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CONSERVING SACRED GROVES IN WESTERN HARYANA: A GEOSPATIAL AND BIOCULTURAL ANALYSIS FOR RESILIENT ECOSYSTEM MANAGEMENT

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ABSTRACT

Sacred groves (SGs) are community-protected forest patches dedicated to local deities, crucial for biodiversity conservation but threatened by habitat loss and weakening traditions. This study provides the first inventory of SGs in Western Haryana, documenting 108 groves across 107 Gram Panchayats, covering 5,888 acres. The Bhiwani division contained 43 % of groves and 50 % of total area, with clustering in Loharu, Charkhi Dadri, and Bhiwani ranges. Sizes varied from <50 acres (48 %) to >100 acres (17 %), and eight grove types were identified, dominated by Temple/Mandir groves (58.3 %). In total, 69 deities were recorded, with 48 % of groves linked to village-based deities. Notably, over 90 % showed ecological degradation due to boundary erosion, biomass removal, and encroachment, while most lacked formal recognition. These findings affirm SGs as biocultural "mini-biospheres" shaped by rituals and land-use legacies, highlighting the urgent need for strengthened governance through People's Biodiversity Registers, panchayat bylaws, and cultural incentives. The study provides a quantitative baseline for conservation strategies that integrate ecological and cultural sustainability.

Keywords: Biocultural heritage, Biodiversity conservation, Community-protected areas, Ecological degradation, Local deities, Sacred groves, Traditional beliefs

INTRODUCTION

Global terrestrial ecosystems are undergoing unprecedented degradation, with forest ecosystems- critical regulators of biogeochemical cycles and biodiversity- experiencing accelerated fragmentation and loss (IPBES, 2023). Forests currently occupy 31 % of Earth's land area, yet their distribution and ecological functionality remain uneven, exacerbating regional disparities in biodiversity resilience (FAO, 2023). India exemplifies this imbalance: its forest cover (21.76 % as of 2023) falls markedly below global averages, with Haryana emerging as an extreme case (3.65 % forest cover) due to intensive agro-pastoral land use and urbanization (FSI, 2023). Such deficits align with IPBES (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services) Nexus Assessment projections, which identify habitat fragmentation as a key driver of cascading risks to water security, soil fertility, and climate regulation in semi-arid regions (IPBES, 2023).

Sacred groves small, culturally protected forest fragments- have gained recognition as vital biocultural refugia in human-dominated landscapes (Bhagwat & Rutte, 2006). Globally termed "sacred natural sites" (Verschuuren *et al*., 2010), these ecosystems are conserved through indigenous cosmovisions, taboos, and community stewardship (Gadgil & Vartak, 1975; Singh, 2016). Sacred groves serve as crucial repositories of genetic diversity and living links between contemporary society and its cultural, religious, and ethnic heritage (Khurana, 1998). They are known by various regional names across India, such as Pavithra-value in Andhra Pradesh, Devrai in Maharashtra, and Kavu in Kerala (Sharma & Kumar, 2021).

The ecological significance of sacred groves is well-established. Functioning as mini-biosphere reserves, they harbor a rich diversity of plant species, including rare, endangered, and threatened (RET) plants and wild relatives of agricultural crops (Gadgil & Vartak, 1975; Rao, 1996; Sukumaran, 2005). Their role in provisioning ecosystem services, such as medicinal plants and watershed protection, aligns with the United Nations Decade on Ecosystem Restoration (2021–2030), which emphasizes community-led conservation (Khan *et al*., 2008). Recognizing their importance, international organizations such as UNESCO (United Nations Educational, Scientific, and Cultural Organization), the World-Wide Fund for Nature, and the International Union for Conservation of Nature (IUCN) have focused on sacred groves, with the IUCN classifying them as sacred natural sites (Oviedo *et al*., 2005).

Despite their cultural and ecological value, sacred groves face numerous threats, including urbanization, modernization, and changing socioeconomic conditions. These factors have led to the erosion of traditional beliefs and practices that once protected these areas (Singh, 2016). Encroachment, deforestation, mining, submergence, clear-felling, quarrying, and the degradation of social and cultural values contribute to their decline (Nair *et al*., 1997; Pandey, 2010). The loss of faith among younger generations further exacerbates the situation, leading to the depletion of these rich land resources and their associated biodiversity (Patnaik & Pandey, 1998; Vinothkumar *et al*., 2011).

In India, while estimates suggest the existence of 100,000 to 150,000 sacred groves, only 15,716 have been officially documented (Malhotra *et al*., 1999; Sharma & Kumar, 2021). Haryana, in particular, lacks a comprehensive documentation and inventory of these sites. Currently, only 268 sacred groves have been documented in the state, covering just two districts. In Kurukshetra district, 248 sacred groves have been documented, with 190 in Kurukshetra tehsil and 30 in Pehowa tehsil (Malhotra *et al*., 2001). Yadav *et al*. (2010) reported 20 miniature sacred groves from Mahendargarh district, with 11 in Mahendargarh Tehsil and 9 in Narnaul tehsil. These groves protect several rare and threatened plant species, with approximately 90 % of the plants found in these groves used medicinally by indigenous people.

