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HUMAN-INDUCED IMPACT ON SACRED GROVES

OF KOLHAPUR DISTRICT, MAHARASHTRA

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Abstract:

Sacred groves are community protected forest patches dedicated to deities and ancestors, remaining undisturbed and serving as vital biodiversity reservoirs. In the present study, field surveys were conducted in four sacred groves of Radhanagari Tehsil, Kolhapur District, Maharashtra during January–May 2024. The surveys revealed that, the sacred groves such as Khuloba, Wakighol, Bhaire and Ganganligeshwar were severely impacted by various human activities which damaging the ecological integrity of sacred groves. We noted serious human-induced disturbances like tree cutting, fuelwood collection, construction activity (road, renovation of temple), cattle grazing, agriculture encroachment, tourism and celebration of social and religious events. These illegal and unregulated human activities in and around sacred groves landscapes have resulted in significant loss of biodiversity, progressive shrinking of grove size moreover the weakening of their socio-rituals and cultural values. Moreover, these activities also affect the fauna of sacred groves by causing overexploitation of natural resources and loss in available foraging and nesting sites. From the present study, we concluded that, due to their high ecological and social significance, sacred groves require urgent protection from illegal and unregulated human interventions. Furthermore, the immediate implementation of effective management and conservation strategies is essential to safeguard these natural heritage sites.

Keywords: Human Activities and its impact, Sacred Groves, Radhanagari Tehsil, Kolhapur

Introduction

Sacred groves are the undisrupted and virgin forest landscapes located the outskirts of villages, such forest patches are dedicated on the name of deities and ancestral spirits by local communities (1). These forest landscapes are highly diversified for native flora and fauna and helps in maintaining the ecosystem balance. Sacred groves serve as natural place for rare, endemic and threatened species, playing important role in biodiversity conservation. However, in recent past, human involvement in natural landscapes has created unwanted pressure on natural habitat and its associated living organisms. Moreover, the modernization and developmental activities in and around the sacred groves leads in weakening of traditional beliefs and cultural practices. These human activities also affect the ecological services of sacred groves, thereby imbalancing the overall health of ecosystem. This paper aims to explore the threatening human activities in and around of sacred groves and their negative impact on sacred groves and the associated organisms of Kolhapur district, Maharashtra.

Materials and Methods

The present study was undertaken to assess the ecological health status of sacred groves and the extent of human impacts on them in Kolhapur District, Maharashtra. Several field visits were conducted to the selected sacred groves such Khuloba, Wakighol, Bhaire and Ganganligeshwar of Radhanagari Tehsil (Fig.1). Sacred groves were randomly selected from all peripheral regions of Radhanagari Tehsil based on gradients of human pressure and their ecological as well as socio-cultural significance (Fig.2). Primary data were collected during January–May 2024 through direct field observations, structured questionnaires and personal interviews with local residents and temple authority of sacred groves. The health status of sacred groves and anthropogenic activities occurring in and around of sacred groves were reported using visual encounter method. Anthropogenic activities with varying extent and intensity damaging the ecological integrity of sacred groves were systematically reported. The collected data were analyzed to assess the relationship between human activities and their impacts on sacred groves, particularly in terms of habitat degradation and loss of biodiversity.

