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When Biodiversity Persists but Protection Weakens: Community Stewardship, Encroachment and the Future of Orans in the Thar Desert — Evidence from Dhok and Jajawa Sacred Groves, Rajasthan

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Abstract: Orans, the sacred groves of western Rajasthan, represent unique socio-ecological landscapes that have historically contributed to biodiversity conservation, livestock-based livelihoods, and cultural continuity in the Thar Desert. However, increasing pressures from encroachment, agricultural expansion, infrastructure development, and weakening traditional institutions have raised concerns regarding their long-term sustainability. Recent legal developments, including the recognition of Orans within the broader forest governance debate, have further highlighted the need to reassess existing conservation approaches. Against this background, the present study examines the ecological significance, conservation challenges, and future management of Dhok and Jajawa Orans in Barmer district, Rajasthan.

The study is based on household surveys conducted among 100 respondents (50 from each village), field observations, and geospatial analysis using Land Use/Land Cover (LULC) mapping and vegetation indices. The findings reveal important contrasts between the two sacred groves. Dhok Oran continues to benefit from strong religious significance, active community stewardship, and relatively lower levels of encroachment. In contrast, Jajawa Oran exhibits better vegetation condition, higher NDVI values, and considerable grazing potential, but faces greater pressure from agricultural expansion, residential development, and infrastructure growth. Survey results indicate that declining religious faith (95%), encroachment (91%), agricultural expansion (86%), and weak legal protection (82%) are perceived as the most significant threats to Oran conservation.

The study demonstrates that ecological quality alone cannot guarantee long-term conservation. While biodiversity and vegetation cover persist in many Orans, weakening cultural institutions and increasing land-use pressures threaten their sustainability. The findings further indicate strong public support for legal protection, official mapping, and boundary demarcation, alongside continued community participation in management. The study concludes that the future of Oran conservation lies in a hybrid governance framework that combines legal recognition, biodiversity conservation, community stewardship, and protection of traditional grazing rights. Such an approach can strengthen ecological resilience while safeguarding the cultural and livelihood functions of sacred landscapes in the Thar Desert.

Keywords: Orans, Sacred Groves, Community Stewardship, Biodiversity Conservation, LULC, NDVI, Thar Desert

1. INTRODUCTION

Sacred groves represent one of the oldest forms of community-based conservation in the world, where natural landscapes are protected through religious beliefs, cultural traditions, and customary institutions (Gadgil & Vartak, 1975; Malhotra et al., 2001). In India, sacred groves occur under different local names and continue to play an important role in conserving biodiversity, sustaining ecosystem services, and preserving cultural heritage (Gadgil & Chandran, 1992; Rathore, 2024). In the arid and semi-arid regions of western Rajasthan, sacred groves are commonly known as Orans. These traditionally protected landscapes have historically served as important ecological and socio-cultural institutions, providing grazing resources, shelter for wildlife, fuelwood, medicinal plants, and spaces for religious practices (Gold & Gujar, 1989; Rathore, 2024).

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The Thar Desert is characterized by harsh climatic conditions, limited rainfall, frequent droughts, and fragile ecosystems. In such an environment, Orans function as ecological refugia that support vegetation cover and provide critical resources for rural communities. For centuries, local communities have protected these sacred landscapes through customary norms and religious beliefs associated with local deities. The conservation of Orans therefore represents a unique example of the interaction between ecological sustainability and cultural traditions (Gold & Gujar, 1989; Rathore, 2024).

Apart from their cultural significance, Orans contribute significantly to biodiversity conservation. These landscapes often contain native tree species such as *Prosopis cineraria* (Khejri), *Tecomella undulata* (Rohida), *Ziziphus nummularia* (Ber), and a variety of grasses and shrubs that support livestock and wildlife. In drought-prone regions, Orans act as reserve grazing grounds and provide ecological resilience against environmental stress. Their role in soil conservation, carbon sequestration, groundwater recharge, and micro-climatic regulation further highlights their environmental importance (Gadgil & Vartak, 1976; Rathore, 2024).

Despite their significance, many Orans across western Rajasthan are experiencing increasing pressures from agricultural expansion, encroachment, infrastructure development, and changing socio-cultural values. Traditional systems of protection that once ensured their survival are gradually weakening. Declining religious adherence among younger generations and increasing competition over land resources have contributed to the degradation of several sacred groves (Chandran & Hughes, 1997). Field observations from different parts of the Thar Desert indicate that many smaller Orans are particularly vulnerable to encroachment by influential individuals and competing land uses.

Recent debates regarding forest governance and conservation policy have renewed interest in the legal status of community-conserved landscapes. Following discussions surrounding the concept of deemed forests and legal protection of ecologically significant areas, questions have emerged regarding the future conservation of Orans. While stronger legal protection may help prevent encroachment and land-use conversion, transferring these landscapes entirely under state control may undermine the traditional community-based management systems that have historically sustained them. Such an approach may also restrict customary grazing practices and weaken the participation of local communities in conservation efforts (Gupta, 1998; Pathak, 2009).

Recent developments in forest governance have further strengthened the debate surrounding the conservation and legal status of Orans in Rajasthan. In a landmark judgment in *T.N. Godavarman Thirumulpad v. Union of India* (2024), the Supreme Court recognized Oran lands as forests and directed the State of Rajasthan to undertake detailed mapping and classification of these sacred landscapes. The judgment acknowledged the ecological, cultural, and livelihood significance of Orans and emphasized their role in biodiversity conservation, water resource protection, soil conservation, and sustainable resource management. Subsequently, the Forest Department, Government of Rajasthan, identified approximately 380,222 hectares of Orans and other ecologically significant landscapes across 31 districts of the state. Among these, Jaisalmer accounted for the largest area (202,130.93 ha), followed by Barmer (82,997.51 ha) and Balotra (18,301.35 ha). Together, Barmer and Balotra contain more than 101,000 hectares of Oran and ecological landscapes, highlighting the regional significance of western Rajasthan in the conservation of community-managed ecosystems. These developments have brought Orans to the centre of contemporary conservation and forest governance debates. However, while legal recognition offers opportunities for protection against encroachment and land-use conversion, concerns remain regarding excessive bureaucratic control and the potential marginalization of traditional community institutions. Therefore, the challenge lies not merely in granting legal status to Orans, but in developing conservation frameworks that effectively integrate formal protection with community stewardship.