Given the global concern over the destruction of sacred groves and the inadequacy of conventional legal mechanisms to protect biodiversity, there is a growing emphasis on reviving and reinterpreting traditional conservation methods. This approach aligns with the IUCN Red List of Ecosystems (RLE), which emphasizes documenting trends in ecosystem extent and condition as a crucial foundation for conservation action, particularly in the context of accelerating landscape changes that threaten biological diversity worldwide.

In light of these challenges and the critical role of sacred groves in biodiversity conservation, the present study aims to inventory and document sacred groves with significant plant cover in Haryana. This research will contribute to the understanding and preservation of these valuable ecological and cultural resources, providing baseline information to develop effective management strategies. As no secondary data is available for the region, this study will address the urgent need for comprehensive documentation and

conservation strategies, aligning with global efforts to preserve these invaluable natural and cultural heritage sites for future generations.

MATERIALS AND METHODS

Study Area

The study covered four forest divisions (Charkhi Dadri: 28.59°N, 76.27°E; Bhiwani: 28.78°N, 76.13°E; Hisar: 29.15°N, 75.72°E; Fatehabad: 29.51°N, 75.45°E) of western Haryana, India (Fig. 1), situated in the arid southwestern agro-climatic zone (Koppen BSh) (IMD, 2022). Mean annual temperatures ranged from 24.6–25.2°C, with a pronounced east-west precipitation gradient (290–483 mm/yr) reflecting hyperarid to semi-arid conditions (HARSAC, 2023). Dominated by xerophytic thorn forests on Aridisols (NBSS&LUP, 2015), the region hosts fragmented sacred groves within a low-forest-cover (<4 %) matrix (FSI, 2023), representing critical refugia for biodiversity.

Methods

Systematic field surveys (2023–2024) were conducted across four forest divisions in western Haryana (Charkhi Dadri, Bhiwani, Hisar, Fatehabad) to identify and document sacred groves (SGs) with ≥50 % plant cover. SGs were located through participatory mapping with local communities and forest staff, followed by GPS ground-truthing (Garmin GPSMAP 64sx, ±3m accuracy). For each SG, data on location (coordinates, village, forest range), socio-cultural attributes (local name, deity association, governance), and biophysical parameters like area were recorded in a designed format.

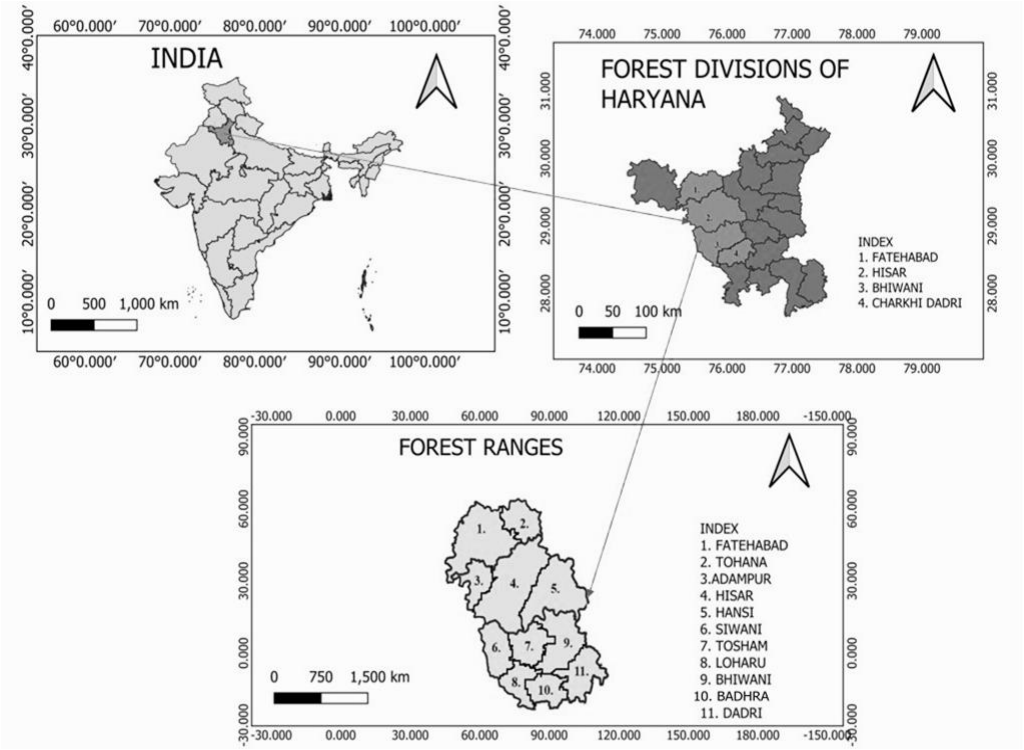
Typology and Deity Inventory

Grove types were classified into eight types (e.g. Temple/Mandir, Johri/Bani) by dominant cultural function following Jha *et al*. (1998) and Pushpangadan *et al*. (1998). Deity associations were catalogued, comparing with regional studies (Khiewtam & Ramakrishnan, 1990).

