

Environmental Conservation Through Nature Worship: A Study of Sacred Groves in Pernem Taluka, Goa, India

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ABSTRACT

The school of environmentalism believes strongly in the supremacy of nature and accepts its role in shaping human civilization. Historically, nature worship has been an intrinsic part of human civilization, influencing cultural, spiritual, and ecological perspectives across the globe. However, with the advances in technology, the importance of nature has taken a backseat in these last few decades. But the impact of rapid climate change leading to a great loss of biodiversity, has once again, cast a spotlight on topics like 'preservation', 'conservation', 'sustainability' and 'nature'. All activities are focused on them. This article explores the relationship between nature worship and environmental conservation-examining the significance in fostering sustainability. It highlights the pivotal role such practices play in India, with a particular attention to Goa's traditions. The study emphasizes that nature worship offers profound insights into the conservation of biodiversity.

Keywords: Nature worship, Culture, Spirituality, Environment, Conservation

Introduction

The concept of nature worship, rooted in spiritual reverence for natural elements, has endured across millennia. It represents one of the earliest expressions of humanity's profound respect for the environment. Across diverse cultures and traditions, natural entities such as trees, rivers, mountains, and animals are regarded as sacred, fostering a sense of devotion that encourages communities to assume responsibility for environmental stewardship. These practices embody ancient ecological wisdom, transmitted through generations, and remain highly relevant in the contemporary era—one increasingly defined by pressing environmental challenges.

These practices are purely based on principles of environment conservation which has been mentioned thoughtfully in various scholarly articles (Kandari *et al.*, 2014; Rath and Ormsby, 2020; Sharma and Kumar, 2021). Contemporary environmental literature of Gadgil and Guha (1993) highlights the need for sustainable development. These principles resonate with Indigenous practices, where resource utilization is balanced with ecological preservation. It also reflects the interconnections between spirituality and ecology found in every cultural group. Authors such as Capra and Mattei (2015) and Shiva (1989) argue that spiritual reverence for nature fosters a sense of responsibility, encouraging conservation. This connection is evident

in Indigenous traditions worldwide, where rituals often serve to regulate resource use.

Nature worship has been a universal phenomenon, evidence from ancient civilizations like Mesopotamia, Egypt, and the Indus Valley present widespread practices of nature worship. Ancient literature like Vedic literature in India, such as the Rigveda, mentions the sanctity of natural elements like rivers, trees, and mountains. Nature worship and sacred groves are deeply intertwined in Indian culture. Sacred groves are the patches of local biodiversity preserved and protected by local community through locally relevant rituals and practices for centuries. They are related to ancient spiritual values, customs and rituals found in every Indian state. The most significant outcomes of sacred groves have been the preservation of small natural sanctuaries as it is considered divine and any interference is banned, thus now become the most unique biodiversity hot spot (Bharucha, 2017). The famous examples of sacred groves are Mawphlang Sacred Forest, Meghalaya, protected by Khasi tribe, Amarkantak Sacred Grove, Madhya Pradesh, home to endemic and medicinal plant species.

The ecological significance of the sacred groves can be seen in their role to provide natural habitat to several indigenous species and help as a gene pool of local biodiversity, its association with several waterbodies helps in water shade protection. Bhagwat and Rutte (2006) have pointed out that the richness of the combined species of an area may be found in these groves. Chandran and Hughes 1997; Gadgil and Vartak (1975) mentioned a variety of groves across the Western Ghats have both specialized landscape as well as individual specimens of important tree species. Their spiritual significance is related to worshipping deities and spirit which ensures the protection of the sacred groves.

Goa, with its rich ecological diversity and heritage, offers a microcosm for studying these dynamics. Nature worship in Goa refers to the reverence and respect that people show toward nature, believing that natural elements like trees, rivers, mountains, and animals hold spiritual significance. This practice is rooted in traditional beliefs and local customs and reflects a deep connection to the environment, where people see themselves as part of the natural world and respect it as a source of life and sustenance. Goa has the tradition of the sacred trees. Though many of these trees not having any commercial use and value, have been regarded as sa-

cred, due to their association with a particular deity Kerkar (2016, 2022). It is practiced through rituals, festivals, and traditions that celebrate the sanctity of the natural world. Goan communities have the eco-friendly belief that trees have a life force and need to be conserved and used in a sustainable way.