Table 1.

Extent of Oran and Ecologically Significant Landscapes Identified by the Rajasthan Forest Department		
Administrative Unit	Area under Orans and Ecologically Significant Landscapes (ha)	Share of Rajasthan Total (%)
Rajasthan (Total)	380,222.10	100.00
Jaisalmer (2011)	202,130.93	53.16
Barmer (2011)	101,298.86	26.64

Source: Forest Department, Government of Rajasthan.

The Rajasthan Forest Department has identified approximately 380,222 hectares of Orans and other ecologically significant landscapes across the state. Among these, Jaisalmer alone accounts for more than half (53.16%) of the total area, while Barmer contributes 26.64%, highlighting the exceptional importance of the western Thar Desert in conserving

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community-managed ecosystems. Together, these districts represent the core landscape of Rajasthan's Oran network and play a crucial role in biodiversity conservation, grazing support, and the preservation of traditional cultural heritage.

This debate highlights the need to reconsider existing conservation approaches for Orans. Rather than viewing them solely as forest resources or purely cultural landscapes, there is a need to recognize their multifunctional character as ecological, pastoral, and socio-cultural systems. A conservation framework that combines legal protection with community stewardship may provide a more sustainable pathway for safeguarding these landscapes while maintaining local livelihoods and cultural traditions.

Against this background, the present study examines the conservation challenges and future management of Orans in the Thar Desert of Rajasthan through evidence from Dhok and Jajawa sacred groves located in Barmer district. Using household survey responses, field observations, and ecological assessment, the study investigates the socio-economic dependence of local communities on Orans, emerging threats to their sustainability, and community perceptions regarding legal protection and conservation. The study further evaluates whether a community-based conservation model can offer a more effective alternative to exclusive state-controlled management.

Although several studies have documented the ecological and cultural significance of Orans in Rajasthan, limited attention has been paid to the implications of recent legal developments, particularly the recognition of Orans within the broader deemed forest debate. Furthermore, few studies have examined how local communities perceive the balance between legal protection and community stewardship. The present study attempts to address this gap through a comparative assessment of Dhok and Jajawa Orans.

The study investigates the ecological, socio-economic, and cultural significance of Dhok and Jajawa Orans, analyses emerging conservation challenges and community perceptions, and proposes a conservation framework that integrates biodiversity protection, legal safeguards, and community stewardship for the sustainable management of Orans in the Thar Desert.

2. MATERIALS AND METHODS

Study Area

The present study was conducted in the Thar Desert region of Rajasthan, with a specific focus on Dhok and Jajawa Orans located in Barmer district. The Thar Desert is characterized by an arid climate, low and erratic rainfall, high temperatures, sparse vegetation, and frequent drought conditions. Livestock rearing and rain-fed agriculture constitute the major livelihood activities in the region. In such an environment, Orans play a significant role in supporting biodiversity, providing grazing resources, and maintaining ecological stability.

Dhok and Jajawa Orans were selected as case studies due to their ecological importance, cultural significance, and increasing exposure to anthropogenic pressures such as encroachment and land-use transformation. Both Orans continue to support local communities through grazing resources, religious activities, and ecosystem services, making them suitable sites for examining contemporary conservation challenges.

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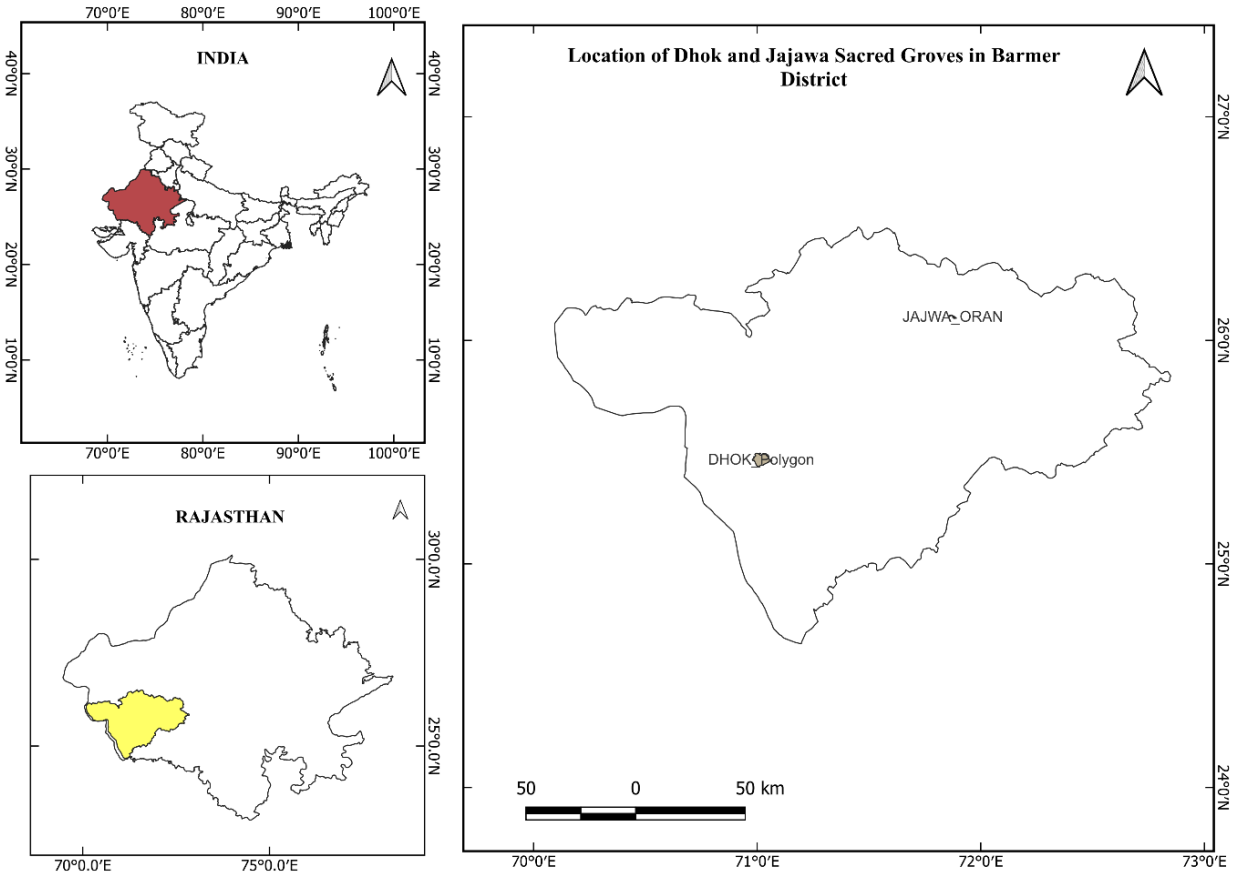

