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Deo-rahati: An Ancient Concept of Biodiversity Conservation

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Abstract

Conservation of Deo-rahati (*sacred grove*) *in India has ancient roots from Vedic period. Even in modern days ethnic groups conserve religiously preserved forest patches through their customs, taboos, and local festivals associated with the deities. Therefore, these forest pockets serve the vital function of conserving biological diversity and natural water streams. There is an urgent need of awareness and plantation around the sacred groves to fulfill the need of local people and provide protection to sacred groves.*

In Vedic literature, the term *aranyakas* means forest, where life of the hermit was peaceful. The *tapovana* was a special place in the forest used for meditation. Both *aranya* and *tapovana* are known as *abhayaranya* or sanctuaries, where kings and commoners visited to seek the wisdom, blessing, and guidance of the sages. Ancient Indian civilization was cradled in the forests and abodes of saints and sages were epitomes of man's inherent concern for other forms of life. The groves, pools, and ponds were sanctified in ancient time and are still revered as religious symbols of the past.

Overview

Vrikshayurveda means the science of plant life, which is known to have existed in ancient India as a special branch of knowledge. This traditional text mainly deals with practical aspects of plant science. Parashara's Vrikshayurveda (c. 400 BC) is a full-fledged treatise covering some basic aspects of plants. Parashara's chapter of *Bijotpatti Kanda* mentions *Vanavargasutriyani*, which deals with forest regions. Forests are connoted by different terms such as *atavi, bipina, gahana, kanana, vana, maharanya,* and *aranyani.* Parashara has described forests where trees, shrubs, creepers, and grasses grow naturally. *Caitraratha Vana* means beautiful sylvan tract frequented by *Devas* (gods) and *Gandharvas* (heavenly persons). The classification of *Vana* is according to the regions; *Kalaka Vana* is situated on the west

of *Caitraratha Vana*, adorned with the *Manasarovara* (verses 8–9). On the eastern side lies *Kirata Vana* with the river *Hladini* (Brahmaputra) flowing through (verse 10). These three forests are located at high altitude of Himalayas. *Sahyadri* hill region has *Aparanta Vana* spreading up to *Bhrgu-Kaccha* (the Kutch of Gujarat) (verse 18). *Saurastra Vana* belongs to *Avanti* and *Dwaravati* (verse 19). These woodlands were characterized according to their location and natural surroundings. The vegetation in these forests is influenced by the soil characters and plant variation occurs with the diversity of season (verse 20) (Sircar and Sarkar, 1996).

Kautilya's Artha-sastra, the well-known manual of administration, dating back to the 4th century BC, advocated establishment and strict protection of forest reserves and specially highlighted the concept of forest preservation. Kautilya categorized forests as *Pashuvana* (forest for cattle and other such animals), *Mrgavana* (deer forest), *Dravyavana* (forest for timber-yielding trees and other economically important plants), *Hastivana* (forest for elephants), *Paksivana* (forest reserved for birds), and *Vyalavata* (forest for tigers and other wild animals). Kautilya elaborates that the *Dravyavana* and *Hastivana* are sources of natural wealth. He also instructs the king to establish the following forests in the uncultivable land:

- *Vivita* – grassland for cattle;
- *Brahmaranya* – forest where the Brahmins can continue their studies of the Vedas and other scriptures;
- *Somaranya* – forest fit for carrying out religious sacrificial rites;
- *Tapovana* – forest for construction of hermitages of the ascetics.

Kautilya's classification of forests is apparently based on the concept of reserve forests by different means. It indicates that the conservation of biodiversity was an important aspect in ancient period. Some flowers, plants, and forests were declared as abodes of gods and demigods. Most of the forest dwelling tribal societies considered certain part(s) of each forest as the abode(s) of spirits and gods. Perhaps these help in protecting the wild plants and animals from poaching and other forms of vandalism (Sensarma, 1998).