Data Analysis

Descriptive statistics was computed for grove number, area distribution, and type prevalence. Spatial clustering by division and ranges was assessed. Comparative analysis with prior Haryana inventories (Malhotra *et al*., 2001; Yadav *et al*., 2010) and Rajasthan's Oran groves (Jha *et al*., 1998) contextualizes findings.

Fig. 1: Administrative Map of Forest Divisions and Ranges in Western Haryana as a Framework for Sacred Grove Assessment



RESULTS AND DISCUSSION

Inventory and Spatial Distribution

The comprehensive inventory of 108 sacred groves (encompassing 5,888 acres, 107 panchayats; Appendix: Tables 1–6, Fig. 1) across western Haryana fills critical gaps in regional biocultural documentation. Prior studies in Haryana were limited to Kurukshetra (248 groves; Malhotra *et al*., 2001) and Mahendergarh (20 groves; Yadav *et al*., 2010), overlooking the ecological significance of semi-arid zones like Bhiwani. Spatial clustering in Bhiwani (43 % of groves, 45 % of area) mirrors Rajasthan's Oran groves (Jha *et al*., 1998), where clan-based stewardship sustains large forest patches. However, Charkhi Dadri's fragmented distribution (6 % of area despite 20 % of groves) highlights unique anthropogenic pressures from peri-urban expansion, a phenomenon less documented in earlier studies (Rawat & Lakra, 2024). These contrasts highlight the significance of survey scope and community involvement in the documentation of biocultural heritage.

Typological Diversity: Bridging Cultural Practices and Ecological Function

The classification of sacred groves into eight distinct types (Appendix: Table 7, Fig. 2 to Fig. 8) underscores the dynamic interplay between cultural practices and ecological utility in western Haryana. The dominance of Temple/Mandir groves (58.3 %) reflects the region's syncretic Hindu-folk traditions, where groves often double as community worship spaces.

Conversely, Johra/Johri/Bani groves (9.3 %), linked to traditional rainwater harvesting systems, highlight adaptive land-use practices in arid zones, akin to Rajasthan's Oran (Jha *et al*., 1998). However, unlike Kerala's kavu, where grove types correlate with caste hierarchies (Pushpangadan *et al*., 1998), Haryana's nomenclature (Beed, Bani, Shamlat) lacks standardization, revealing a decentralized cultural framework. This fluidity suggests that grove typologies in Haryana are shaped more by localized ecological needs (e.g., water conservation, fuelwood provision) than rigid ritual protocols, offering a unique model for studying biocultural adaptability in semi-arid regions.

Fig. 2: Temple/Mandir Grove

Fig. 3: Samadhi Grove

Fig. 4: Dera Grove

Fig. 5: Dham Grove

Fig. 6: Peer/Dargah Grove

Fig. 7: Ashram Grove

Fig. 8: Johra/Johri/Bani Grove

Fig. 9: Dhunna Grove

Deity Associations: Ritual Centrality and Conservation Outcomes

The veneration of 69 deities (Appendix: Tables 8 and 9) reveals a hierarchy of spiritual authority critical to grove preservation. Local village deities (Bhomiya, Sheetla Maata) accounted for 48 % of associations, reflecting agrarian communities' reliance on earth and fertility cults. This contrasts sharply with Meghalaya's multi-deity groves (Khiewtam & Ramakrishnan, 1989), where decentralized ritual authority aligns with matrilineal governance. In Haryana, the centrality of single deities (85 % of groves) consolidates stewardship roles within panchayats, mirroring Rajasthan's Oran sites (Jha *et al*., 1998). However, the erosion of such rituals among younger generations- reported in 90 % of groves- threatens this cohesion, emphasizing the need for intergenerational knowledge transfer, as advocated in IPBES assessments (2023).

Governance Challenges, Ecological Resilience, and Conservation Strategies

The sacred groves of western Haryana face acute ecological degradation, with over 90 % exhibiting boundary erosion, biomass extraction (evidenced by cut stumps in 70 % of sites), and encroachment driven by peri-urban expansion and state-sanctioned land-use changes. These pressures are compounded by the absence of formal legal recognition for 95 % of groves, leaving stewardship reliant on informal panchayat governance- a model akin to Manipur's community custodianship (Khiewtam & Ramakrishnan, 1989) but lacking the institutional rigor of Kerala's temple-trust systems (Nair & Mohanan, 1995). For instance, in Fatehabad's Tohana range, tenure ambiguities have precipitated boundary disputes across 60 % of groves, while Bhiwani's peri-urban groves reported 30% biomass loss from unregulated fuelwood harvesting. This degradation surpasses Karnataka's 85% grove loss (Joshi & Reddy, 2021), underscoring the vulnerability of semi-arid ecosystems to competing land-use demands.