Figure 1. Study area map

3. DATA COLLECTION AND ANALYSIS

The study is based on both primary and secondary data sources. Primary data were collected through a household survey of 100 respondents (50 each from Dhok and Jajawa villages) and supplemented by field observations on vegetation, grazing activities, and encroachment. Secondary information was obtained from research articles, government reports, census publications, and policy documents. Geospatial analysis, including Land Use/Land Cover (LULC) mapping and vegetation indices, was used to assess the ecological condition of the selected Orans. Survey data were analysed using frequency and percentage statistics and interpreted alongside field observations and geospatial findings. Participation in the survey was voluntary, and confidentiality of respondents was maintained throughout the study.

4. RESULTS AND DISCUSSION

The results are based on household surveys, field observations, and geospatial analysis conducted in Dhok and Jajawa Orans. The findings provide insights into the socio-economic importance, cultural significance, ecological condition, conservation challenges, and future management of these sacred groves. By comparing the two case studies, the study highlights the complex relationship between biodiversity conservation, community stewardship, and emerging threats to Oran sustainability in the Thar Desert.

4.1 Socio-Economic Dependence on Orans

Orans continue to play a vital role in supporting rural livelihoods and sustaining the pastoral economy of western Rajasthan. The survey findings indicate that local communities derive multiple benefits from these sacred landscapes, including grazing resources, fodder availability, ecological services, and cultural values. At the same time, respondents expressed growing concern regarding encroachment, declining religious faith, and the need for stronger conservation measures. Community perceptions regarding the importance and future management of Orans are presented in Table 2.

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Table 2.

Community Perceptions on Oran Conservation (n = 100)			
S.No.	Question	Yes (%)	No (%)
1	Is the Oran important for the village?	96	4
2	Do you depend on Oran for grazing?	88	12
3	Does Oran help in fodder availability?	84	16
4	Does Oran support biodiversity conservation?	79	21
5	Is encroachment increasing in Orans?	91	9
6	Has religious faith declined compared to the past?	90	10
7	Should Orans receive legal protection?	94	6
8	Should Oran boundaries be officially mapped and demarcated?	87	13
9	Should community participation continue in management?	92	8
10	Should Orans be managed exclusively by the Forest Department?	14	86

Source: Based on Primary Survey, 2025-26.

The survey findings indicate a strong level of community dependence and attachment towards Orans. A majority of respondents (96%) considered Orans important for their villages, while 88% reported dependence on Orans for grazing activities. Similarly, 84% acknowledged the role of Orans in providing fodder resources and 79% recognized their contribution to biodiversity conservation. The results further reveal widespread concern regarding increasing encroachment, with 91% of respondents perceiving encroachment as a growing threat. Notably, 94% supported legal protection of Orans and 92% emphasized the need for continued community participation in management. However, only 14% favored exclusive Forest Department control, suggesting that local communities prefer a conservation framework that combines legal safeguards with community stewardship.

The survey conducted among 100 respondents from Dhok and Jajawa villages revealed that agriculture and livestock rearing constitute the primary livelihood activities of local households. The arid environment of the Thar Desert makes grazing resources particularly valuable, and both Orans continue to function as important common property resources supporting local pastoral economies.

Respondents reported that Orans provide grazing grounds, fodder resources, shade for livestock, and ecological security during periods of drought. The dependence of local communities on Oran resources highlights their continued relevance in sustaining rural livelihoods. This finding is particularly significant in the context of western Rajasthan, where livestock rearing remains one of the most resilient economic activities.

The results indicate that Orans should not be viewed merely as sacred landscapes but also as socio-economic assets that contribute directly to household well-being and livelihood security.

Recent developments in forest governance have significantly transformed the debate surrounding the conservation of Orans in Rajasthan. In a landmark judgment in *T.N. Godavarman Thirumulpad v. Union of India* (2024), the Supreme Court recognised Oran lands as forests and directed the State of Rajasthan to undertake detailed mapping and classification of these sacred landscapes. The judgment acknowledged the ecological, cultural, and livelihood significance of Orans and emphasized their role in biodiversity conservation, water resource protection, soil conservation, and sustainable resource management. At the same time, the judgment highlighted the importance of community participation and recommended a decentralised, bottom-up approach to conservation. While legal recognition offers an opportunity to protect Orans from encroachment and land-use conversion, concerns remain regarding excessive bureaucratic control and the marginalisation of traditional community institutions. Therefore, the challenge lies not merely in granting legal status to Orans but in developing conservation frameworks that integrate formal protection with community stewardship.

4.2 Cultural and Religious Significance: Contrasting Experiences of Dhok and Jajawa

The contrasting experiences of Dhok and Jajawa highlight the varying influence of cultural institutions, community participation, ecological characteristics, and governance structures on Oran conservation. To better understand these differences, a comparative assessment of the two sacred groves is presented in Table 4.

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Table 3.