Nature conservation through a religiously preserved forest pocket is known as *Deorai* or *Deo-rahati*, which means a sacred grove (Kosambi, 1962; Gadgil and Vartak, 1976). *Devavana-raji* is a sanctum sanctorum usually situated in remote places. These sacred places are well documented and much praised in Sanskrit

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literature. The word *Dev-rai* is apparently from the Sanskrit word *Devaraji*. Sacredness is also attached to aspects of nature like valley or tree, as is evident from the terms *Devadroni* or *Devadaru*. The *Raghuvansa* verse tells us that *Devadaru* was deemed child of Lord Shiva and the Shakuntala passage narrates that King Dushyanta was prevented from killing the deer and other herbivorous animals of the hermitage. These are evidences of plant reverence and animal reverence, respectively. Sanskrit literature abounds in testimony of environmental awareness in ancient India. Kalidasa, in his play *Vikramorvanshiyam*, narrates how his heroine Urvashi was transformed into a climber on accidentally entering the grove of Kumara, the misogynic son of Shiva and Parvati. Our ancient sculptures also depict sacred plants and animals. Most of the aborigines worship '*naga*', which means a cobra. One can see sculptures of *naga* associated with Hindu gods, e.g., as a garland of Shiva and a bed or canopy for Vishnu (Kosambi, 1974). There is a wealth of information on wild plants used in ancient Indian literature. Aborigines knew about the snakeroot plant, *sarpagandha* (*Rauvolfia serpentina*) at least 3000 years ago and used to treat several diseases such as mental disorders, insomnia, and snakebite (Sinha, 1998).

Different species of trees also have special association with particular deities: *bel* (*Aegle marmelos*), *rudraksha* (*Elaeocarpus sphaericus* – seeds), and *ber* (*Zizyphus mauritiana*) are considered dear to Lord Shiva, *sal* (*Shorea robusta*) and *pipal* (*Ficus religiosa*) to Lord Vishnu, *kadamba* (*Anthocephalus cadamba*) to Lord Krishna, *amra* (*Mangifera indica*; mango) to Lord Hanuman, *ashoka* (*Saraca asoca*) to Kamadeva, *semur* (*Bombax ceiba*; silk cotton) to Goddess Lakshmi, and *shriphala* (*Cocos nucifera*; coconut) to Varuna (Venkatachalam *et al.,* 2005).

A large number of sacred groves are located in India (Fig. 1). The Indira Gandhi Rashtriya Manava Sangrahalaya (IGRMS), Bhopal, Madhya Pradesh has reported the existence of more than 100,000 sacred groves in India (Pandey, 2000). These forest patches exhibit variations in the purpose of their establishment and relate to social, cultural, and environmental aspects. Also, these forest patches harbor huge trees and giant climbers, and serve as repositories of rare, endangered, and endemic plant species. The term "remnant vegetation" is broadly used for traditional conservation of native vegetation that occurs within fragmented landscapes. "Remnants" are generally small to medium-sized patches of vegetation surrounded by highly modified land, such as cropping or grazing lands. "Remnants" are often referred to patches of trees, shrubs, and huge climbers (Carle and Mike, 1997). However, "remnants" may also be used to describe any fragmented native ecosystems preserved for religious purpose. This practice of dedicating forests to deities was once spread throughout the Old World.

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Figure 1. The sacred grove *Kalubaicha Rahat* in Junnar, Pune district, Maharashtra.

Greek mythology tells us about the groves of Diana. Groves serve as sites for initiation of ceremonies, spiritual rites, female circumcision, and training grounds for herbalists. These groves are protected against encroachment. Access is only to members of the respective secret society. The flora and fauna of these sacred groves are protected under sanctions and taboos, which provide limits to overexploitation (Lebbie and Guries, 1995).

A "remnant" may be viewed as both a relic of natural ecosystem and a product of existing land-uses and management practices. In many cases, it is useful to recall that a "remnant" exists only because of prior decisions made by the landholder or local people. Indeed, "remnant vegetation" might be considered a stand of native vegetation that reflects current and past management practices. Hence, conservation of "remnant vegetation" can be perceived as securing and adapting existing management practices rather than imposing a new management regime (Kulkarni and Upadhye, 2006).

