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Ecosystem Services and Ethnic Identities: The Economic Valuation of Sacred Groves of Kerala

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Abstract: This paper critically examines the economic valuation of sacred groves (*Kavus*) in Kerala, interrogating how efforts to assign monetary value to the ecosystem services intersect with complex ethnic identities and cultural politics. Sacred groves represent remnants of once-extensive evergreen forests, functioning as self-sustaining ecosystems that harbour endemic, endangered and economically significant plant species while providing crucial regulating services including microclimate stabilization, water harvesting and nutrient cycling. Kerala retains approximately 1,500 sacred groves with distribution concentrated in the northern Malabar region. These groves yield provisioning services including medicinal plants, non-timber forest products and ecosystem services. However, economic valuation frameworks encounter fundamental challenges when applied to spaces where cultural and spiritual values resist commodification. The groves embody "indigenous reverential ecofear" - a complex fusion of reverence and fear towards nature that has historically ensured conservation through taboo enforcement. The transformation of groves from relatively open commons to exclusive "club goods" reflects broader shifts in access regimes that economic valuation alone cannot capture. Furthermore, the decline of joint family systems and land fragmentation, driven by changing socio-economic scenarios, threatens grove viability in ways that challenge purely monetary approaches. It concludes that meaningful preservation requires integrating economic incentives with recognition of the groves contested social histories, ensuring that valuation does not inadvertently reinforce exclusionary dynamics or erase the diverse ethnic identities historically intertwined with these sacred landscapes.
Keywords: Sacred Groves, Economic Valuation, Political Ecology, Ecosystem Services.

INTRODUCTION

Sacred groves, known locally as ‘kavus’ in Kerala, represent one of the most enduring traditions of community-based conservation in the Indian subcontinent. Sacred groves are small forest patches dedicated to deities and ancestral spirits, embedded in the rural and peri-urban landscape of Kerala (Malhotra *et al.,* 2001; Murugan *et al.,* 2008). The groves function simultaneously as micro-ecosystems, ritual spaces and markers of caste, clan and regional identities for diverse communities. The groves harbour remarkable biological wealth, including numerous endemics and threatened taxa, alongside providing critical ecosystem services such as groundwater recharge, microclimate regulation and soil conservation (Khan *et al.,* 2008). In India, sacred groves are named differently like "Dev" in Madhya Pradesh, "Deorais or Deovani," in Maharashtra, "Sarnas" in Bihar, "Oran" in Rajasthan, “Devara Kadu” in Karnataka, “Kovil Kadu” “Kovikaadugal” in Tamil Nadu and “sarppakkavu” or “kaavu” in Kerala. As groves transition from family-owned commons to temple-managed properties or state-protected reserves, the question of who benefits from their economic valuation becomes inescapably political. Thus, this paper critically examines the economic valuation of sacred groves in Kerala, interrogating how efforts to assign monetary value to the ecosystem services intersect with complex ethnic identities and cultural politics

Kerala’s sacred groves in context

In Kerala, sacred groves range from a few trees in homesteads to larger tracts exceeding 20 hectares, often associated with ponds or streams and embedded within paddy fields, homestead gardens and temple complexes. Roughly these groves cover roughly 500 hectares and may number in the range of several thousands across the state, although estimates vary and many sites remain unmapped (Rajendraprasad, 1995; Pushpangadan *et al.,* 1998). Depending on the god being worshipped at various sacred groves, the grove is known by a variety of names which include "Ayyappan Kavu," in which the deity is Lord Ayyappan; "Bhagavathy Kavu," in which the deity is the goddess Bhagavathy; "Muthappan Kavu," in which the deity is Lord Shiva's incarnation Muthappan and "Sarpa Kavu," "Naga Kavu," or "Nagam," in which the deity is a serpent. Additionally, there are sacred groves known as "Yakshi Kavu" that are devoted to spirits, demons or ancestors (Malhotra *et al*., 2001). Historically, sacred groves were integral to the *tharavadu* system (joint family ancestral home), where joint families-maintained forest patches as the abode of family deities, serpent spirits and guardian gods, enforcing strict taboos on

cutting trees or hunting wildlife within their boundaries (Prasad and Mohanan, 1995; Chandrasekara and Sankar, 1998). With the breakdown of joint families into nuclear households, land partitioning has fragmented or destroyed numerous groves, weakening the customary institutions that linked ethnic identity, lineage and land stewardship.

Sacred groves are fundamental to Kerala's religious traditions, where the grove is the abode of deities and spirits and the prohibition on cutting trees or harming animals functions as an informal conservation rule. In ecological terms, these groves are cross-sections of evergreen forest embedded in a matrix of homesteads, paddy fields and plantations, harbouring numerous medicinal plants, rare herbs, butterflies and small vertebrates. Locationally, sacred groves occur from the coastal belt through the midlands up to the lower slopes of the Western Ghats, varying in size from a cluster of trees in a homestead compound to several hectares with ponds, streams and dense understorey. Many groves are closely associated with paddy landscapes and laterite hillocks, forming an important unit in the rural mosaic and often linked in ritual networks where a primary kavu has subsidiary groves in neighbouring villages.