Comparative Ecological, Cultural and Governance Characteristics of Dhok and Jajawa Orans			
Dimension	**Indicator**	**Dhok Oran**	**Jajawa Oran**
Cultural Significance	Religious Importance	Very High	Moderate
	Daily Worship	Regular	Occasional
	Pilgrim/Visitor Footfall	High	Low
	Community Participation in Religious Activities	Strong	Moderate
Governance and Protection	Community Monitoring	Strong	Weak
	Demand for Legal Protection	High	Very High
	Demand for Boundary Demarcation	High	Very High
	Vulnerability to Encroachment	Low	High
Land Use Change	Agricultural Expansion	Limited	Significant
	Housing Development within Oran	Moderate	Considerable
	Road Development Impact	High	High
Ecological Characteristics	Dominant Vegetation	Mixed Native Desert Species	Desi Babul Dominated
	Species Diversity	High	Moderate
	Grazing Importance	High	Very High
	Vegetation Condition	Moderate to Good	Good
	Mean NDVI (2021)	0.149	0.218
Conservation Outlook	Community Concern for Conservation	High	Very High
	Long-Term Conservation Risk	Moderate	High

Source: Based on Primary Survey, 2025-26

The comparative assessment highlights important differences in the conservation status of Dhok and Jajawa Orans. Dhok Oran continues to maintain strong religious significance, regular worship practices, and active community monitoring, which collectively function as informal conservation mechanisms. As a result, the Oran has experienced comparatively lower levels of encroachment and land-use transformation despite exhibiting moderate vegetation density. The presence of diverse native desert species, including Khejri, Kumat, Jaal, Phog, and Guggal, further enhances its ecological significance.

The evidence from Dhok and Jajawa demonstrates that the conservation of Orans is shaped by a complex interaction of ecological, cultural, and institutional factors. While Dhok benefits from strong religious stewardship and community monitoring, Jajawa illustrates how weakening traditional institutions can increase vulnerability to encroachment despite relatively good vegetation condition. These findings indicate that neither ecological quality nor cultural significance alone can ensure long-term sustainability. Effective conservation strategies must therefore integrate biodiversity protection, community participation, legal safeguards, and sustainable livelihood considerations within a common governance framework.

4.3 Ecological Importance of Dhok and Jajawa Orans

Field observations revealed important ecological differences between Dhok and Jajawa Orans. Dhok Oran supports a diverse assemblage of native desert species, including Khejri (*Prosopis cineraria*), Kumat (*Senegalia senegal*), Jaal (*Salvadora persica*), Ber (*Ziziphus* spp.), Neem (*Azadirachta indica*), Phog (*Calligonum polygonoides*), and Guggal (*Commiphora wightii*). However, local respondents reported a gradual decline in populations of Phog and Guggal, two ecologically important species adapted to arid environments. This decline may be associated with increasing anthropogenic pressure, grazing intensity, and changing environmental conditions. In contrast, Jajawa Oran is characterized by the dominance of mature Desi Babul (*Vachellia nilotica*) trees, which contribute significantly to vegetation cover and explain its comparatively higher NDVI values. During the monsoon season, Jajawa functions as an important grazing landscape and provides substantial fodder resources for livestock, thereby supporting the pastoral economy of surrounding villages. These observations suggest that while Dhok possesses higher species diversity and cultural significance, Jajawa exhibits stronger vegetation density and grazing potential. Together, the two Orans demonstrate the ecological diversity and multifunctional nature of sacred landscapes in the Thar Desert.

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Table 4.

NDVI and SAVI Based Ecological Assessment of Selected Orans (2021)					
S.No.	Oran Name	Mean NDVI	Mean SAVI	Vegetation Condition	Ecological Status
1	Dhok Oran	0.149	0.224	Moderate	Moderate
2	Jajawa Oran	0.218	0.327	Good	Very High

Source: Computed by the authors using Sentinel-2 imagery (2021) through Google Earth Engine and GIS-based analysis.

Although Jajawa exhibits higher NDVI and SAVI values than Dhok, field observations indicate greater encroachment and land-use transformation. This finding demonstrates that vegetation health alone cannot be considered a sufficient indicator of conservation success. Social institutions, cultural attachment, and community stewardship remain equally important determinants of long-term sustainability.

The NDVI and SAVI analysis reveals significant ecological differences between the two selected Orans. Jajawa Oran recorded a higher mean NDVI value (0.218) and SAVI value (0.327) compared to Dhok Oran, indicating relatively denser vegetation cover and better ecological condition. Consequently, Jajawa Oran was classified under a very high ecological status despite experiencing considerable anthropogenic pressures such as encroachment, road development, and agricultural expansion.

In contrast, Dhok Oran recorded a lower mean NDVI (0.149) and SAVI (0.224), indicating moderate vegetation density and ecological condition. However, Dhok continues to maintain strong cultural and religious significance, which has contributed to lower levels of encroachment and stronger community stewardship.

An interesting finding of the study is that ecological condition and conservation status do not always correspond directly. Although Jajawa exhibits better vegetation health than Dhok, it faces greater threats from land-use transformation due to weaker traditional protection mechanisms. Conversely, Dhok demonstrates how strong community faith and cultural attachment can contribute to the long-term protection of sacred landscapes even when vegetation indicators are comparatively lower.

These findings suggest that successful Oran conservation depends not only on ecological quality but also on the strength of community institutions and cultural values. Therefore, future conservation policies should integrate ecological indicators with social and governance dimensions rather than relying solely on vegetation-based assessments.

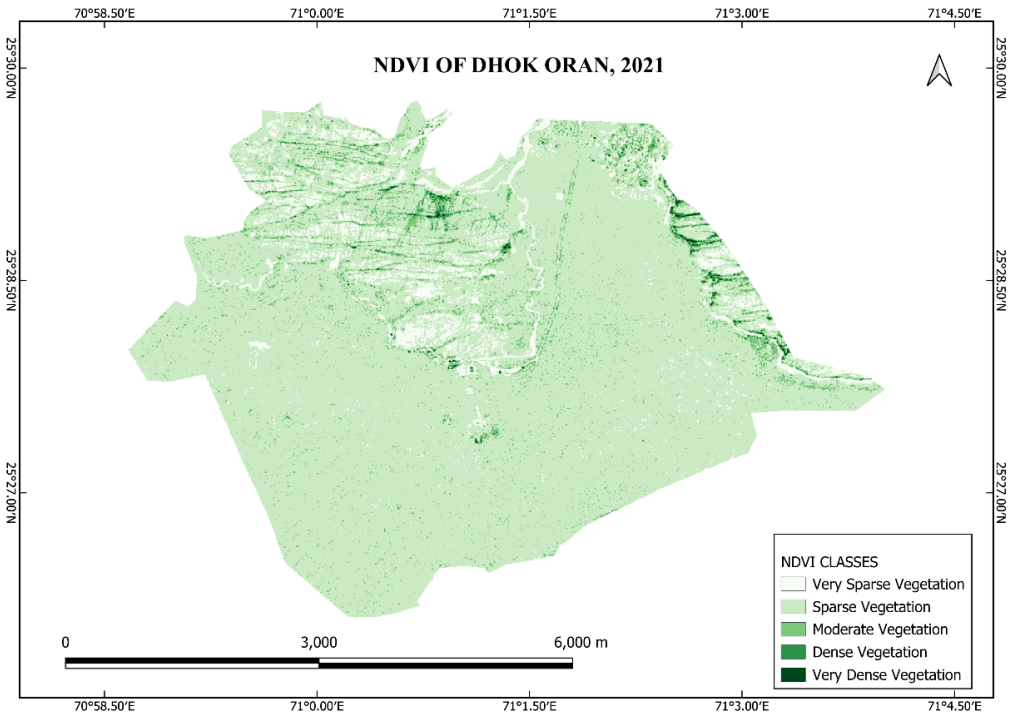

Figure 2.

