Sacred Groves: Traditional Way of Conserving Plant Diversity in Block Bhalwal of Jammu District (J&K)

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Abstract: ***Sacred groves are patches of native vegetation traditionally protected by local communities and are significant examples of in situ biodiversity conservation. The Present study was conducted in 16 sacred groves, distributed over nine villages of Bhalwal block in Jammu district (J&K), with the objective of studying diversity of trees species in these sacred groves and role played by them in biodiversity conservation. During the study a total of 54 tree species belonging to 42 genera and 25 families were found in these sacred groves. Fabaceae was the dominant family followed by Moraceae. The IVI was found highest for Mangifera indica (36.159) followed by Ficus benghalensis (35.379). The overall tree diversity in sacred groves calculated by Shannon Weiner index was found to be 3.43. This study also highlighted the various threats faced by the sacred groves like construction activities, grazing of live stocks and modernization.***

Keywords: sacred groves, biodiversity, Bhalwal, IVI

1. Introduction

Sacred groves are tracts of virgin forests with rich diversity, which have been protected by the local people over centuries due to their cultural and religious beliefs and taboos that the deities reside in them and protect the villagers from different calamities (Khan *et al*., 2008). Sacred groves are one of the most valuable but primitive practices of nature conservation. Such forests are rich in biological diversity and harbor many endangered plant species including rare herbs and medicinal plants. Every sacred grove carries its own legends, lore and myths which form the integral part of the sacred groves. Sacred groves are distributed across the globe and diverse cultures recognize them in different ways encoding various rules for their protection the institution of sacred groves is very ancient and widespread in most parts of India and in spite of increase in human population, sacred groves have survived under a variety of ecological situations (Ramakrishnan *et al*., 1998). Over 50,000 sacred groves have so far been reported from different parts of India (Malhotra, 2001). Most of the sacred groves reported from India are in the Western Ghats, North Eastern India, and Western Ghats. Keeping in view the role of the sacred groves as treasure of repositories of variety of tree species the present study was conducted in some prominent groves of block Bhalwal of Jammu, J&K.

2. Literary Survey

Sacred groves have existed from time immemorial all over the world as patches of densely wooded areas, harboring unique flora and fauna with perennial water sources in the vicinity. It is believed that these sacred virgin forests date back to thousands of years when human society was in the primitive state. Gadgil and Vartak (1975) have traced the historical link of the sacred groves to the pre- agricultural, hunting and gathering stage of societies. Hence, these Virgin forests are believed to be pre-Vedic in origin. The concept of sacred groves is related to religious faith of people which contribute to conservation of biodiversity. References about sacred groves traced in Greek and Sanskrit classics. Sacred groves have also been reported from many parts of the world like Mexico, Ghana, Nigeria, China, Syria and Turkey, wherein there are areas where the tribal live and practice shifting cultivation (Kulkarni, 2005).

3. Previous Work

Phyto-sociological studies of a sacred grove in Mannarashala, Kerala by Gopikumar *et al*. (2004) was carried out with an objective to study the flora and to enlist the plants based on morphology and growth habitat. Chandrakant *et al.* (2006) conducted a study in the sacred groves of Parinche valley, Pune district of Maharastra to understand the status and importance of common cultural aspects and religious values in conservation. Gupta and Sharma (2013) studied diversity of vegetation in the sacred groves and role played by them in phyto-diversity conservation in Rajouri (J&K).

4. Study Area

Keeping in view the role of sacred groves in biodiversity conservation through belief of local peoples and taboos associated with them present study was conducted in 16 sacred groves, distributed over nine villages of Bhalwal block in Jammu district (J&K).The detail of these groves is given in table 1. Block Bhalwal is one of the eight blocks of district Jammu and consists of 47 villages. Topography of the area is semi arid type locally known as the “Kandi ”. Population of the area is inhabited by people of both Hindu and Muslim communities. Every community in the area has their deity and a temple dedicated to it. In the villages, a small forest patch is conserved around the temple. Cutting

of trees, extraction of timber, fodder is prohibited in these sacred groves.

5. Methodology

To study the role of sacred groves in phytodiversity conservation a preliminary survey was conducted, along with information collected from different sources. Various sacred places in the study area were identified. A total of 45 sample plots of 10 m × 10 m size were laid randomly within different sacred groves. The number of sample plots in each sacred grove depended on the size of the sacred grove but at least one sample plot was laid in each grove. In each sample plot the information regarding the tree species encountered, number of trees, and girth of tree at breast height (CBH), tree height and information regarding to disturbances in the groves was also collected from each sample plot.

6. Analysis of Data

The data collected from the sample plots in each sacred grove was analyzed for frequency, density, abundance, IVI and diversity of tree species using standard formulae.

IVI =importance value index (Curtis, 1959). **Shannon-Weiner Index:** (Shannon and Wiener, 1963).