Culturally, groves are associated with a wide range of deities, local guardian spirits and occasionally male warrior deities reflecting the layered religious history of Kerala. Groves frequently serve as venues for annual festivals, offerings and possession rituals and remain central to the religious and socio-cultural life of local people, especially in villages where temple-centred urbanisation has not fully displaced older practices. In addition, the groves offer a strong network of social system centred around sacred groves built with faith on God, customs, harmony and flow of income underlining that groves are nodal points for social cohesion, local charity and small-scale ritual economies.

Ethnic identities and ritual geographies

Sacred groves in Kerala are not generic religious spaces; they are deeply inscribed with the ethnic and caste identities of their custodians and devotee communities. For instance, many groves in central and northern Kerala are associated with 'Theyyam' (often called "The Dance of Gods") and other ritual performance traditions in which particular caste groups embody deity personas and re-enact origin myths tied to specific groves. In parts of Kannur and Kasaragod, other communities also participate in managing some groves, especially where Theyyam is performed, illustrating cross-religious entanglements of sacred ecology and local identity. Typologies of groves such as Kalikāvu (goddess groves) and Sarpakkāvu (serpent groves) reflect distinct ritual regimes, with further sub-types of Kalikāvu recognized on the basis of performance genres like Mudiyettu, Thira and Padayani, each associated with particular caste specialists and narrative traditions. These ritual and ethnic differentiations have implications for access rights, decision-making power and willingness to participate in conservation or payment schemes, making ethnic identity a central variable in any economic valuation exercise.

It should be noted that the serpent worship central to many groves is often associated with upper-caste member families who historically controlled land ownership and lower communities maintained parallel ritual relationships with these spaces through ancestor veneration and distinct ceremonial calendars. The physical geography of the groves themselves encodes these social distinctions, with inner sanctums traditionally restricted to particular castes while peripheral spaces accommodated more inclusive worship. Contemporary transformations are fundamentally altering these ritual geographies and such changes often privilege upper class while marginalizing the embodied, place-specific practices of landless communities whose ancestors cultivated different relationships with the groves' presiding deities. Thus, sacred groves offer ethnic identities within these living landscapes of memory and power.

Ecosystem services: A conceptual framing

The ecosystem services provided by sacred groves can be organized into supporting, provisioning, regulating and cultural services. Supporting services include soil formation, nutrient cycling and habitat provision for diverse flora and fauna; provisioning services involve non-timber forest products, medicinal plants and water for domestic use; regulating services cover microclimate regulation, groundwater recharge and carbon sequestration; and cultural services encompass spiritual values, ethnic identity, ritual performance, education and recreation. The sacred groves are self-sustaining systems that provide a wide array of critical ecosystem services, functioning as the last remaining refugia of once-extensive evergreen forests. The groves serve as vital repositories of medicinal flora, underscoring their irreplaceable conservation value. The famous combination of Nalppamaram (four keystone Ficus trees - Athi (*Ficus racemosa*), Ithii (*Ficus tsjahela*), Peral (*Ficus benghalensis*) and Arayal (*Ficus religiosa*) provides niche habitats for diverse bird and animal communities (Saraswati, 1998; Nair, 2013).

Beyond provisioning services, sacred groves deliver essential regulating services. They function as closed systems for nutrient and water cycling, with their

dense vegetation and humus-laden soil facilitating groundwater recharge, water filtration, and soil conservation. Perennial water bodies associated with groves historically served as village water sources and the filtered water is traditionally believed to possess healing properties. The grove ecosystems also contribute significantly to microclimate stabilization and carbon sequestration (Ray *et al.,* 2014). By preserving indigenous species and maintaining ecological processes, Kerala's sacred groves thus represent multifunctional landscapes delivering provisioning, regulating, and supporting services essential for both human well-being and biodiversity conservation.

Sacred groves as commons and "cultural commons"

The sacred groves in Kerala are common-pool resources that share many characteristics of ecological commons - non-excludable but rivalrous resource systems whose sustainability depends on collective action. However, the institutional reality is more complex: groves may be managed by private families, temple trusts, community bodies or Devaswom boards and in recent decades many sites have shifted from relatively open access to more closed, club-like regimes with concrete boundaries and commercialized temple complexes (Chandran and Hughes, 1997; Rutte, 2011). This transformation has implications for both ecosystem functioning and ethnic politics, as formerly plural spaces become controlled by narrower caste or religious elites, sometimes excluding lower groups with historical ritual roles. The idea of sacred groves as "cultural commons" highlights that what is at stake is not only access to biophysical resources but shared symbolic capital which complicates standard economic approaches to valuation and governance.