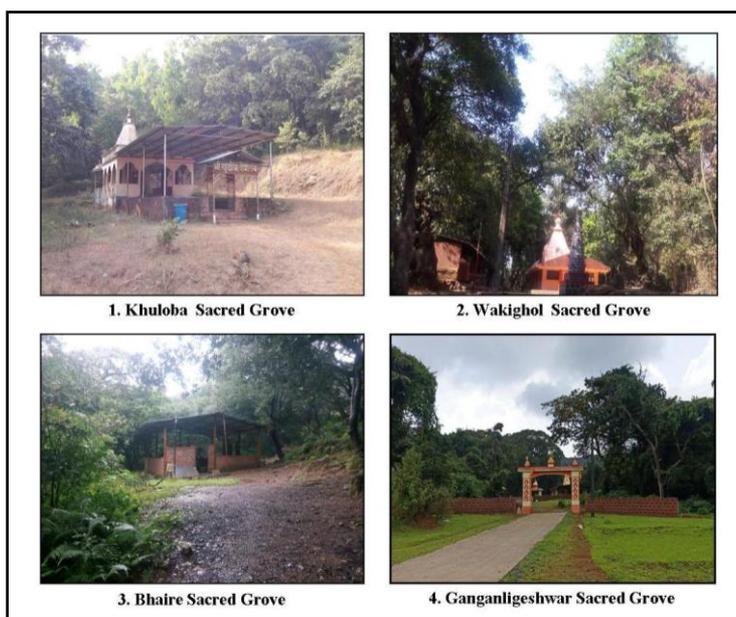


Figure 1: Study area (sacred groves) of Radhanagari Tehsil, Kolhapur

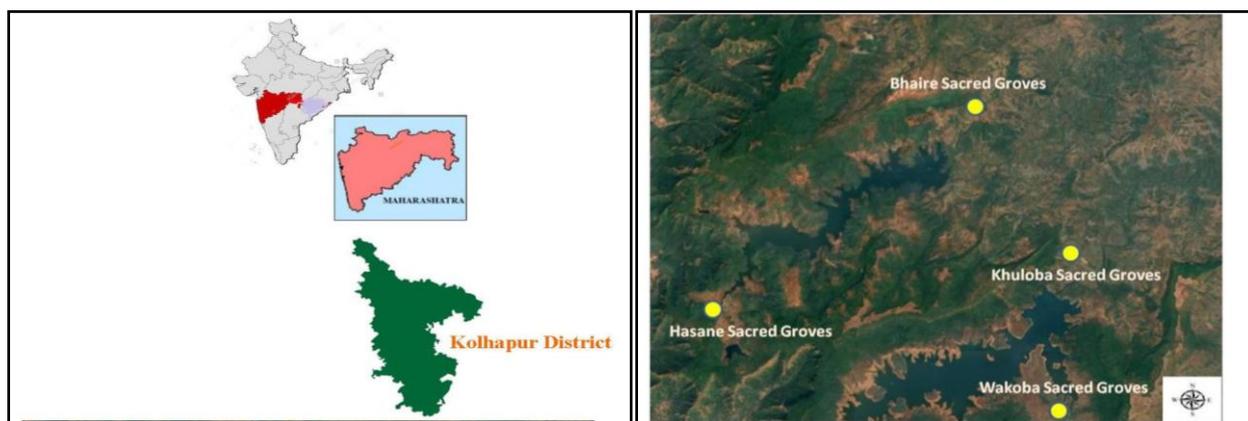


Figure 2: Satellite Map Showing sacred groves of Radhanagari Tehsil, Kolhapur

Results and Discussion

Sacred groves are the natural landscapes protected by the ethnic community on the base of religious and spiritual beliefs. These landscape acts as reservoir for most of indigenous and endemic species. Present study area is widely known for ecological significance and traditional beliefs. On the other hand, the increase human involvement in sacred groves leads in deteriorating the both ecological and cultural beliefs. We have reported harmful impact of human activity on the sacred groves of Radhanagari Tehsil, Kolhapur District. The selected four sacred groves like Khuloba, Wakighol, Bhaire and Ganganligeshwar were reported irregular human activities which all were gradually responsible for declining importance and values of sacred groves (Table 1).