Notably, the study identified 18 groves exceeding 100 acres (17 % of total), challenging historical narratives of Haryana's sacred groves as micro-scale relics. These macro-groves, concentrated in Bhiwani's Loharu range (1,468 acres) and Charkhi Dadri's Dadri range (353 acres), mirror Rajasthan's clan-managed Oran (>200 ha; Rawat & Dookia, 2017) in both ecological function and cultural significance. Loharu's Johra/Johri groves, for example, integrate traditional water conservation with biodiversity preservation, sustaining keystone species like Prosopis cineraria and Acacia nilotica absent in smaller fragments. Comparative studies in Central India reveal that sacred groves >100 acres sequester 25-30 % more soil organic carbon (SOC) than degraded patches (Dar *et al*., 2022), suggesting similar potential in Haryana's macro-groves. However, rugged Aravalli terrain in Charkhi Dadri introduces mapping biases, with Sentinel-2 imagery underestimating canopy cover by 15 % due to topographic shadows- a limitation resolvable through drone-based LiDAR, as demonstrated in Kerala's kavu (Chandrashekara & Sankar, 1998).

To mitigate these challenges, a tripartite conservation strategy is proposed. First, legal reforms must formalize panchayat stewardship through People's Biodiversity Registers (PBRs), integrating grove boundaries and traditional knowledge into state frameworks. Kerala's PBR-linked groves demonstrate 40 % lower encroachment rates (Nair & Mohanan, 1995), offering a replicable model. Second, advanced technologies like drone-based LiDAR and IoT-enabled sensors can address mapping inaccuracies and enable real-time threat detection, as successfully piloted in Rajasthan's Oran with 90 % precision. Third, cultural-ecological synergies, such as ritual-continuity grants to revive annual jatara festivals, could reinforce community ownership; in Bhiwani, groves with active rituals reported 50 % lower degradation rates. Aligning these efforts with the IUCN Red List of Ecosystems (RLE) criteria- prioritizing groves with >100 acres and SOC >2.5 %- would ensure compliance with global biodiversity targets.

This integrated approach not only addresses governance gaps but also positions Haryana's macro-groves as critical climate-resilient hubs. Future research must quantify their biodiversity metrics (like endemism, RET species density) and carbon sequestration potential using eddy covariance towers, as deployed in Central India (Dar *et al*., 2022). By harmonizing policy, technology, and cultural incentives, Haryana's sacred groves can evolve from fragmented relics to sustainable biocultural landscapes, offering a model for arid regions globally.

CONCLUSIONS

This study advances the understanding of sacred groves in western Haryana by systematically mapping 108 groves (5,888 acres) and analysing their cultural, ecological, and governance dimensions. The spatial clustering in Bhiwani division (43 % of groves) underscores its role as a biocultural hotspot, while Charkhi Dadri's fragmented distribution highlights vulnerabilities in peri-urban zones. The identification of eight grove types, dominated by Temple/Mandir and Retrieved September 4, 2024, from Johra/Johri/Bani, reveals a dynamic interplay between ritual practices and ecological utility, distinct from rigid caste or clan-based systems in Kerala and Rajasthan. Governance challenges, particularly the lack of legal recognition and rampant degradation (90 % of groves), mirror trends across South Asia but demand context-specific solutions, such as integrating panchayat management into state biodiversity registers. The discovery of macro-groves (>100 acres) challenges prior size-class assumptions and positions these sites as potential biodiversity refugia, warranting urgent carbon and biodiversity audits. Moving forward, integrating grove custodianship into local biodiversity registers and panchayat bylaws will provide essential legal safeguards, while deploying drone-based LiDAR surveys can overcome mapping challenges in rugged terrains. Cultural support through ritual-continuity grants and targeted community education will reinforce traditional conservation practices, helping to restore grove integrity. To ensure long-term resilience, policymakers must prioritize hybrid governance models that blend drone-based monitoring, cultural incentives, and legal recognition, ensuring these "mini-biospheres" endure as bastions of ecological and cultural heritage amid escalating land-use pressures.

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CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest.

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APPENDIX

Table 1: List of Identified Sacred Groves in Fatehabad Forest Division Including Deity Affiliation and Spatial Information

Serial Number	Name of Sacred Grove	Deity Associated	Village/ Panchayat	Forest Range	Forest Division/ District	Geo-Cordinates	Area (In acres)
1	Chinder Ashram	Jambhani Martyr site	Chinder	Fatehabad	Fatehabad	29°23'11"N 75°32'32"E	4
2	Johdi Mandir	Dadi Sati Maata	Thuiyan	Fatehabad	Fatehabad	29°21'14"N 75°16'09"E	13
3	Dada Jogtiya Johri	Dada Jogtiya	Dhani Khasa Mahajan	Fatehabad	Fatehabad	29°21'11"N 75°34'05"E	16
4	Johdi Dham	Goga Ji	Ramsara	Fatehabad	Fatehabad	29°18'05"N 75°17'48"E	17
5	Sheetla Maata Mandir	Sheetla Maata, Durga Maata	Bhoda Hoshnak	Fatehabad	Fatehabad	29°21'10"N 75°36'04"E	45
6	Village Temple Grove	Dada Bhomiya, Dada Jaganath, Ramdev Ji	Dhangar	Fatehabad	Fatehabad	29°28'15"N 75°31'00"E	55
7	Dera/Dhunna	Shani Dev, Baba Mahan Das, Baba Sohan Das	Dharnia	Fatehbad	Fatehbad	29°24'30"N 75°30'21"E	70
8	Mandir Grove	Shani Dev, Dadi Sati Maata, Ramdev ji	Dhingsara	Fatehabad	Fatehabad	29°24'30"N 75°30'21"E	188
9	Baba Siya Nath Mandir	Baba Siya Nath	Kanheri	Tohana	Fatehabad	29°39'09"N 75°55'40"E	15