In Maharashtra, several groves are dedicated to ferocious deities such as *Bapujiboova, Kalubai* (Fig. 2), *Navlaidevi, Mariai, Andharidevi, Kadjai, Dongraidevi, Jakuradevi, Kalkai, Kalbhairi, Vanghrunjai, Gulumbai,* and *Chiraidevi*. However, there are sacred groves, which are dedicated to deities that are not thought to be of ferocious nature such as *Maruti, Ganpati,* and *Khandoba.*

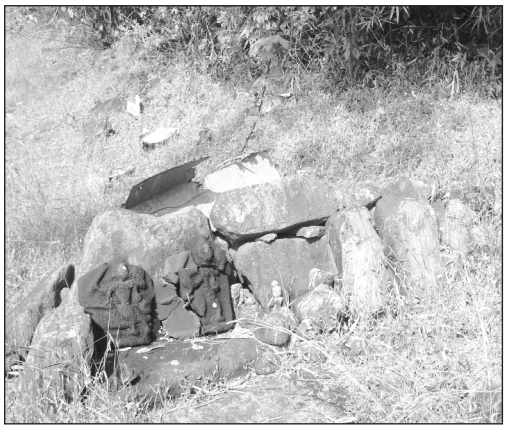

Figure 2. Stone idols of the ferocious deity *Kalubai* outside *Lawarde* sacred grove in Maharashtra.

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Local and tribal people are maintaining these groves against all odds and disasters (Kulkarni and Kumbhojkar, 1999). Roy Burman (1991) conducted a survey in four villages of Ambegaon taluka of Pune district in Maharashtra and recorded observations on deities, clans, and cultural and social relationships with sacred groves in the Mahadeokoli tribe. Kulkarni (1992) collected information on ethnobotany of Mahadeokoli tribe and sacred groves from tribal pockets in Pune, Raigad, Nasik, Thane, and Ahmadnagar districts of Maharashtra. Developmental activities in this area cause threat to most of the sacred groves. Kulkarni (2005) reported the displacement of local people from the regions due to construction of four dams in Rajgurunagar, Ambegaon, and Junnar taluka of Pune district. Major deities such as *Vanadeo, Vaghoba, Vira,* and *Varsubai* are believed to dwell in this region. The religious and cultural beliefs are centered around gods and goddesses. The principal deity of the Mahadeokoli is *Maruti*. The forest male gods are *Vaghoba, Vira, Cheda, Bhiroba, Khandoba, Vetal, Mhasha, Chevata,* etc. The deities may be installed in the forest patch or even under a single tree. Female deities include *Kamaljai, Mariai, Bhavani, Bhagvati, Tathawade*, etc. There is some social relevance with the forest deities. *Vaghoba* is a forest god of all the villagers and they collectively worship the deity in the month of *Chaitra* (April) and sacrifice hens and goats. *Vaghoba* worship is to ensure that the tigers cause no harm to the people and their animals. The Mahadeokoli used to attack the *Gavali* (cowherds) and the *Ghadashis* (low caste musicians). The displacement of the *Gavali* and *Ghadashis* was continued for long years. In the memory of *Gavali* they maintain *Gavali Deo* sacred grove in Madh area of Junnar taluka. The deity *Viroba* resembles the *Shiva linga*. There are two bull sculptures made of stone in the forest of *Viroba*. A stone image of a '*Vir*', meaning physical strength, is also placed nearby. The forest female deity *Kalamjai* is supposed to protect the entire village from external evil spirits or any infection or epidemic disease. The Mahadeokolis collect dried wood after seeking permission from forest gods by a worship method called '*Kaul.*' If the rituals are not followed, it is believed that people may fall sick or die or be bitten by snakes. Dry wood may also be utilized

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for community use such as construction of common temple (for community feasts), schools, and village panchayat building. These sacred groves and deities are worshiped by the Mahadeokoli on various occasions.

Nipunage *et al*. (1993) surveyed the Sinhagad Hills[1] in Pune district during 1985–86 for plant collection and reported seven sacred groves from the area. They described sacred groves from each *dara*; i.e., *Bapujiboovahe ban* (*Thorala Dara*), *Kadjaichi rai* (*Kadjai Dara*), *Kalubaichi rai* (*Potfuga Dara*), *Mahar rai* (*Mahar Dara*), *Navlaichi rai* (*Navlai Dara*), and *Sitabaichi rai* and *Zipari Kalubai* (*Sitabaicha Dara*).

Sagdara, in Pune district, is a religious forest preserved for the village deity *Khandoba*. The older villagers are unable to predict the precise age of the grove. They could only say that it is being preserved for generations without any disturbance. The deity *Khandoba* was established by a monk at *Sagdara* in the ravine under two *sag* (*Tectona grandis*; teak) seedlings growing side by side. Due to the sacred congenial environment in the ravine, other seedlings of *sag* started growing and now the forest predominantly consists of more than 200 *sag* trees (Nipunage *et al*., 1988). There are strong restrictions against the lopping or cutting of trees inside the religious forest preserved in Panshet water catchment area (Vartak and Gadgil, 1981).