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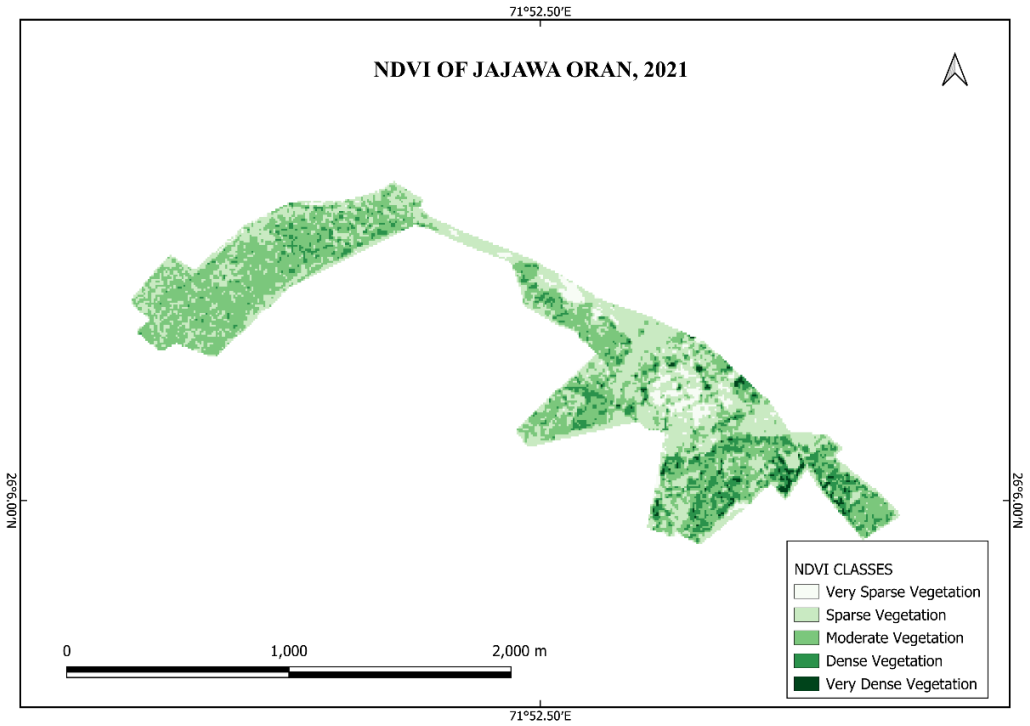

Figure 3.

4.4 Encroachment and Land Use Transformation

One of the most significant findings of the study concerns the growing threat of encroachment and land-use transformation in Orans. Although both Dhok and Jajawa continue to function as important ecological and socio-cultural landscapes, the intensity and nature of anthropogenic pressures differ considerably between the two sites.

Dhok Oran has experienced comparatively lower levels of encroachment, largely due to its strong religious significance and active community stewardship. The presence of a well-known local deity, regular religious activities, and community monitoring has helped maintain the traditional boundaries of the Oran. Consequently, unauthorized land-use changes remain relatively limited, and the sacred status of the landscape continues to act as an informal conservation mechanism. In contrast, Jajawa Oran has experienced substantial encroachment and land-use transformation. Field observations revealed that residential structures, roads, and agricultural expansion have progressively altered the traditional boundaries of the Oran. Community members estimated that more than thirty percent of the original Oran area has been affected by these activities. Despite retaining considerable vegetation cover and ecological value, increasing developmental pressures have weakened the integrity of the landscape.

The contrasting situations of Dhok and Jajawa suggest that the weakening of traditional cultural institutions, combined with increasing demand for land and infrastructure, has accelerated the fragmentation of sacred landscapes. The experience of Jajawa demonstrates that ecological condition alone cannot ensure long-term conservation when governance systems and community oversight become weaker.

Table 5.

Percentage Distribution of Land Use/Land Cover Classes in Dhok and Jajawa Orans (2021)			
Oran	**Vegetation/Grazing Land (%)**	**Wasteland (%)**	**Built-up Area (%)**
Dhok	80.33	17.32	2.16
Jajawa	66.55	17.92	15.34

Source: Author's classification and calculation based on Sentinel-2 satellite imagery (2021) processed in Google Earth Engine and analysed in QGIS.

The Land Use/Land Cover analysis provides further evidence of these conservation challenges. Vegetation and grazing land constitute the dominant land cover category in both Orans, highlighting their continued ecological and pastoral

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significance. Dhok Oran exhibits a higher proportion of vegetation and grazing land (80.33%) and a relatively low built-up area (2.16%), indicating that the landscape has remained largely intact under community protection. In contrast, Jajawa Oran records a substantially higher built-up area (15.34%), reflecting increasing settlement expansion and human intervention within the Oran boundary. Although vegetation cover remains relatively high, the expansion of built-up land indicates a gradual transformation of the traditional sacred landscape.

Table 6.

Perceived Threats to Orans	
Threat	Respondents (%)
Declining Religious Faith	95
Encroachment	91
Agricultural Expansion	86
Weak Legal Protection	82
Road Development and Infrastructure	63

Source: Based on Primary Survey, 2025-26

Community perceptions strongly support the observations derived from field surveys and geospatial analysis. The results indicate that declining religious faith (95%) is perceived as the most serious threat to Oran conservation, suggesting that traditional cultural mechanisms protecting these sacred landscapes are gradually weakening. Encroachment (91%) and agricultural expansion (86%) were also identified as major challenges, reflecting increasing pressure on Oran lands. Furthermore, weak legal protection (82%) highlights the need for official recognition and boundary demarcation to prevent unauthorized land use. Although road development and infrastructure (63%) were considered relatively less significant, they continue to contribute to the fragmentation and degradation of Oran ecosystems.

