

Sacred Groves as Living Models for Biodiversity Conservation: A Case Study of Kangra District, Himachal Pradesh

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ABSTRACT

Sacred groves represent an ancient form of community-based biodiversity conservation in India, where traditional beliefs, cultural practices, and ecological values have collectively contributed to the protection of natural habitats. These culturally protected forest patches serve as important refuges for biodiversity and provide a range of ecosystem services. Sacred groves support rare, endemic, threatened, and medicinally valuable plant species, while also providing habitat for diverse communities of wildlife, pollinators, and microorganisms. Their multilayered vegetation, continuous litter deposition, and relatively undisturbed soils contribute to nutrient cycling, soil development, carbon storage, and other ecological processes. Dense vegetation and canopy cover help regulate local temperature and humidity, thereby creating favorable microclimatic conditions and enhancing ecosystem resilience. Extensive root systems and vegetation cover also facilitate water retention, groundwater recharge, soil conservation, and erosion control. Beyond biodiversity conservation, sacred groves contribute to carbon sequestration, climate regulation, habitat connectivity, and the sustainable use of natural resources. However, increasing urbanization, developmental activities, invasive species, changing land-use patterns, climate variability, and the gradual erosion of traditional beliefs and indigenous knowledge are placing these ecosystems under increasing pressure. The weakening of community participation and the transformation of traditional nature-based practices further increase their vulnerability.

Keywords: Climate resilient, Food grain, Functional food, Local crops, Nutraceutical

Introduction

Traditional customs, beliefs, and cultural practices have played an important role in biodiversity conservation across human societies (Ramakrishnan, 1998). Sacred groves are forest patches protected through spiritual beliefs and religious faith (Dash, 2005). In India and elsewhere, indigenous communities have historically conserved sacred groves and other natural resources through practices associated with nature worship (Chanda and Ramchandra, 2019). These sites are regarded as repositories of rare, endangered, threatened, and culturally important biological resources, which are protected by local communities because of their association with forest deities (Malhotra, 1998; Yadav et al., 2010). In India, the number of sacred groves has been estimated to range from approximately 100,000 to 150,000, distributed across 19 states (Malhotra et al., 2001). They occur across a wide range of environments, extending from the tropical forests of southern India to the snow-covered Himalayan landscapes of northern India (Malhotra et al., 1999). India is recognized among the world's megadiverse countries and contains biodiversity-rich and highly threatened ecological regions (Myers et al., 2000). The tradition of sacred groves is ancient and is associated with long-standing practices of tree and nature worship. The concept can be traced to the period of the Rig-Veda, when tree worship was widely practiced. Historical and cultural traditions have also linked spiritual life with trees and forests; for example, the Buddha's study and enlightenment are associated with the presence of a banyan tree (Negi, 2005). In the Himalaya, *Cedrus deodara* is particularly revered and is locally known as 'devdaru', meaning the tree of the Gods (Tewari, 1994). Based on their cultural and religious associations, sacred groves may broadly be categorized into three types (Pandey and Rao, 2002): traditional sacred groves, where a village deity is believed to reside; temple groves, established around

temples; and burial or cremation groves, associated with burial or cremation grounds. These sanctified landscapes protect valuable food, medicinal, socio-cultural, and ornamental plant species as well as associated fauna. Sacred groves also conserve medicinal plants that are important for the primary healthcare needs of rural communities and may have relevance to modern systems of medicine (Ramakrishnan, 1998; Sukumaran and Raj, 1999).

Study Area

Jawali is a tehsil located in the northwestern part of Kangra district of Himachal Pradesh. The study area lies at approximately 32°09' N latitude and 76°09' E longitude, with an average elevation ranging from about 365 to 650 m above sea level. The area has a humid subtropical climate, with an average annual temperature range of approximately 12°C to 32°C. Jawala Ji is known for sites such as Jawala Ji Fort, Mansa Temple, and Bathu Ki Ladhi Temple, the latter located within the reservoir area of the Pong Dam. The region is also characterized by considerable biological diversity.

Medicinal Plants Recorded from Sacred Groves of Tehsil Jawali, Kangra

Sr. No.	Botanical Name	Vernacular Name	Family	Part Used	Ethnobotanical Use
1	<i>Achyranthes aspera</i> Linn.	Puthkanda	Amaranthaceae	Leaf	Powdered leaves are used for skin diseases.
2	<i>Adhatoda vasica</i> Nees.	Basuti	Acanthaceae	Leaf	Leaf decoction is used to relieve cough.
3	<i>Murraya koenigii</i> (Linn.) Spreng.	Gandhla	Rutaceae	Leaf	Leaves are chewed to help relieve acidity.
4	<i>Opuntia dillenii</i> Haw.	Chhu	Cactaceae	Stem	The stem, together with rock salt, is considered a n appetizer.
5	<i>Oxalis corniculata</i> Linn.	Malori	Oxalidaceae	Leaf	Leaf paste is applied to treat pimples.
6	<i>Plumbago zeylanica</i> Linn.	Chitra	Plumbaginaceae	Bark	Bark paste is applied to wounds to promote healing.
7	<i>Thevetia nerifolia</i> Juss.	Mako	Solanaceae	Flower	Flowers mixed with olive oil are traditionally used for itching.

8	Woodfordia fruticosa	Dhavi	Lythraceae	Flower	Flower decoction is used for body weakness; powdered flowers are prescribed traditionally for dysentery.
9	Xanthium strumarium Linn.	Chanjir	Asteraceae	Fruit	Fruit ash mixed with honey is traditionally given for cough in children.
10	Zizyphus jujube Lamk.	Ber	Rhamnaceae	Fruit	A decoction of dried fruit, together with Cordia dichotoma, cumin, and cardamom, is traditionally used for cough.

Conclusion

The present study highlights the rich diversity of medicinal plants associated with the sacred groves of Tehsil Jawali, Kangra district, and demonstrates their importance as community-based models of natural-resource conservation and management. These sacred landscapes preserve plant diversity while maintaining traditional ethnobotanical knowledge and cultural values. However, sacred groves are increasingly threatened by urbanization, tourism, industrialization, encroachment, and broader social and economic changes. Modernization, privatization, liberalization, and globalization may contribute to the gradual erosion of the cultural values and traditional practices that have historically supported their protection. As a result, many sacred groves are experiencing progressive degradation. There is therefore an urgent need to strengthen community participation, document and transmit traditional ecological knowledge, and implement effective conservation and management measures to safeguard these ecologically and culturally important landscapes for future generations.

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