1. The Sinhagad Hill has eight spurs descending towards south and north from the top plateau. The spur is called *dand* and the ravine in between is called *dara*.

Folklores associated with sacred groves

Folklores play a major role in confirming beliefs about cultural heritage of sacred groves. The primitive tribal population is ignorant about the art of writing and reading. The tribal people have scrupulously preserved their traditions, customs, rituals, ceremonies, and ways of forest life through folklores. Such traditions always suggest do's and don'ts, conventional norms in everyday life and in society, and how to behave with nature under various circumstances. The folklores also point out rewards and blessings for good behavior or act, and heavy punishment for the atheist or infidel. We have recorded several such folklores depicting various facets of life and culture of the aborigines.

The deities generally demand animal sacrifices. The cult spots are rarely within a village but lie at a distance of at least half km. Kosambi (1962) discussed these features of the cult as primitive, dating from the hunting-gathering stage of the society. The villages are inhabited by male Gods such as *Maruti*, who lives tamely in a temple and is happy with the offerings of coconut.

Smearing of Goddess with *shendur* [mercuric oxide (red)] represents the blood of sacrificial victims. These victims were no doubt humans in bygone days. Even today Goddess *Shirkai* in the village *Shirkoli* in Pune district is symbolically offered a human victim every year. Kulkarni and Shindikar (2005) evaluated *Shirkai* sacred grove and investigated the

floristic composition in detail. The grove comprises 116 species from 54 families and 106 genera. A general composition and richness of flora at family, genus, and species levels was prepared. Eighty-five clumps of *Bambusa arundinacea* were dominant in the sacred grove.

There are a number of folklores on reprisal of forest spirits for unauthorized hunting in the sacred groves. In *Dapsar* grove in Pune district, a man tried to smoke out a monitor lizard (*Varanus bengalensis*) from the hole in a tree trunk, the tree caught fire accidentally, and the lizard disappeared. The person felt violently ill and escaped death by placating the deity with sacrifice of a goat. Once a worshiper from *Dapsar* decided to construct a temple for the God. The forest spirit would not tolerate that the wood for the temple was being procured by felling a tree within the sacred grove. The worshiper nevertheless decided to take a chance and started felling *jambul* (*Syzygium cumini*) tree for timber. The tree came down much before it was expected and instantaneously killed all the tree woodcutters.

The protection to the present sacred groves was offered by beliefs in omniscience and power of local deities, complemented by enforcement of the deity's will as interpreted by priests, locally called *Bhagats*. The beliefs in supernatural powers and the local deities are weakening. Some local communities like the Mahadeokoli are socially homogeneous and they believe in the supernatural power of local deities (Kumbhojkar *et al.*, 1996). Such sacred groves are not felled either by political pressure or by other authorities.

Conservation of biodiversity in natural forests through preservation

Nature conservation is deeply embedded in the cultural ethos of the Indian society. Habitat and individual species conservation has been practiced since time immemorial. The pioneering work in the world on conservation measures dates back to 300 BC when Emperor Ashoka's benevolence extended to all living creatures. Since ancient time, forests have been abodes of saints and sages; the groves, pools, and ponds are still venerated as religious symbols of the past.

There are other guidelines for protected landscapes, resource reserve, natural biotic area/anthropological reserve, multiple use management/managed resource area, biosphere reserves, world heritage site and scientific reserves, etc. The main objective of biodiversity conservation is to conserve diversity of flora, fauna, micro-flora, and micro-fauna. One of the important strategies is to conserve total biological diversity and study the processes of natural succession in various forest types of the country (Khullar, 1992).

Ambaichi rai in Patan taluka of Satara district in Maharashtra is an example of natural forest preservation. Plant species such as *Holigarna grahamii*, *Nothopegia colebrookiana*, *Canarium strictum*, *Gnetum ula*, *Dalbergia horrida*, and

Jasminum malabaricum are preserved. The vegetation in the sacred grove stands in stark contrast with that in the surrounding areas, where a dry patch or scrub type of forest is observed. Some temperate plants are found in this sacred grove on higher crests of Sahyadri mountains. This is due to the fact that all the parts between Himalaya and Sahyadri have been completely eroded and washed away. This hypothesis is surmised that once upon a time they must have had continuous vegetation of temperate plants, but the softer part of the traps between them got disintegrated and got transported leaving the harder parts intact. As a result, the temperate plants between the mountains disappeared and were replaced by the moist deciduous or semi-evergreen species (Mahabale, 1979).