Taken together, the field observations, LULC analysis, and community perceptions reveal a common pattern. While Dhok Oran continues to benefit from strong cultural protection and relatively limited land-use transformation, Jajawa Oran demonstrates how weakening traditional institutions can increase vulnerability to encroachment despite the presence of good vegetation cover and ecological potential. These findings suggest that the long-term sustainability of Orans depends not only on ecological condition but also on the strength of community institutions, legal safeguards, and effective land-use governance.

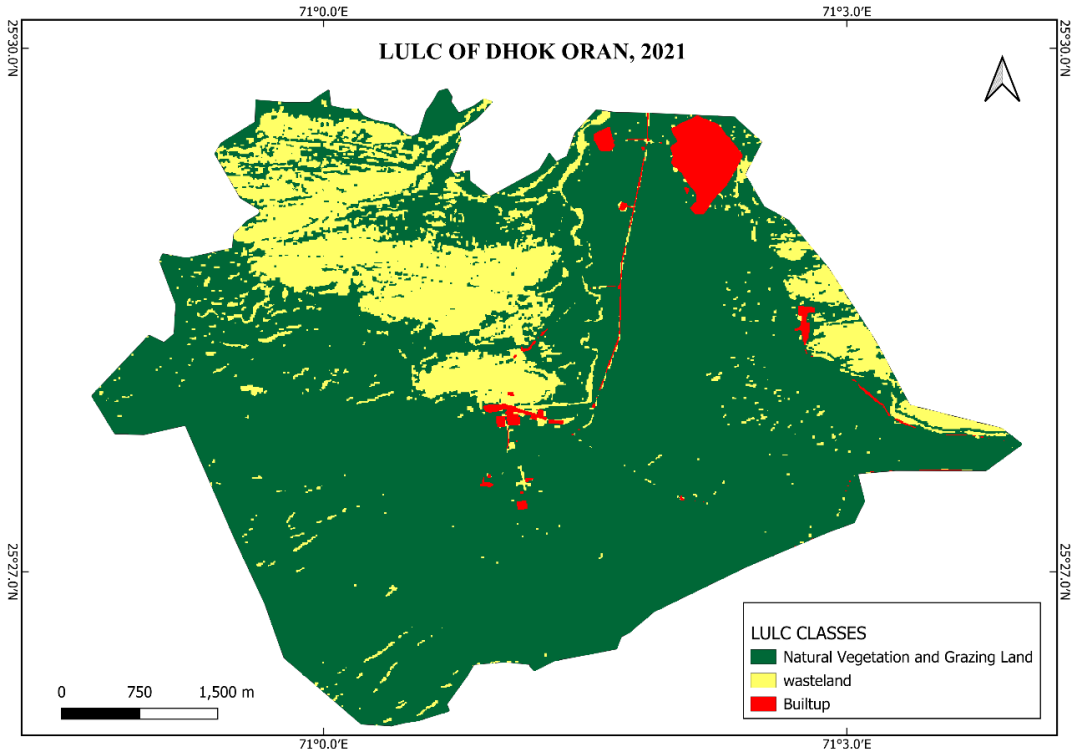

Figure 4.

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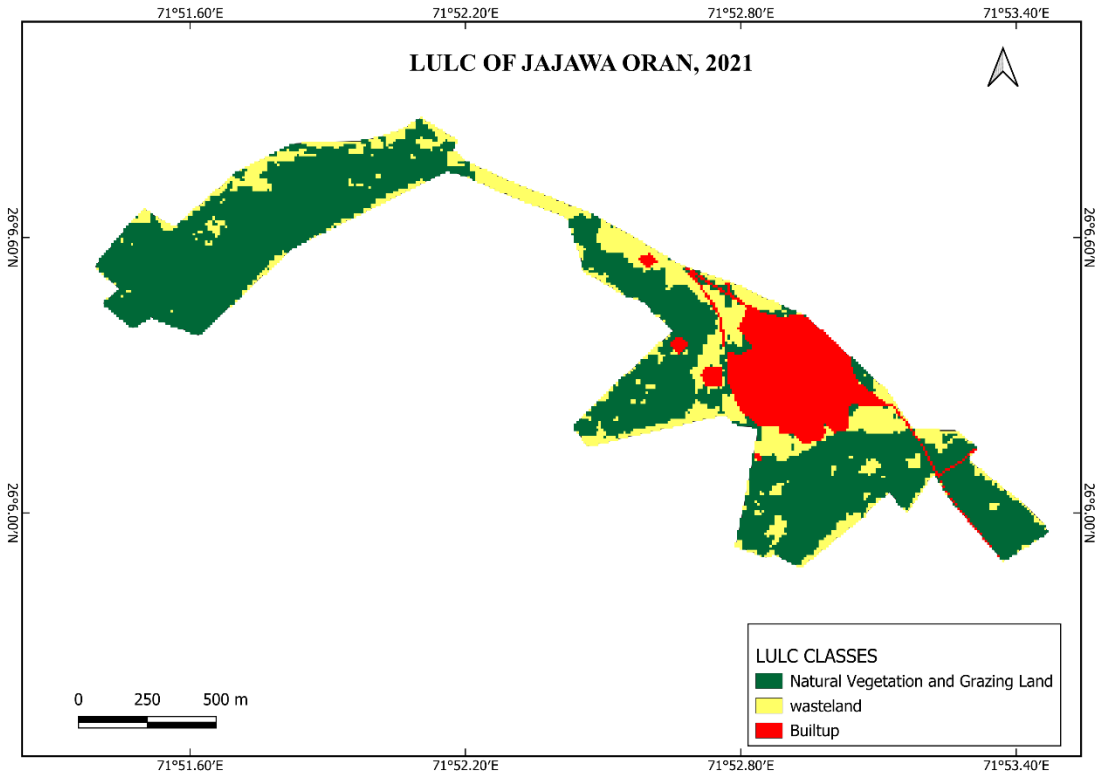

Figure 5.