Many studies have also been done in highlighting the crucial role of sacred groves in biodiversity management (Kandari *et al.*, 2014; Rath and Ormsby, 2020; Sharma and Kumar, 2021). The most common practices of nature worship are through Sacred groves (Devari), a preserved area in forest; worship of trees like banyan (vad), peepal (pipal) and coconut; and worship of rivers. In Goa sacred groves are known by various names, Devrai, Devrann or Pann and often associated with temples, shrines, pilgrimage sites. Thus, the traditional practices offer lessons for modern conservation, emphasizing community involvement and ethical resource use.

Goa's eco-tourism initiatives increasingly incorporate cultural elements, demonstrating the potential for sustainable development. People of Pernem, one of the predominantly rural talukas of Goa, practices various forms of nature worship throughout the year. It has been noted that most villagers collectively maintain sacred spaces and organize rituals, ensuring the sustainability of nature worship practices. The elders, also pass on traditions and the importance of nature worship to younger generations. However, a comprehensive analytical study is essential to highlight the pivotal role of sacred groves in environmental conservation and maintaining ecological balance, thereby raising awareness among the masses about their significance.

In view of this the present study aims to

- to explore the relationship between nature worship in the form of sacred groves and environmental conservation,
- emphasizing shared principles and
- to assess the potential of traditional ecological knowledge in
Informing sustainable development practices.

Materials and Methods

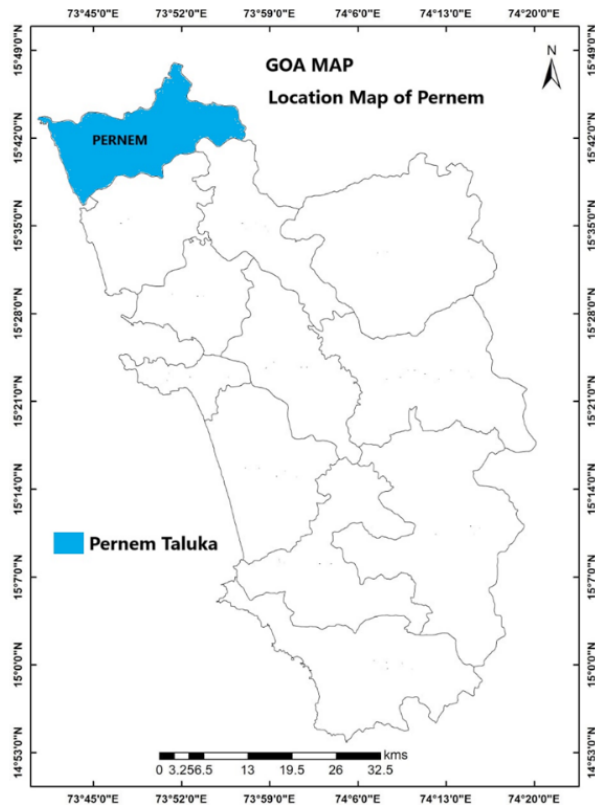
Study area

Pernem is located at 15°43'01" N and 73°47'52" E at an average elevation of 47 meters. Pernem, the northern most taluka of Goa (Map 1). Pernem taluka is surrounded by Vengurla and Sawantwadi and

Dodamarg talukas of Sindhudurga, Maharashtra to the east, Bardez and Bicholim talukas of Goa to the south and Arabian sea on the west. Pernem taluka is located geographically on the slopes of western ghats. The total area of the taluka is 251.69sq.km. Total area under forest is 5.45%. The landform is characterized by plateau, plains, and hills. Total no. of villages in Pernem taluka is 27 (Map 2). As per census 2011 total population is 30,066 in urban and 45681, in rural areas. There are five towns, Arambol,

Mandrem, Morjim, Parcem and Pernem. River Terekhol, a prime river in North Goa geographically separates Pernem taluka from the state of Maharashtra. The relief of Pernem can be explained and interpreted as a combination of plateaus plain and hilly regions with a gentle slope along the plateau areas. Dissected table land and low lateralized plateau are found between the Keri and Harmal village. A freshwater lake is located on the foothills of the dissected tablelands. Another dissected tableland is found separating Mandrem and Morjim village. Pernem taluka is blessed with vast stretches of river and coastal plains. The major coastal plain stretches from Keri village to Mandrem village, dotted with famous beaches of Keri, Harmal, Ashvem, Morjim and Mandrem. Besides, two major rivers bordering the taluka have developed vast river plain comprising alluvial soil.

