. Over thousands of years local people have developed a variety of vegetation management practices that continue to exist in tropical Asia (Pandey, 1998), South America (Gomez & Kaus, 1999), Africa (Getz et al., 1999 and Infield, 2001) and other parts of the world (Albuquerque & Alves, 2016 and Ganesan & Sujarwo, 2018.). People also follow ethics that often help them regulate interactions with their natural environment (Callicott, 2001). Traditional knowledge on biodiversity conservation in India is as diverse as 2753 communities and their geographical distribution, farming strategies, food habits, subsistence strategies and cultural traditions. Cultural landscapes in rural and urban areas and agroecosystems, created by the application of scientific and local knowledge, also support a variety trees, birds, other species and provide opportunity of integration of nature and society (Taylor, 2002).

Conservation of the elements of biodiversity, through the maintenance of sacred groves, tree and/or animal worship and observing taboos on harvesting and hunting of plants and animals is characteristic of many indigenous communities in India (Ramakrishnan et. al., 1998, Guha et al., 1999 Deb & Malhotra, 2001 and Kumar & Dadhich 2013). Protection of a large number of medicinal plants in sacred forests of different parts of India are some of the well documented studies made by Baghel, 2001, Bhandari & Chandrasekhar, 2003 and Pandit & Bhakat, 2007.

A perusal of the literature reveals that there is still an ethnobotanical gap in knowledge about conservation of plants in these regions. The present paper therefore is an attempt to fill this gap. Apart from it some new ethnobotanical uses have also been reported.

Study Area

Pali with an extremely varied socioeconomic and cultural landscape is an important district of Rajasthan. The area of 12,387 sq. km of Pali district is located between 24.45 degree to 26.75 degree North Latitude and 72.48 degree to 74.20 degree East Longitude surrounded by Jodhpur, Jalore, Sirohi, Udaipur, Rajasamand, Ajmer and Nagour districts. A major portion of the district is occupied either by dry open grasslands or by grasslands interspersed with trees and thorny bushes (cf. savanna) capable of drought resistance. Tropical thorn forests are found in arid and semi-arid regions of the district. These extend from western border and gradually merge with the dry deciduous mixed forests of the Aravalli hills and the south-eastern plateau. The most striking geological feature of the district are the Aravalli ranges – the oldest mountain range in the world. These hills ranges possess an abundant population of various tribes like Bhil, Garasia, Meena, Kathodi, Damor and Raika who have been living in harmony with the forests for a very long time. These people are heavily dependent on the vegetation around them for firewood, food, narcotics and

medicine etc. They are mainly subsistence farmers and cannot afford alternative fuels or high prices of modern medicine. Threats to these resources are directly linked to activities such as uncontrolled harvesting (overexploitation, premature harvesting etc.), overgrazing, burning, shifting cultivation and other activities leading to deforestation and habitat destruction. This loss of diversity is accompanied by the loss of indigenous knowledge as the elders, who are traditionally the custodians of indigenous knowledge die without having passed their knowledge on to a younger generation.

RESEACH DESIGN AND METHODOLOGY

Intensive studies were undertaken and field data was collected with respect to diversity, presence of tribals, regeneration of the forest and biotic association. An inventory was carried out and local names, traditional uses and methods of conservation were recorded. Information on the soil and topographic factors of the habitat was also collected. Besides a review of relevant literature, semi-structured, in-depth interviews and participant observations were used in the present investigations.

OBSERVATIONS

A. Traditional Methods of Collecting Medicinal Plants
i. Collection of bark -It is traditionally believed that bark from a tree collected for medicinal purposes should be taken from the east and west facing parts of the trunk only. Bark taken from the north and south faces is believed to be ineffective for curative purposes.
ii. Collection of roots - When collecting roots for medicinal use, all of the roots of the plant are not collected. It is believed that if the entire part of a plant was collected and due to this if that plant perished, then the patient being treated with that plant as medicine would also die.
iii. Use of annuals - When a person collects annuals for medicinal use he cannot remove the plant totally from the site and has to leave behind some individuals of the species at the collection site. It is believed that if a species is completely destroyed in a particular area, then the patient to whom the medicine from the species is administered would also die. Actually this is a method of protection of rare endemic species from extinction.
iv. Use of seeds - Seeds are generally used as a lucky charm, placed in a pocket or hung around the neck or ear. They are rarely administered for medicinal purposes. This limited use of seeds allows the conservation of seeds and propagation of plant species through seeds.

B. Plants protected or planted because they were associated with certain protective or evil properties
Many plants are conserved in their natural habitat by tribals due to magico-religious beliefs that they are habitat of god and goddess. Some of the plants that are being conserved in this way are described below:

1. Aegle marmelos: The devotees of Lord Shiva offer the leaves of this tree to God. This tree is often found near temples and in this way people have tried to conserve it.
2. Calotropis procera: Its leaves are also offered to Lord Shiva while its floral buds are offered to Hanuman. People look after such plants for the continuous supply of both leaves and floral buds.
3. Cynodon dactylon: This grass is important for the Hindus as its leaves are offered to Lord Ganesha.
4. Ficus religiosa: The tree is worshipped during Vishnu and Pitri puja. This tree is believed to be so sacred that no one cuts the tree. This tree is also believed to be the seat of ghosts.
5. Tamarindus indica: Like Pipal, this tree is also believed to be the seat of ghosts. Due to this belief people do not cut these trees in villages and thereby conserve them.
6. Azadirachta indica: Shitala (Cool one) -the goddess of smallpox and the Serpent king are said to inhabit this tree. Being the seat of Shitala-the presiding deity of this disease its leaves are believed to possess a curative effect. If a person keeps a branch of it with him, he is perfectly free from the fear of snakes. The neem tree also has the power to banish evil spirits.
7. Butea monosperma: Its wood is used for producing the sacrificial fire. Its leaves are symbolic of the Hindu Trinity-Brahma, Vishnu and Mahesh the Creator, Preserver and Destroyer of the world respectively. It is considered sacred to burn the dead body of a person with palash wood.
8. Nyctanthes arbor tritis: It is a devine tree because it is believed to have been introduced by lord Krishna from heaven.
9. Diospyros melanoxylon and Vitex negundo are believed to have magical potency and the branches of these plants are used to avert the evil eye, repel evil spirits and other evil influences from standing crops.
10. For the Bishnoi community felling of Prosopis cineraria is a taboo. The bishnoi community people have traditionally managed forests collectively. They establish rules and regulations for sustainable use, grazing, and harvesting of forest resources. These community- based management systems help conserve local plant species and ensure their long-term survival.

C. Storage Strategies Adopted By Farmers

The tribal communities, cultivate a few species of crops which are drought resistant and to some extent disease resistant and pest tolerant. These gene-rich crops have been conserved and enhanced genetically due to the conservation habit of these communities over the years.

i. Storing seeds of crop species

Ear heads are left on the plant to allow full growth and only then are they harvested and stored. This practice prevents disintegration of seeds. Maize ears are suspended under the roof above the cooking stove. A mat

made of reed and bamboo is kept below the ears to prevent the flame from reaching it. The smoke keeps the pests away.

For common millet, a portion of the crop is left to attain maximum growth and to dry in the field itself. After harvesting their crops, tribes set aside a considerable quantity as sowing material. This seed material cannot be used for consumption. Tribals borrow food from other members of the community or they substitute other edible resources from the forests in case of shortage of crops. Their traditional way of storing in indigenous granaries has helped to maintain the viability of the grains indirectly. These granaries keep off rodents and pests.

The thatching material is from wheat straw, Leptadenia pyrotechnica and Clerodendrum phlomidis which are highly suitable for local weather conditions. Large air-tight mud-pots a high as 180 cm are also used for storing grains for long periods. Their walls are covered with a plaster of clay, cow dung and hay, making them termite-free (antiseptic). Grains stored inside such a bin do not absorb moisture from air.

Neem leaves are placed over the stored grains to keep them pest- free. Leaves of Azadirachta indica and Vitex negundo have been used to manage the pest in maize. The leaves of Annona squamosa, Azadirachta indica and Eucalyptus globulus have been used for the effective management of pests in pulses e.g. Vigna mungo (kali urad), Vigna radiata (moong), Dolichos uniflorus (kullath) and Vigna unguiculata (chanwala).

The stored product is topped up by dry sifted red soil, which does not allow any infestation to the grains stored underneath. Normally the red soil layer is about 2 to 3 cm thick.

ii. Use of foliar sprays

Since time immemorial cow dung ash has been used for dusting vegetable crops. The presence of ash particles on the foliage deters the defoliator and borer pests. Likewise, sprinkling of mixture of cow dung manure in water on the plant foliage also works as a deterrent against the feeding insects. Locally available plant parts like neem kernels and leaves of jatropha and Ipomea carnea have been traditionally used as botanical pesticides. Pests appearing on the crop are also repelled by spraying a preparation of cow urine and asafoetida in water.

iii Traditional Agriculture Practices

Rajasthan has a rich agricultural heritage with traditional farming practices that support plant conservation. Techniques such as mixed cropping, crop rotation, and organic farming help maintain soil fertility and biodiversity. Farmers also conserve traditional crop varieties, known as landraces, which are adapted to local environmental conditions.

DISCUSSION AND CONCLUSION

By analysing the ethnic communities we can understand that indigenous people control most of the natural forest areas either consciously or unconsciously through their traditional practices and often have strong conservation ethics (Jain, et. al., 2009). The contribution of local knowledge systems in conservation and sustainable use of natural resources is gaining wider recognition (Berkes, 1999, Khandelwal & Shrivastava, 1999 and Kala, 2005). Plants such as Calligonum polygonoides, Tecomella undulata, Commiphora wightii, Anogeissus pendula and Prosopis cineraria urgently require conservation.

Modern science can give a broader perspective to local sustainability but the local people are not likely to readily accept new doctrines thrust upon them in the form of modern environmental conservation strategies, which most of them do not understand. Various disciplines like Genetics, Pollen biology, Tree breeding, Ecology, Botany, Physiology, Ethnobotany, Taxonomy, Phytochemistry, Biometrics, Biostatics should work at one platform and linkages have to be established. Awareness campaigns and training programmes are to be organized in tribal localities for eco -restoration and conserving floras. Conservation of natural resources can be achieved only through the empowerment of indigenous communities and their development.

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