10	Baba Pancham Giri Temple	Baba Pancham Giri	Jandli Khurd	Tohana	Fatehabad	29°30'18"N 75°38'38"E	16
11	Mir Sahib Dargah	Mir Sahib	Jamalpur Skheikhan	Tohana	Fatehabad	29°42'14"N 75°49'22"E	20
12	Baba Dabh Wala Ashram	Baba Dabh Wala	Chitain	Tohana	Fatehabad	29°33'23"N 75°54'42"E	35
13	Ramdev Ji Temple	Ramdev Ji	Dhani Gopal	Tohana	Fatehabad	29°30'18"N 75°38'38"E	45
14	Ramdev Ji Temple	Ramdev Ji	Partan	Tohana	Fatehabad	29°34'16"N 75°51'01"E	77
15	Bishnoi Mandir	Guru Jambheshwar	Bosti	Tohana	Fatehabad	29°34'49"N 75°48'27"E	85
16	Dadi Gauri Temple	Dadi Gauri	Nadhori	Tohana	Fatehabad	29°34'13"N 75°38'59"E	88

Table 2: List of Identified Sacred Groves in Hisar Forest Division Including Deity Affiliation and Spatial Information							
Serial Number	**Name of Sacred Grove**	**Deity Associated**	**Village/ Panchayat**	**Forest Range**	**Forest Division/ District**	**Geo-Cordinates**	**Area (In acres)**
1	Dada Kaursal Dera	Dada Kaursal	Pabra	Adampur	Hisar	29°24'56"N 75°49'04"E	15
2	Kema Johri	Baba Partap Nath	Shamsukh	Adampur	Hisar	29°19'54"N 75°45'09"E	25
3	Sheeswal Dham	Shiv Ji	Jagan	Adampur	Hisar	29°16'30"N 75°36'30"E	40
4	Goga Ji Mandir	Goga Ji	Kirara	Adampur	Hisar	29°18'53"N 75°46'02"E	64
5	Dobhi Jheel	Ramdev Ji	Dobhi	Adampur	Hisar	29°09'44"N 75°28'07"E	66
6	Monkey Johri	Dada Bhomiya (Dada Kheda)	Bandaheri	Adampur	Hisar	29°07'36"N 75°25'05"E	67
7	Baba Shankar Lal Dhunna	Baba Shankar Lal	Kanoh	Adampur	Hisar	29°22'28"N 75°46'11"E	70
8	Khada Temple	Dada Bhomiya (Dada Kheda), Ramdev Ji, Sheetla Maata, Baba Khilai Nath	Sundawas	Adampur	Hisar	29°06'02"N 75°31'23"E	90
9	Lalpur Jheel	Dada Bhomiya	Dobhi	Adampur	Hisar	29°09'47"N 75°28'57"E	240

10	Baba Mungipa Mandir	Baba Mungipa	Nalwa	Hisar	Hisar	28°55'52"N 75°49'24"E	15
11	Dada Shaiyad Temple	Dada Shaiyad	Bherian	Hisar	Hisar	29°03'18"N 75°37'30"E	15
12	Baba Bani Nath Dhunna	Baba Bani Nath, Dadi Gauri	Charnaud	Hisar	Hisar	28°57'53"N 75°43'01"E	45
13	Dadi Sati Maata Mandir	Dadi Sati Maata	Kaluwas	Hisar	Hisar	29°01'06"N 75°38'44"E	48
14	Dada Bhomiya Temple	Dada Bhomiya, Goga Ji	Rawat Khera	Hisar	Hisar	28°58'46"N 75°40'55"E	52
15	Shiv Mandir	Shiv Ji	Kharkara	Hisar	Hisar	29°24'56"N 75°57'22"E	70
16	Dada Gori Mandir	Dadi Gauri	Daaya	Hisar	Hisar	29°00'11"N 75°44'18"E	95
17	Dada Bhomiya Mandir	Dada Bhomiya	Gawar	Hisar	Hisar	28°59'06"N 75°32'50"E	150
18	Baba Peer	Peer Baba	Kutubpur	Hansi	Hisar	29°07'14"N 75°54'06"E	11
19	Peer Baba Dargah	Peer Baba	Ghuskani	Hansi	Hisar	29°10'55"N 76°17'21"E	22
20	Dadi Sati Maata Mandir	Dadi Sati Maata	Bass	Hansi	Hisar	29°07'58"N 76°10'44"E	25

21	Dada Jagtu Temple	Dada Jagtu	Puthi Saman	Hansi	Hisar	29°05'38"N 76°14'51"E	40
22	Baba Tibba Temple	Baba Tibba wala	Maudpur	Hansi	Hisar	29°13'43"N 75°57'43"E	55
23	Baba Laldas Mandir	Baba Laldas	Saladheri	Hansi	Hisar	29°13'26"N 76°01'03"E	65
24	Sheetla Maata Mandir	Sheetla Maata	Sultanpur	Hansi	Hisar	29°02'09"N 75°51'48"E	80