Table 1: Selected sacred groves of Radhanagari Tehsil, Kolhapur

Sr. No.	Name of Sacred Groves	Name of deity	Name of Village	Latitude and Longitude	Size of Grove (Hector)
1	Khuloba	Khuloba	Bhujavade	16°24'06"N 74°01'19"E	0.422
2	Wakighol	Wakeshwar	Wakighol	16°17'19"N 74°00'35"E	1.092
3	Bhaire	Bharoba	Durgmanwad	16°27'12"N 73°58'00"E	0.870
4	Hasane	Gangolingeswar	Hasane	16°20'45"N 73°51'23"E	2.100

In present investigation, we have reported some critical human activities in and around were summaries as follow,

- 1. Tree cutting and fuel wood collection:** In study area, the old-aged trees and medicinally important plant species were collected by local communities for hut or cottage construction and conventional medicinal use. In addition, the dry branches and fallen wood were collected extensively for fuel purposes (Fig. 3. A). Tree cutting gradually responsible for declining the biomass and alter vegetation structure of sacred groves. Literature stated the cutting tress and harvesting fuel wood from the sacred groves may leads in the loss of biomass carbon loss (2). Sacred groves have been degraded by local communities due to the collection of plant resources and the harvesting of wood for fuel and fodder (3).
- 2. Construction activity (road, renovation of temple):** In present scenario, the major threats to the sacred groves are modernization and illegal development. In the study area, construction activities such as road

development and renovation or expansion of old age temples into new temple which led to habitat disturbance and fragmentation (Fig. 3. B). These activities responsible for declining the existence vegetation, soil erosion and increased human intrusion, overall these activities adversely impacts on endemic flora and fauna of sacred groves. The construction of concrete structures within sacred groves leads to soil compaction, soil porosity and water infiltration. This results in the loss of microhabitats and ecological niches essential for vegetation and small fauna. According to researchers, land mafias and construction of new building structures resulting in the loss of ecological and cultural values of sacred groves (4). According to report, the renovation of temple of sacred groves leads in damaging the sacred ecosystem (5).

3. **Cattle grazing:** All four sacred groves were reported cattle grazing activity which produce enormous pressure on native vegetation through trampling and overgrazing (Fig. 3. C). Uncontrolled cattle grazing leads in loss of sacred groves biodiversity and shrinking of habitats. Literature reported that, cutting trees and cattle grazing are major physical threats to the sacred groves (6). The native resources of sacred groves are exploited due to the cattle over grazing activity (7).
4. **Agricultural encroachment:** Landscapes of sacred groves are increasingly being used for the expansion of agricultural practices to meet livelihood (bread and butter) needs. Population growth exerts pressure on natural land-use systems, resulting in the conversion of forested areas into agricultural land to meet the rising demand for food and housing (8). Landscapes of sacred grove i.e. in and around are widely used by local communities for the cultivation of sugarcane, paddy, and *nachni* (Fig. 3. D). Such agricultural practices lead to habitat fragmentation, alteration of natural vegetation structure, and the loss of native plant species, thereby overall decline the ecological values of sacred groves. Major loss of forest landscape and biodiversity is dominated by agricultural practices (9,7).
5. **Pilgrimage and Tourism:** Most sacred groves of Radhanagari Tehsil are visited by a large number of tourists and pilgrims during festive events or *yatra* celebrations throughout the year. Due to high visitor pressure, the serenity and holiness of groves are badly impaired. The continuous influx of visitors results in the accumulation of substantial amounts of solid waste, particularly plastics litter and bottles in and around the sacred groves (Fig. 3. E). A sacred grove harbors a high number of endemic species and acts as nursery and breeding sites for wildlife. However, regular and uncontrolled human influx disturbs the animal behavior and circadian rhythms of wild fauna. These activities may have an overall impact on the occurrence and distribution of fauna within sacred groves and adversely affect their biodiversity. Large influx of tourist in the premises of sacred groves affect the peacefulness and responsible for pollution (10). Excessive ecotourism leads to negative impacts on ecological integrity and contributes to the loss of biodiversity (11).
6. **Celebration of social and religious events:** Sacred groves are spiritually and culturally protected by local communities, communities believe that deities reside within the sacred groves. Owing to these beliefs, communities gather on a large scale to conduct religious and spiritual events in sacred groves. We have reported seasonal celebration events, festivals, rituals which attract large gathering of pilgrims from nearby villages in the sacred groves (Fig. 3. F). Increased human influx exert significant pressure on the groves and adversely affects sacred ecosystem. In addition, ritual related activities contribute in

accumulation of waste materials and pollution within sacred groves.