Goa, surrounded by Arabian sea on the west and the western ghat on the east experiences tropical - maritime and monsoon climate with a strong orographic influence. In Pernem the climate is tropical with notable amount of precipitation during the year. The average temperature of the taluka is 26.4 degree Celsius and average rainfall is 2694 mm. The majority of the rainfall occurs during the month of July with average amount of 874mm. The month of highest relative humidity is July (90.62 %). While January has lowest relative humidity (59.34 %). The wettest month is July, and driest month of the year is February.



Map 1. Location of Pernem Taluka.



Map 2. Village map of Pernem taluka.

Methods

The information pertaining to Sacred groves was compiled from (i) field investigation and (ii) secondary sources (referring Census of India, Statistical handbook of Goa). In this regard information was collected from villagers (100 numbers) of different villages through a well-defined questionnaire. Later collected data have been represented in graphs and tables. The spatial distribution of sacred trees and groves is developed through Quantum Geographic Information System (QGIS).

Results and Discussion

Sacred groves and conservation of environment in Pernem taluka

The present study is focused on conservation of en-

vironment and biodiversity by practicing nature worship in general and the sacred groves in particular in Pernem taluka. The ancient practice of maintaining sacred trees can be considered as the most sustainable way to preserve environment and biodiversity. The vital principles of conservation embedded in this form of nature worship are.

Resource Management: Rituals often include restrictions on resource use, ensuring sustainable consumption.

Biodiversity Protection: Sacred groves and other protected areas contribute to the conservation of endemic species.

The random sample survey revealed people’s deep belief in nature worship, importance of the practice for conservation and need to transfer this cultural practice to the younger generation. Table 1 reflects awareness and importance of nature worship. Larger section of population is aware and practice nature worship indicating strong bonding with nature. The study reveals that worshiping trees is the most widespread practice in the taluka, where 76% of the respondents answered in affirmative (Figure 1). They strongly believe that Sacred trees/groves play a crucial role in conserving and protecting unique and threatened species.

Table 1. Knowledge of Nature Worship

Sl. No.	Nature of awareness	No. of response
1.	Having knowledge of nature worship	89
2.	Not sure about nature worship	11
3.	Total number of people responded	100

Therefore, the present study focuses on Ecological and Biodiversity significance of sacred groves in terms of Habitat preservation, Species diversity and Ecosystem service.

Distribution of sacred groves and tress in Pernem taluka

Sacred groves are restricted areas of forest or woodland that are considered sacred and are often preserved and protected by local communities because of their spiritual, cultural, or religious significance. These groves have been integral to various Indigenous traditions around the world, where they are seen as homes to deities, spirits, or ancestors. Like other parts of Goa, sacred groves and sacred trees are integral to the ecological and cultural heritage of

Pernem taluka. These natural sites are traditionally protected by local communities primarily for religious and spiritual beliefs. However, they also serve as biodiversity hot spots, conserving rare flora and fauna while maintaining ecological balance and thus reflect the deep-rooted connection between local traditions and environmental conservation.

This study examines the number of sacred groves and trees across various villages in Pernem taluka (Table 2). By analyzing their distribution, we can understand the role these sacred sites play in preserving biodiversity and cultural heritage. The study finds that, Korgao village has the highest number of sacred trees (14), followed by Alorna (8) and Ibrampur (8) which indicates strong cultural traditions of conservation in those villages. It is also noted that Korgao and Ibrampur comprises most of the prominent sacred groves (4), followed by Palyem (1), Varconda (1), and Virnoda (1). Villages with higher numbers of sacred groves and trees may function as ecological reserves, providing habitats for flora and fauna, contributing greatly to nature conservation. Maps 3 and 4 show the presence of