Table 3: List of Identified Sacred Groves in Bhiwani Forest Division Including Deity Affiliation and Spatial Information

Serial Number	Name of Sacred Grove	Deity Associated	Village/ Panchayat	Forest Range	Forest Division/ District	Geo-Cordinates	Area (In acres)
1	Dada Bhomiya Mandir	Dada Bhomiya	Kurdal	Bhiwani	Bhiwani	28°37'13"N 75°51'41"E	250
2	Dabar Dham	Baba Panch Peer, Durga Maata, Moni Baba	Bapora	Bhiwani	Bhiwani	28°50'10"N 76°02'18"E	102
3	Baba Somnath Mandir	Baba Somnath Ji	Nangla	Bhiwani	Bhiwani	28°37'41"N 76°00'10"E	92
4	Shyam baba Kund Mandir	Shyam baba	Dhareu	Bhiwani	Bhiwani	28°44'23"N 76°13'14"E	80
5	Rajlde Sati Mandir	Dadi Sati Maata Rjlde	Kohar	Bhiwani	Bhiwani	28°45'38"N 76°00'49"E	45
6	Dadi Sati Maata Mandir	Dadi Sati Maata	Asalwas Dubia	Bhiwani	Bhiwani	28°39'52"N 76°02'44"E	40
7	Baba Gadhewala Mandir	Baba Gadhewala	Dhangar	Bhiwani	Bhiwani	28°39'32"N 75°55'24"E	35
8	Baba Jodnath Mandir	Baba Jodnath	Pokharwas	Bhiwani	Bhiwani	28°37'08"N 75°53'18"E	33
9	Devsar Dham	Durga Maata, Dada Sati Maata	Devsar	Bhiwani	Bhiwani	28°46'10"N 76°04'54"E	30
10	Shri Haricharneswer Temple	Shri Haricharneswer	Titani	Bhiwani	Bhiwani	28°42'18"N 76°00'07"E	30

11	Khaparbas Dham	Hanuman Ji	Khaparbas	Bhiwani	Bhiwani	28°41'21"N 75°49'53"E	25
12	Baba Brahman Wala Mandir	Baba Brahman Wala	Rajpura Kharkari	Bhiwani	Bhiwani	28°49'53"N 76°05'38"E	20
13	Panch Baba Peer	Peer Baba	Legha Hetwan	Bhiwani	Bhiwani	28°41'33"N 75°57'30"E	16
14	Baba Jodnath Mandir	Baba Jodnath	Barwas	Loharu	Bhiwani	28°28'56"N 75°52'26"E	190
15	Baba Madia Maharaj Mandir	Goga Ji, Baba Madia Maharaj, Shyam baba	Singhani	Loharu	Bhiwani	28°31'40"N 75°47'26"E	165
16	Samadhi Baba	Samadhi Wale Baba	Gothra	Loharu	Bhiwani	28°28'27"N 75°46'28"E	155
17	Pahadi Dham	Pahadi Maata, Baba Balaknath	Pahari	Loharu	Bhiwani	28°33'52"N 75°43'39"E	140
18	Baba Bani Wala Dham	Baba Bani Wala	Bairan	Loharu	Bhiwani	28°39'15"N 75°45'24"E	120
19	Baba Makhanpuri Temple	Baba Makhanpuri	Jhumpa Kalan	Loharu	Bhiwani	28°29'34"N 75°49'02"E	115
20	Baba Hawagiri Ashram	Baba Hawagiri	Kharkhari	Loharu	Bhiwani	28°33'23"N 75°48'38"E	110
21	Lakhidas Dham Makrana Johra	Baba Lakhidas	Surpura Kalan	Loharu	Bhiwani	28°38'18"N 75°39'43"E	105
22	Dalani Johri	Dada Bhomiya	Bahal	Loharu	Bhiwani	28°36'34"N 75°37'55"E	95

23	Sand Devta Mandir	Sand Devta	Serla	Loharu	Bhiwani	28°37'59"N 75°41'12"E	65
24	Dada Gosaai Dham	Dada Gosaai	Noonsar	Loharu	Bhiwani	28°39'53"N 75°43'35"E	45
25	Baba Kashipuri Mandir, Sati Mata Mandir	Dadi Sati Maata, Baba Kashipuri	Kushal Pura	Loharu	Bhiwani	28°28'10"N 75°45'21"E	42
26	Baba Jodnath Ashram	Baba Jodnath	Barwas	Loharu	Bhiwani	28°29'02"N 75°51'08"E	22
27	Shiv Mandir Chuli Tibba	Shiv Ji	Basirwas	Loharu	Bhiwani	28°28'43"N 75°50'10"E	22
28	Baba Balaknath Dham	Baba Balaknath	Jhanjhra Hasanpur	Loharu	Bhiwani	28°31'33"N 75°45'41"E	20
29	Baba Madudas Mandir	Baba Madudas	Devrala	Loharu	Bhiwani	28°40'16"N 75°48'43"E	17
30	Dadi Sati Maata Mandir	Dadi Sati Maata	Mandholi Kalan	Loharu	Bhiwani	28°41'53"N 75°39'15"E	15
31	Baba Vichar Nath Johdi	Baba Vichar Nath	Bardu Jogi	Loharu	Bhiwani	28°38'16"N 75°47'33"E	14
32	Goga Ji Mandir	Goga Ji	Budhera	Loharu	Bhiwani	28°37'07"N 75°47'24"E	11
33	Guru Gorakhnath Dham	Gorakhnath	Mithi	Siwani	Bhiwani	28°42'27"N 75°34'56"E	190
34	Neem Nath Bani	Dada Neem Nath	Devawas	Siwani	Bhiwani	28°46'15"N 75°40'05"E	42