4.5 Community Perceptions Regarding Conservation

Survey responses indicate a strong consensus regarding the importance of conserving Orans. Respondents from both villages acknowledged the ecological, cultural, and economic value of these landscapes and expressed concern about increasing encroachment.

Interestingly, community members did not advocate unrestricted state control over Orans. Instead, most respondents supported stronger legal protection while simultaneously emphasizing the importance of retaining community ownership and participation.

Many respondents argued that the absence of clearly demarcated boundaries contributes to land disputes and unauthorized encroachment. Consequently, there was widespread support for scientific mapping, boundary demarcation, and official recognition of Oran lands.

The survey findings indicate that local communities are not opposed to legal intervention. Rather, they seek legal safeguards that strengthen community stewardship rather than replace it.

Table 7.

Preferred Conservation Strategy	
Conservation Option	Respondents (%)
Community-Based Legal Protection	68
Joint Community-Government Management	18
Forest Department Control	9
Traditional Religious Protection Only	5

Source: Based on Primary Survey, 2025-26

Community preferences clearly indicate support for participatory conservation approaches. Nearly 68% of respondents favored community-based legal protection as the most suitable strategy for safeguarding Orans. An additional 18% preferred a joint management system involving both communities and government institutions. In contrast, only 9% supported exclusive Forest Department control, while merely 5% believed that traditional religious protection alone

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would be sufficient. These results suggest that local communities recognize the limitations of both purely traditional and purely bureaucratic conservation approaches, and instead advocate a hybrid model that combines legal recognition with active community involvement

4.6 Deemed Forests or Community-Based Conservation?

Recent legal developments, particularly the Supreme Court's recognition of Orans as forests under the broader framework of the *T.N. Godavarman Thirumulpad v. Union of India* judgment, have revived important debates regarding the future governance and conservation of sacred landscapes in Rajasthan. While legal recognition provides an opportunity to safeguard Orans from encroachment and land-use conversion, the findings from Dhok and Jajawa suggest that conservation cannot be achieved through legal classification alone.

The two case studies reveal contrasting yet complementary dimensions of Oran conservation. Dhok Oran continues to enjoy strong religious significance, regular worship practices, and active community stewardship. Despite exhibiting comparatively lower NDVI values (0.149) and moderate ecological status, the Oran has experienced relatively limited encroachment. The presence of culturally important species such as Khejri (*Prosopis cineraria*), Kumat (*Senegalia senegal*), Jaal (*Salvadora persica*), Phog (*Calligonum polygonoides*), and Guggal (*Commiphora wightii*) further enhances its ecological value. The continued influence of local religious beliefs and social norms has acted as an informal governance mechanism that discourages unauthorized land-use change.

In contrast, Jajawa Oran presents a different conservation reality. Although the Oran exhibits better vegetation condition, higher NDVI (0.218), higher SAVI (0.327), and extensive stands of mature Desi Babul (*Vachellia nilotica*), it has experienced substantial encroachment in the form of residential expansion, road construction, and agricultural land conversion. Field observations indicate that more than thirty percent of the traditional Oran area has been affected by such activities. The comparatively weaker religious attachment and limited community monitoring in Jajawa have reduced the effectiveness of traditional conservation mechanisms. This demonstrates that good ecological condition alone does not guarantee long-term protection when governance institutions are weak.

The survey findings further reinforce this argument. A large majority of respondents supported legal protection of Orans (94%), official mapping and boundary demarcation (87%), and continued community participation in management (92%). At the same time, only a small proportion supported exclusive Forest Department control. These responses indicate that local communities recognize the need for stronger legal safeguards but do not favour conservation approaches that exclude traditional users and customary institutions.

The evidence from Dhok and Jajawa therefore suggests that the conservation challenge is not a choice between deemed forest status and traditional management. Rather, it involves finding an appropriate balance between formal legal protection and community stewardship. Exclusive reliance on traditional faith-based protection may be insufficient in areas where cultural attachment is weakening, as observed in Jajawa. Conversely, complete bureaucratic control may undermine local participation, grazing rights, and community responsibility towards conservation. The findings strongly support a hybrid conservation model in which legal recognition, scientific mapping, and administrative protection are combined with community participation, customary grazing practices, and local stewardship. Such an approach is more likely to ensure the long-term ecological and socio-cultural sustainability of Orans in the Thar Desert.

4.7 Towards a Community-Based Legal Protection Framework

The findings of this study indicate that neither traditional protection systems nor exclusive state control can independently ensure the long-term conservation of Orans. The contrasting experiences of Dhok and Jajawa demonstrate that successful conservation depends upon the integration of ecological protection, community participation, and legal recognition. While Dhok highlights the conservation benefits of strong cultural attachment and community stewardship, Jajawa illustrates the vulnerability of sacred landscapes when traditional institutions weaken and legal safeguards remain inadequate.

In view of these findings, the study proposes a community-based legal protection framework for Oran conservation. The first step should involve the scientific mapping and official demarcation of Oran boundaries to prevent encroachment and resolve land-use conflicts. Second, Orans should receive formal legal recognition as protected community-managed landscapes, ensuring protection from unauthorized conversion while preserving traditional access rights. Third, village-level Oran management committees should be established to facilitate local participation in decision-making, monitoring, and conservation activities. Fourth, local communities should be actively involved in reporting encroachment, regulating resource use, and maintaining ecological integrity. Fifth, traditional grazing rights and livelihood functions must be safeguarded, recognizing the critical role of Orans in supporting pastoral economies in the Thar Desert. Finally,

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biodiversity conservation initiatives should be integrated with local cultural traditions and indigenous ecological knowledge, thereby strengthening both ecological resilience and community ownership.

The broader policy implications of this study extend beyond Dhok and Jajawa. Following the recent identification of extensive Oran and ecological landscapes in Barmer, Balotra, and other districts of western Rajasthan, conservation strategies must move beyond conventional forest governance models. The future of Oran conservation lies not in replacing community stewardship with state control, but in creating institutional arrangements where legal protection and community management function together. Such a hybrid governance framework can simultaneously protect biodiversity, strengthen rural livelihoods, prevent encroachment, and preserve the cultural heritage associated with sacred landscapes. Therefore, community-based legal protection emerges as the most appropriate pathway for ensuring the long-term sustainability of Orans in the Thar Desert.