Photo Gallery of Scared Groves at Korgao and Arambol Villges

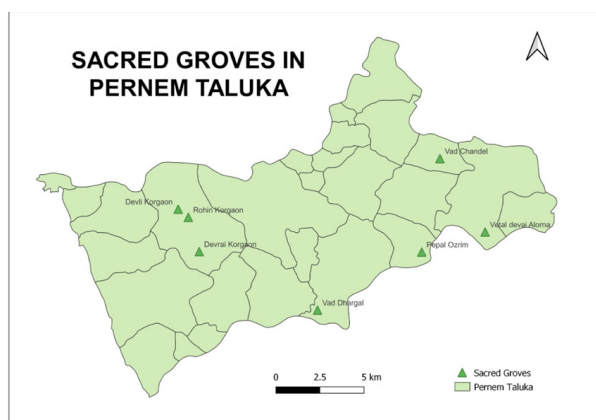


Photo Gallery of Scared Tress at Korgao and Arambol Villges

Sacred groves and trees in Pernem taluka. It can be noted that sacred groves are not present in all vil-lages while few are traditionally preserving them for hundred years. Since, religious belief is primary determent factors behind maintaining the sacred groves and trees, the distribution reflects dominance of Hinduism in those areas.

Table 2. Sacred Groves and trees in Pernem Taluka

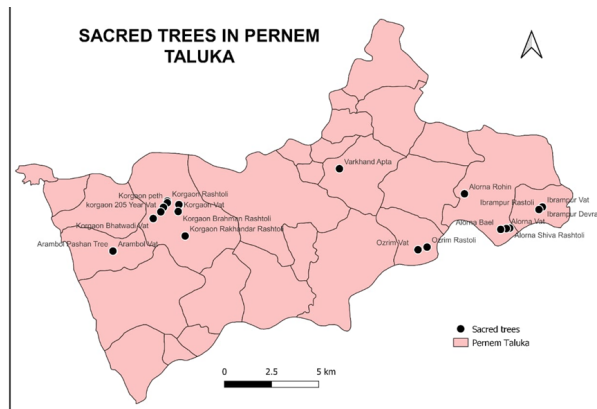
Sl.No	Sacred groves and trees	Number
1.	Sacred trees	64
2.	Sacred Groves	7
3.	Total	71



Map 3. Major Sacred Groves in Pernem Taluka. Maps have been created by using QGIS.

All the sacred groves are considered as biological hot spot as they are home to substantial number of indigenous species. Pernem taluka displays unique biodiversity and diverse ecosystems like forests,

wetlands, etc influenced by the Western ghats and the Arabian sea. Trees like Kazaro (*Strychnos nux vomica*), Kumyo (*Careya arborea*), Jambul (*Syzygium cumini*), Indian fishtail (*Caryoyt asp.*), Vad (*Ficus benghalensis*), Kokum (*Garcinia indica*), Coconut (*Cocos nucifera*), Cashew nut (*Anacardium occidentale*), Mango (*Mangifera sp.*), and many other evergreen plants as well as medicinal plants are found all over the taluka including the sacred groves.



Map 4. Distribution of sacred trees in Pernem Taluka. Maps have been created by using QGIS.

It has been observed that all different species of trees and plants, especially peepal and banyan are found in those sacred groves. Table 3 presents area and species found in different sacred groves in Pernem.

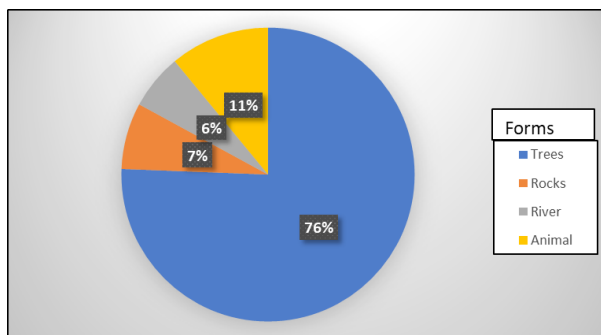
Trees like peepal banyan and others are known to have significant contribution in nature conservation. Various scientific studies support the significant and immense contribution of a single banyan or peepal

Table 3. Sacred groves in Pernem.