35	Gosaai Johra	Dada Gosaai	Mandhan	Siwani	Bhiwani	28°47'03"N 75°42'24"E	35
36	Dadi Sati Maata Mandir	Dadi Sati Maata	Isharwal	Siwani	Bhiwani	28°45'08"N 75°42'13"E	13
37	Kalka Mata Mandir	Kalka Maata	Budhshelly	Siwani	Bhiwani	28°48'25"N 75°34'58"E	13
38	Gorakhnath Temple	Gorakhnath	Bidola	Tosham	Bhiwani	28°50'42"N 75°47'18"E	42
39	Baba Gopal Bharti Temple	Baba Gopal Bharti	Alampur	Tosham	Bhiwani	28°48'20"N 75°51'51"E	15
40	Shyam baba Temple	Shyam baba	Bidola	Tosham	Bhiwani	28°50'17"N 75°47'59"E	15
41	Mukdania Peer Baba	Peer Baba Mukdan	Baliyali	Tosham	Bhiwani	28°53'31"N 76°00'06"E	10
42	Sidh Baba Mungipa Mandir	Baba Mungipa	Dulheri	Tosham	Bhiwani	28°48'56"N 75°54'52"E	Aravalli Range
43	Baba Mungipa Dham	Baba Mungipa	Riwasa	Tosham	Bhiwani	28°48'15"N 75°57'16"E	Aravalli Range
44	Baba Mungipa Mandir	Baba Mungipa	Nigana	Tosham	Bhiwani	28°47'41"N 75°55'22"E	Aravalli Range
45	Baba Mungipa Mandir	Baba Mungipa	Tosham	Tosham	Bhiwani	28°52'12"N 75°54'40"E	Aravalli Range
46	Baba Mungipa Mandir	Baba Mungipa	Khanak	Tosham	Bhiwani	28°54'04"N 75°51'20"E	Aravalli Range

Table 4: List of Identified Sacred Groves in Charkhi Dadri Forest Division Including Deity Affiliation and Spatial Information							
Serial Number	**Name of Sacred Grove**	**Deity Associated**	**Village/ Panchayat**	**Forest Range**	**Forest Division/ District**	**Geo-Cordinates**	**Area (In acres)**
1	Dada Tulsa Samadhi	Dada Tulsa	Balali	Dadri	Charkhi Dadri	28°30'13"N 76°10'38"E	125
2	Peer Gorakhnath Temple	Gorakhnath	Changrod	Dadri	Charkhi Dadri	28°28'06"N 76°12'27"E	85
3	Baba Kaandal Temple	Baba Kandal, Chand Wali Maata	Sanwar	Dadri	Charkhi Dadri	28°43'46"N 76°17'42"E	60
4	Sadhana Hanuman Temple	Hanuman Ji	Chandeni	Dadri	Charkhi Dadri	28°28'38"N 76°06'50"E	30
5	Hanuman Temple	Hanuman Ji	Kheri Sanwal	Dadri	Charkhi Dadri	28°32'17"N 76°18'29"E	16
6	Dada Gosaai Temple	Dada Gosaai	Dohki	Dadri	Charkhi Dadri	28°39'04"N 76°09'28"E	15
7	Baba Johar Waala Dera	Baba Johar Wala	Mehrana	Dadri	Charkhi Dadri	28°31'50"N 76°19'20"E	12
8	Dadi Sati Maata Temple	Dadi Sati Maata	Kheri bura	Dadri	Charkhi Dadri	28°34'58"N 76°12'42"E	10
9	Dada Dohla Temple	Dada Dohla	Mehrana	Dadri	Charkhi Dadri	28°33'24"N 76°10'37"E	Aravalli Range
10	Dada Gosaai Dham	Dada Gosaai, Baba Jotram	Mankawas	Dadri	Charkhi Dadri	28°37'28"N 76°10'16"E	Aravalli Range