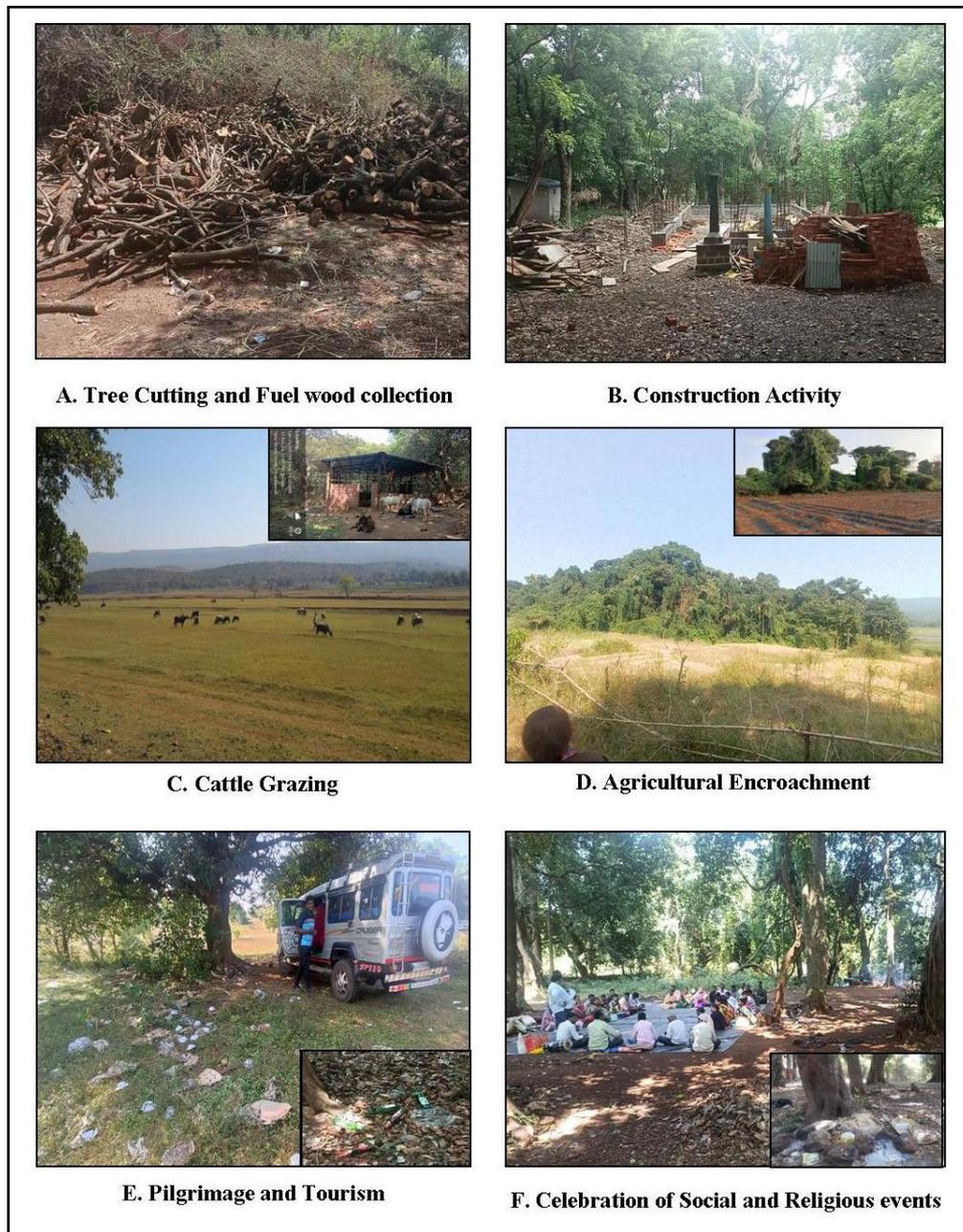


Figure 3: Human activities reported in and around the sacred groves of Radhanagari Tehsil, Kolhapur