The most important justification regarding nature conservation through *Deo-rahati* or sacred grove is that it provides an insurance policy for the future. It preserves a reservoir of continually evolving genetic material, representative of natural ecosystem. It preserves a reservoir of wild animals, medicinal and economically important plants, and rare, endangered, and endemic plants, which may enable them to be cropped in the surrounding denuded area.

Environmental impact of sacred groves in western Maharashtra

The impact of civilization, acculturation, industrialization, political situations, developmental activities, etc. is threatening the ancient sacred groves preserved on religious grounds. This situation has created awareness among the ecologists, environmentalists, and social scientists. The way of preserving such sacred groves and the natural environment with close participation of local people and efforts for reintroducing indigenous species would be worth following. The selection of species to be planted in the surrounding forest will meet the demand of local people for firewood, fodder, timber, etc.

The sacred groves have presently attracted attention of the environmentalists, geneticists, and botanists for their undisturbed natural conditions, which enable them to become repositories of valuable germplasm of medicinal plants, wild fruit plants, and wild relatives of cultivated plants (Fig 3). These wild species will thrive in different agroclimatic conditions and can be used in breeding programs (Ghate *et al*., 1999).

Trees in sacred groves provide habitat and food for many species of birds, insects, reptiles, and mammals that help to control pest population in the agroecosystem, promote regeneration of tree species by dispersing seeds, and facilitate cross-pollination of many plant species. Thus, sacred groves play a dynamic role in balancing the ecosystem including the agroecosystem of the region.

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Figure 3. *Kalbhiraobache ban* with natural bamboo in *Kolawade* sacred grove in Maharashtra.

In other words, the deep foliage of the groves creates microclimate which permits regeneration and sustenance of biotic species that are not usually found in the surroundings. Religious forest patches can provide ample leaf litter and manure to the surrounding vegetation. Local and tribal people collect leaf litter to enrich their fields with organic manure (Kumbhojkar and Kulkarni, 1998).

Water conservation in sacred grove

Many sacred groves are associated with ponds, streams, springs, or rivers and they serve as micro-watersheds. There are so many temples near ponds or rivers, which are excellent water reservoirs to preserve rainwater and thus maintain the water table throughout the year.

Sacred groves trap the groundwater. The area of the sacred grove in Pal village of Bhudargad taluka of Kolhapur district, Maharashtra is 4.86 ha. The natural water streams continuously supply water to the villagers. The predominant unique tree in the grove is *Bischofia javanica*. In Pune district, *Jakhanichi rai* near Chikalgaon village in Mulshi taluka has the bamboo species *Bambusa arundinacea.* The local people as well as livestock depend on natural water source in the grove in summer. *Ghatai* sacred grove situated in Satara district harbors

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Nothapodytes nimmoniana. A continuous water supply is available to the local people from the grove. This indicates that *Deo-rahati* plays an important role in conservation of water.

Conclusion

Deo-rahati or sacred groves are important for the conservation of biological diversity. Sacred groves have social fence in order to prevent unreasonable exploitation of the resources within these pockets. This social fence is now providing protection to various species of plants and animals inside the sacred groves. Unfortunately, modernization has changed the culture of local tribal inhabitants. Due to westernized urban cultures, the institution of sacred groves conservation is losing its cultural importance among the younger generations of local communities. It is essential to understand the cultural and ecological values of groves for biodiversity management (Bhagwat and Rutte, 2006). These ancient sites can be well managed by planting suitable plant species through agroforestry or social forestry and energy plantations. This will fulfill the need of local villagers and reduce the pressure on the sacred groves. Planting exotic trees in sacred groves should be discouraged and preference should be given to the indigenous species. Limited efforts have been made to develop nursery technique and management practices for native species which are confined to sacred groves. Local villagers or forest people should be trained in raising native plant nursery and these species should be planted in nearby degraded sacred grove areas with the help of local people. The awareness program for sacred grove conservation should be initiated considering the traditional wisdom of the local bodies. There is an urgent need to convert traditional belief of the tribal people into effective conservational values.

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