11	Maata Durga Mandir	Durga Maata	Atela Kalan	Dadri	Charkhi Dadri	28°34'54"N 76°06'37"E	Aravalli Range
12	Gufadhari Mandir	Gufadhari baba	Jhojhu Kalan	Dadri	Charkhi Dadri	28°30'49"N 76°09'13"E	Aravalli Range
13	Peer Baba	Peer Baba	Kaliyana	Dadri	Charkhi Dadri	28°33'55"N 76°12'03"E	Aravalli Range
14	Kapoori Ki Pahari Mandir	Baba Mukh Ram Nath	Ramnagar Kapoori	Dadri	Charkhi Dadri	28°33'28"N 76°17'09"E	Aravalli Range
15	Baba Mungipa Dham	Baba Mungipa, Baba Bhairu Nath	Shiswala	Dadri	Charkhi Dadri	28°33'57"N 76°06'02"E	Aravalli Range
16	Baba BalakNath Temple	Baba Balaknath	Tiwala	Dadri	Charkhi Dadri	28°33'35"N 76°07'56"E	Aravalli Range
17	Baba Rawat Nath Ashram	Baba Rawat Nath	Unnear Badhwana	Badhra	Charkhi Dadri	28°26'03"N 76°06'17"E	Aravalli Range
18	Baba Mand Mandir	Baba Mand	Mai Khurd	Badhra	Charkhi Dadri	28°27'20"N 76°06'55"E	Aravalli Range
19	Shyam Baba, Ramdev Ji Temple	Shyam Baba, Ramdev Ji	Norangawas Jattan	Badhra	Charkhi Dadri	28°24'54"N 76°03'15"E	Aravalli Range
20	Dada Chandan Sidh Dham	Sidh Dada Chandan	Chandwas	Badhra	Charkhi Dadri	28°29'36"N 75°58'18"E	270
21	Baba Johar Wala Dham	Baba Johar Wala	Ladawas	Badhra	Charkhi Dadri	28°35'42"N 75°55'56"E	185
22	Baba Haridas Dham	Baba Haridas	Nimar	Badhra	Charkhi Dadri	28°29'02"N 75°59'53"E	185

Table 5: Comparative Account of Identified Sacred Groves Across Forest Divisions and Ranges in Haryana					
Serial Number	**Division & Range**	**Number of Groves**	**Percentage**	**Area (Acres)**	**Area (%)**
1	**Fatehabad - Division**	**16**	**14.82**	**789**	**13.4**
1.1	Fatehabad Range	8	7.41	408	6.93
1.2	Tohana Range	8	7.41	381	6.47
2	**Hisar - Division**	**24**	**22.22**	**1465**	**24.88**
2.1	Adampur Range	9	8.33	677	11.5
2.2	Hisar Range	8	7.41	490	8.32
2.3	Hansi Range	7	6.48	298	5.06
3	**Bhiwani - Division**	**46**	**42.59**	**2641**	**44.85**
3.1	Bhiwani Range	13	12.04	798	13.55
3.2	Loharu Range	19	17.59	1468	24.93
3.3	Siwani Range	5	4.63	293	4.98
3.4	Tosham Range	9	8.33	82	1.39
4	**Charkhi Dadri - Division**	**22**	**20.37**	**993**	**16.86**
4.1	Dadri Range	16	14.81	353	6
4.2	Badhra Range	6	5.56	640	10.87
	Total	**108**		**5888**	

Table 6: Distribution of Identified Sacred Groves by Area Class Across Forest Divisions in Haryana							
Serial Number	**Area Classes for Identified Sacred Groves**	**Charkhi Dadri**	**Bhiwani**	**Hisar**	**Fatehabad**	**Total**	**Percentage**
1	**Small-Scale Sacred Groves (1–50 Acres)**	5	26	11	10	52	48.15
2	**Medium-Small Sacred Groves (51–100 Acres)**	2	4	11	5	22	20.37
3	**Medium-Large Sacred Groves (101–150 Acres)**	1	6	1	0	8	7.41
4	**Large Sacred Groves (151–200 Acres)**	2	4	0	0	6	5.56
5	**Very Large Sacred Groves (Above 200 Acres)**	1	1	1	1	4	3.70
6	**Sacred Groves Within the Aravalli Range Ecosystem**	11	5	0	0	16	14.81
		22	46	24	16	108	

Table 7: Typological Distribution of Documented Sacred Grove Types Across Forest Divisions							
Serial Number	**Types of Groves**	**Charkhi Dadri**	**Bhiwani**	**Hisar**	**Fatehabad**	**Total**	**Percentage**
1	Temple/Mandir Groves	12	27	14	10	63	58.33
2	Samadhi Groves	1	1	0	0	2	1.85
3	Dera Groves	1	0	1	1	3	2.78
4	Dham Groves	5	10	1	1	17	15.74
5	Peer/Dargah Groves	2	2	2	1	7	6.48
6	Ashram Groves	1	2	0	1	4	3.70
7	Johra/Johri/Bani Groves	0	4	4	2	10	9.26
8	Dhunna Groves	0	0	2	0	2	1.85
		22	46	24	16	108	

Table 8: Typological Classification and Count of Deities Worshipped in Identified Sacred Groves			
Serial Number	**Typification of deities**	**Total**	**Percentage**
1	Numbers of Mythological Deities	4	5.71
2	Numbers of Regional Deities	13	18.57
3	Numbers of Local Village Based Deities	52	74.29
		69	

Table 9: Distribution of Sacred Groves by Number of Deities associated							
S.No.	**Number of Deities associated**	**Charkhi Dadri**	**Bhiwani**	**Hisar**	**Fatehabad**	**Total**	**Percentage**
1	Groves associated with Single Deity	18	41	21	12	92	85.19
2	Groves associated with More than One deity	4	5	3	4	16	14.81
	Total Number of Groves	22	46	24	16	108	