As common-pool resources, sacred groves exhibit the classical characteristics of subtractability, where one person's use potentially diminishes availability for others and challenges of excludability, requiring institutional mechanisms to regulate access. Historically, Kerala's groves functioned as community-managed resources governed by customary rules, taboos and ritual sanctions that controlled resource extraction and preserved ecological integrity. The concept of "cultural commons" extends this by recognizing that sacred groves embody not merely material resources but shared cultural meanings, ritual practices and collective identities passed across generations. These intangible dimensions of stories, beliefs and performative traditions associated with groves constitute common heritage that cannot be reduced to economic valuation. Thus, groves function simultaneously as ecological commons, ritual commons and contested cultural terrain where inclusion and exclusion are continuously negotiated.

Sacred groves and economics

Sacred groves are simultaneously ecological refugia and sites of ritual economy and their economic significance emerges from this tight coupling of nature, religion and rural livelihoods. Ramachandran (1999) described groves as relics of evergreen forest embedded within the agrarian landscape that regulate local water supply, maintain ecological equilibrium and provide raw materials for artistic and industrial uses, all of which have direct or indirect economic implications for surrounding communities. The structure and management of sacred groves showed that they are well-conserved sites are comparable to regional evergreen forests in biomass and species richness, underlining the magnitude of ecosystem services that would otherwise require substantial public investment to replace. In economic terms, these services include soil conservation, hydrological regulation and micro-climate moderation, which sustain paddy fields, homestead gardens and tree crops in adjoining lands.

The groves functioned as an informal environmental insurance mechanism, absorbing climatic shocks and buffering production risks for agrarian households. Lion-part of sacred groves contain ponds and wells that recharge groundwater and support domestic and agricultural water needs, benefits that would be costly to replicate through borewells or piped water schemes. From an ecological-economic perspective, these regulating and supporting services constitute a substantial but largely unpriced contribution to local and regional economies, even though they do not appear in conventional market transactions (Chandrasekara and Sankar, 1998). At the same time, sacred groves have long been woven into the ritual and festival economy of Kerala's villages, creating distinctive income flows and employment opportunities. The groves anchor annual festivals, offerings and associated cultural programmes, generating demand for priests, musicians, artisans, caterers and temporary vendors.

The way forward

The way forward for Kerala's sacred groves lies in a multi-pronged strategy that integrates ecological restoration, community empowerment, policy innovation and economic incentives while honouring their deep ethnic and ritual significance. Local custodians, ritual specialists and youth groups must be trained in simple biodiversity protocols like tree inventories, phenology records and water quality tests turning groves into living laboratories for citizen science and linking them to school curricula on ecology and heritage. Restoration efforts should prioritise sites with high ecological and cultural value, employing native species propagation from grove-sourced germplasm and traditional knowledge of medicinal

plants and pollinator habitats. Policy reforms should formalise customary rights while strengthening legal protections. Economic incentives must go beyond cash payments to reinforce stewardship without commodifying sacredness. A "Sacred Grove Conservation Fund" could channel annual grants to registered sites for festival support, ritual infrastructure and ecological upkeep, with allocations based on grove size, biodiversity scores and community participation. Finally, capacity-building and awareness are essential. Workshops on ethnobotany, sustainable NTFP harvesting and climate-smart rituals can empower younger generations, while media campaigns and documentaries highlight grove stories to build public support. By weaving sacred groves into Kerala's green economy this way forward safeguards biodiversity hotspots, sustains ethnic identities and positions groves as models of harmonious human-nature relations for the 21st century.

Conclusion

The preceding analysis has traversed the complex terrain where ecological science, economic valuation and cultural politics converge upon Kerala's sacred groves, revealing that these landscapes cannot be adequately understood through any single disciplinary lens. The study has demonstrated that while economic valuation of ecosystem services offers important tools for communicating the material significance of groves, such frameworks remain profoundly incomplete when they fail to reckon with the groves' embeddedness in specific ethnic histories and contested social geographies. The dramatic decline of sacred groves in recent decades testifies to genuine ecological crisis, yet the response to this crisis has increasingly framed preservation within economic paradigms that risk commodifying the sacred and erasing marginalised voices. The valuation of provisioning services captures only partial truths about landscapes that have functioned for centuries as ritual arenas, ancestral territories and sites of community identity formation. The sacred groves function simultaneously as ecological commons and cultural commons, yet the politics of commoning reveals persistent asymmetries in who benefits from preservation and whose histories are legitimated. The transformation of groves from family-owned spaces to temple-managed properties, accompanied by intensified ritualization and physical boundary construction, exemplifies how economic and institutional changes can reinforce exclusion even as they claim to preserve. The way forward requires integrating economic valuation with critical attention to ethnic identities and ritual geographies. Conservation policy must attend to the social histories embedded in grove landscapes, ensuring that preservation does not become another chapter in the long history of marginalisation. This means creating institutional spaces where diverse communities can negotiate competing claims to grove resources and meanings. It means recognising that sacred groves are not pristine ecosystems awaiting scientific management but living landscapes where memory, power and identity continuously intersect. Ultimately, the preservation of Kerala's sacred groves demands not merely economic valuation but political reckoning - an honest confrontation with the caste hierarchies, access regimes, and cultural politics that have always shaped these forest fragments. Only by holding ecological and social justice together can Kerala sustain these landscapes that are as rich in meaning as they are in biodiversity.

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