Name of the village	Devrai	Area	Plant species
1. Ibrampur	1) Devachi Rai 2) Devachi Rai of Hnkhane 3) Rashtrolyachi Rai 4) Pirapeth of angodwada	-400sq m to 2 acres-400mts	Kindal. Peepal, Mango, Cashew and medicinal plants
2. Palyem	Zalmyachi Rai	NA	Kindal, Mango, Cashew and medicinal plants
3. Varconda	Devachi Rai	-	Kindal. Peepal, Mango, Cashew and medicinal plants
4. Virnoda	Ngardeshwar	-	Ficus Bengalensis, Grcina Indica. Matti
5. Korgaon			Bnnana, Kjro, Bel etc
6. Perne	Mharinganachi rai		Kzaro, Jambul. Kumyo

Source: Sacred groves of Goa, Kerkar (2016, 2022).

tree towards the environment. Besides, these trees have great roles in supporting pollinators and providing traditional medicines. The Table 4 acknowledges the potential contribution of these trees in protecting and conserving the environment of the villages of Pernem taluka for hundreds of years. Each sacred grove is a treasure house of biodiversity as they comprise number of species of plants as well as birds and other animals. The findings of this study emphasize the value of nature worship in fostering environmental consciousness.



Graph 1. Percentage of respondents who worship different forms

The significant findings from the study of sacred groves in Pernem taluka emphasize a deep-rooted practice of nature worship leading to communal

harmony and environmental conservation and habitat preservation. Villages like Korgao, Querim, Paliem, and Ibrampur represent the importance of sacred groves, not just as places of worship but as sanctuaries for biodiversity and communal harmony. In Tamboxem and Tuem, these sacred groves play a crucial role in preserving the natural environment, although specific sites remain undocumented. The survey revealed that each sacred grove is indeed a safe haven for native species, preserving their habitats and allowing them to grow.

Festivals like ‘Van Mahotsav’ and ‘Tulsi Lagna’ are celebrated not just as rituals but as a promise to protect the land. The villages hold rituals around the Tulsi, banyan tree, and springs, symbolizing respect for nature tied to the well-being of the community. The sacred groves at Ibrampur serve as an emblem of religious unity, being respected and maintained by Hindu, Christian, and Muslim communities. This symbolizes a shared cultural heritage that transcends religious boundaries. Across all villages, traditions discourage deforestation, pollution, and harm to natural elements. These practices install a deep sense of environmental responsibility, ensuring that future generations continue to respect and protect the land. Teaching children to respect nature is emphasized to preserve the village’s environment.

Table 4. Contribution of banyan/peepal trees. Source; Chandraseekhar and Mahalaxmi (2023); Mitra et al. (2017).

Sl. No	Contribution		
1.	Oxygen production and air quality improvement	<ul style="list-style-type: none"> • These trees trap dust and particulate effectively through their dense and extensive canopy • They also absorb gaseous pollutants like ozone, nitrogen oxide etc. • They produce substantial oxygen 	0.07mg/cm ² ,
2.	Carbon sequestration	Absorbing carbon and storing in wood, roots, and soil.Store carbon	More than 100 kg of CO ₂ /year 18-19 tons of carbon/ average tree
3.	Soil erosion prevention	A extensive network of root systems hold soil extremely well thus prevent soil erosion.Preserve soil moisture, reduce run off.	-
4.	Habitat and biodiversity	Supply food for wild animals Birds, fruit bats, monkeys, squirrels Provide shelter for large number of animals	Study found it supports more than 10 bird species
5.	Climate regulation	Microclimate cooling-the expansive canopies provide huge shades and boost high rate of transpiration	Essentially mitigate heat in summer

Conclusion

In essence, the villages of Pernem Taluka embody a way of life where nature and spirituality are intertwined, fostering a sustainable, harmonious relationship with the environment. Our study found that most of the respondents acknowledge their contribution and want to spread the knowledge to the younger generation. The study underscores the intrinsic link between nature worship and environmental conservation, advocating for the integration of traditional knowledge into contemporary ecological strategies. It highlights the potential of cultural practices to inspire environment conservation.

Therefore, the villagers have huge responsibility to protect and conserve the sacred groves and trees within their locality.

Conflict of Interest

There is no conflict of the interest for this manuscript.

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