Conclusion

The present study documented the various human activities in and around the four sacred groves of Radhanagari Tehsil, Kolhapur District. Predominant activities such as tree cutting, fuelwood collection, construction activities, cattle grazing, agricultural encroachment, tourism, and the celebration of social and religious events, all of which were observed at significant levels in the study area. Collectively, these activities are largely responsible for the deterioration of the ecological and aesthetic values of sacred groves. Therefore, these threatening activities need to be regulated, and effective conservation and management strategies must be implemented to ensure the long-

term sustainability of sacred groves. Furthermore, the strong maintenance of traditional beliefs and cultural values is essential for reinforcing community-based protection and conservation of sacred groves.

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Conflict of Interest

The authors declare no conflict of interest

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References

1. Ahmed, M., & Dhiman, M. (2024). Nucleus model of sacred groves (sacred groves: The nuclei of biodiversity cells): Traditional beliefs, myths, associated anthropogenic threats and possible measures of conservation in westernmost regions of Lesser Himalayas, India. *Ecological Frontiers*, 44(2).
2. Duncanson, L., Liang, M., Leitold, V., Armston, J., Krishna Moorthy, S. M., Dubayah, R., Costedoat, S., Enquist, B. J., Fatoyinbo, L., & Zvoleff, A. (2023). The effectiveness of global protected areas for climate change mitigation. *Nature Communications*, 14, 2908.
3. Chandran, M. D. S., Gadgil, M., & Hughes, J. D. (1998). Sacred groves of the Western Ghats of India. In P. S. Ramakrishnan, K. G. Saxena, & U. M. Chandrashekar (Eds.).
4. Kandari, L. S., Bisht, V. K., Bhardwaj, M., & Thakur, A. K. (2014). Conservation and management of sacred groves, myths and beliefs of tribal communities: A case study from North India. *Environmental Systems Research*, 1–10.
5. Blicharska, M., Mikusinski, G., Godbole, A., & Sarnaik, J. (2013). Safeguarding biodiversity and ecosystem services of sacred groves: Experiences from northern Western Ghats. *International Journal of Biodiversity Science, Ecosystem Services & Management*, 9(4), 339–346.
6. Daye, D. D., & Healey, J. R. (2015). Impacts of land-use change on sacred forests at the landscape scale. *Global Ecology and Conservation*, 3, 349–358.
7. Priya, K., & Sharma, S. (2014). Deteriorating condition of sacred groves in Jammu city and its surroundings, J&K. *International Journal of Scientific Research*, 3(4), 213–215.
8. Kabba, V., & Li, J. F. (2011). Analysis of land use and land cover changes, and their ecological implications in Wuhan, China. *Journal of Geography and Geology*, 3, 103–118.
9. Tamalene, M. M., Al, M. H. I., Muhdhar, Suarsini, E., & Rochman, F. (2014). The practice of local wisdom of Tobelo Dalma (Togutil) tribal community in forest conservation in Halmahera, Indonesia. *International Journal of Plant Research*, 4(4A), 1–7.
10. Francesca, N. (2017). The role of cultural heritage in sustainable development: Multidimensional indicators as decision-making tool. *Sustainability*, 9, 1882.
11. Patel, H. M., & Adhvaryu, M. (2022). Ecotourism can promote sustainable development in sacred grove of Parnera Hills. *Ecology, Environment & Conservation*, 28, S362–S369.