5. CONCLUSION

The present study assessed the ecological significance, socio-economic importance, conservation challenges, and future management of Dhok and Jajawa Orans in the Thar Desert of Rajasthan. Based on field observations, household surveys, and geospatial analysis, the following conclusions can be drawn:

1. **Orans continue to function as important socio-ecological systems** that support biodiversity conservation, livestock grazing, fodder availability, and cultural traditions in the arid environment of western Rajasthan.
2. **Dhok and Jajawa exhibit contrasting conservation realities.** Dhok Oran maintains strong religious significance, active community stewardship, and relatively lower levels of encroachment, whereas Jajawa Oran experiences greater pressure from agricultural expansion, residential development, and infrastructure growth despite possessing better vegetation condition and higher NDVI values.
3. **Ecological condition alone is not a sufficient indicator of conservation success.** The case of Jajawa demonstrates that landscapes with good vegetation cover may still be highly vulnerable to land-use transformation when traditional institutions and community monitoring become weak.
4. **Declining religious faith emerged as the most significant perceived threat** to Oran conservation, followed by encroachment, agricultural expansion, and weak legal protection. This indicates that traditional faith-based conservation mechanisms are gradually weakening in many areas.
5. **Local communities continue to depend heavily on Orans** for grazing, fodder resources, and ecological security, highlighting their continuing importance for rural livelihoods and the pastoral economy of the Thar Desert.
6. **There is strong public support for legal protection of Orans.** Most respondents favoured official mapping, boundary demarcation, and legal recognition of Oran lands to prevent encroachment and land-use conversion.
7. **Communities do not support exclusive state control over Orans.** Instead, respondents preferred conservation approaches that combine legal safeguards with community participation and traditional management practices.
8. **The findings support a community-based legal protection model** rather than a purely bureaucratic forest governance framework. Conservation efforts are likely to be more effective when legal recognition complements, rather than replaces, community stewardship.
9. **The recent recognition of Orans within the broader deemed forest debate provides an important opportunity for conservation**, but future policies must ensure that biodiversity protection, grazing rights, community participation, and cultural heritage are addressed simultaneously.
10. **The long-term sustainability of Orans in the Thar Desert depends upon a hybrid governance framework** that integrates legal protection, scientific mapping, boundary demarcation, biodiversity conservation, traditional knowledge, and community-led management.
11.

In conclusion, the future of Oran conservation lies not in choosing between state control and traditional management, but in creating a balanced conservation framework where legal protection and community stewardship work together to safeguard these unique sacred landscapes for future generations.

REFERENCES

[1]. Arid Forest Research Institute. (2004). *Annual report 2003–04*. Arid Forest Research Institute, Jodhpur.
[2]. Bhasin, V. (1999). Religious and cultural perspective of a sacred site: Sitabari in Rajasthan. *Journal of Human Ecology, 10*, 329–340.
[3]. Chandran, M. D. S., Gadgil, M., & Hughes, J. D. (1998). Sacred groves of the Western Ghats. In P. S. Ramakrishnan, K. G. Saxena, & U. M. Chandrashekara (Eds.), *Conserving the sacred for biodiversity management* (pp. 211–231). Oxford & IBH Publishing.

DOI: 10.17148/IARJSET.2026.13636

[4]. Gadgil, M., & Vartak, V. D. (1975). Sacred groves of India: A plea for continued conservation. *Journal of the Bombay Natural History Society, 72*, 314–320.
[5]. Gadgil, M., & Vartak, V. D. (1976). Sacred groves of the Western Ghats in India. *Economic Botany, 30*(2), 152–160. https://doi.org/10.1007/BF02862961
[6]. Gold, A. G., & Gujar, B. R. (1989). Of gods, trees, and boundaries: Divine conservation in Rajasthan. *Asian Folklore Studies, 48*(2), 211–229. https://doi.org/10.2307/1177918
[7]. Jha, M., Vardhan, H., Chatterjee, S., Kumar, K., & Sastry, A. R. K. (1998). Status of Orans (sacred groves) in Peepasar and Khejarli villages in Rajasthan. In P. S. Ramakrishnan, U. M. Chandrashekara, & K. G. Saxena (Eds.), *Conserving the sacred for biodiversity management* (pp. 263–275). Oxford & IBH Publishing.
[8]. Krishna, N., & Singh, A. (2014). *Ecological traditions of India: Rajasthan* (Vol. 10). C.P.R. Environmental Education Centre.
[9]. Malhotra, K. C., Gokhale, Y., Chatterjee, S., & Srivastava, S. (2007). *Sacred groves of India: An overview*. Aryan Books International.
[10]. Pandey, D. N., & Singh, S. (1995a, May 21). *Aravalli ke Deovan*. Rajasthan Patrika.
[11]. Pandey, D. N., & Singh, S. (1995b). Traditions of sacred groves in Aravallis. *Wastelands News*, April–June, 3–6.
[12]. Pathak, N. (2009). *Community conserved areas in India: A directory*. Kalpavriksh.
[13]. Ramakrishnan, P. S., Saxena, K. G., & Chandrashekara, U. M. (Eds.). (1998). *Conserving the sacred for biodiversity management*. Oxford & IBH Publishing.
[14]. Rathore, M. S. (2024). Sacred groves: A bastion of biodiversity and cultural heritage. *International Education and Research Journal (IERJ), 10*(1), 1–4. https://doi.org/10.21276/IERJ24961214623664
[15]. Singh, A. (2011). *Orans: Sacred groves of Rajasthan*. Eco-Heritage.
[16]. Singh, A., & Bathla, N. (2021). *Oran atlas of Aravallis of Rajasthan*. Krishi Avam Paristhitiki Vikas Sansthan.
[17]. Singh, G. S., & Saxena, K. G. (1998). Sacred groves in the rural landscape: A case study of Shekhala village in Rajasthan. In P. S. Ramakrishnan, K. G. Saxena, & U. M. Chandrashekara (Eds.), *Conserving the sacred for biodiversity management*. Oxford & IBH Publishing.
[18]. Singh, J. (2017). *Rajasthan ke pavitra upvan: Sambhavit khatre aur prabandhan neetiyan*. Arid Forest Research Institute, Jodhpur.