$H = - \Sigma Pi \ln Pi$

Table 6.1: Name of sacred groves with their location, name of deity worshipped, community, area and number of tree species found in sacred groves studied

Name of sacred grove	*Name of deity*	*Community*	*Village*	*Area (hectares)*	*Number of tree species*
Baba Chirki temple	Baba Roachi Ram	Lengeh	Ranjan	1.75	12
Bua Sjawati temple	Bua Sjawati ji	Verma	Ambh	0.087	7
Baba Kalakh Nath temple	Baba Kalak Nath ji	Lengeh	Ambh	0.093	4
Baba Jiyonath temple	Baba Jiyonathji	Banotra	Aghore	0.25	9
Baba Kaliveer temple	Baba Kaliveer ji	Jamwal	Jandial	0.375	23
Bua Sjawati temple	Bua Sjawati ji	Sudan	Ranjan	0.125	18
Bua Dati temple	Bua Dati ji	Lengeh	Ranjan	0.125	17
Baba Kaan Dev temple	Baba Kaan Dev	Bansotra	Aghore	0.125	11
Baba Mathwar temple	Baba Ballo ji	-	Mathwar	3	14
Baba Sua temple	Baba Sua ji	Lengeh	Nargada	2.215	9
Hanuman temple	Lord Hanuman	All	Ambh	0.25	7
Paira wali Mata temple	Mata Vaishno Devi	All	Ambh	0.25	14
Peer Baba temple	Peer Baba	All	Jandial	0.125	12
Raja Mandlik temple	Raja Mandlik ji	All	Baran	0.75	3
Pata Sarovar	Baba Sar and Bua Sjawati	Kataria	Showa- Pata	0.25	12
Shiv temple	Lord shiva	All	Karwanda	0.25	4

Table 6.2: Showing quantitative analysis of tree species in sacred grove studied

Sr. No	*Botanical names*	*TBA m^2/ ha*	*Frequency (%)*	*Density(tree/ha)*	*I.V.I*
1	*Aegle marmelos*	7.707	15.556	0.542	16.660
2	*Acacia catechu*	0.307	4.444	0.098	2.388
3	*Acacia modesta*	0.169	2.222	0.049	1.209
4	*Acacia nilotica*	0.353	4.444	0.098	2.434
5	*Acacia tortilis*	0.253	2.222	0.049	1.293
6	*Adina cordifolia*	0.538	6.667	0.147	3.659
7	*Albizia lebbeck*	2.491	13.333	0.493	10.475
8	*Alistonia scholaris*	0.167	2.222	0.049	1.207
9	*Annona squamosa*	0.14	2.222	0.049	1.181
10	*Artocarpus lakoocha*	0.131	2.222	0.049	1.172
11	*Azadirachta indica*	0.14	2.222	0.049	1.181
12	*Bauhinia variegate*	0.929	28.889	0.196	10.509
13	*Bauhinia vahlii*	2.033	2.222	0.049	3.047
14	*Bombax ceiba*	2.653	11.111	0.393	9.152
15	*Butea monosperma*	0.662	6.667	0.147	3.782
16	*Cassia fistula*	1.051	13.333	0.344	7.734
17	*Citrus limon*	0.02	2.222	0.049	1.063

18	*Citrus medica*	0.147	2.222	0.049	1.188
19	*Cordia dichotoma*	0.037	4.444	0.098	2.123
20	*Crataeva nurvala*	1.576	4.444	0.098	4.080
21	*Dalbergia sisoo*	2.004	8.889	0.196	6.588
22	*Diospysos cordifolia*	0.856	2.222	0.049	1.886
23	*Eriobotrya japonica*	0.031	2.222	0.049	1.074
24	*Eucalpytus citridora*	0.042	2.222	0.049	1.085
25	*Ficus benghalensis*	20.887	15.556	1.184	35.379
26	*Ficus palmate*	0.036	2.222	0.049	1.078
27	*Ficus racemosa*	0.14	2.222	0.049	1.181
28	*Ficus religiosa*	19.433	26.667	0.74	32.994
29	*Ficus virens*	1.104	2.222	0.049	2.132
30	*Flacourtia indica*	2.253	15.556	0.296	9.081
31	*Grewia optiva*	3.944	6.667	0.444	9.660
32	*Grewia tiliifolia*	1.902	6.667	0.196	5.444
33	*Lannea coromandelica*	1.738	13.333	0.444	9.292
34	*Mangifera indica*	13.542	28.889	1.678	36.159
35	*Mallotus philippensis*	0.811	8.889	0.393	6.733
36	*Melia azedarach*	0.856	6.667	0.147	3.972
37	*Moringa olifera*	0.78	2.222	0.049	1.812
38	*Morus alba*	0.551	6.667	0.147	3.672
39	*Musa acuminita*	0.291	4.444	0.098	2.373
40	*Phyllostachys aurea*	0.12	2.222	0.049	1.161
41	*phyllanthus emblica*	0.253	2.222	0.049	1.293
42	*Phyllanthus officinalis*	0.022	2.222	0.049	1.065
43	*Polyathia longifolia*	0.022	2.222	0.049	1.065
44	*Punica granatum*	0.022	2.222	0.049	1.065
45	*syzygium cumini*	1.796	4.444	0.098	4.296
46	*Terminalia bellirica*	0.022	2.222	0.049	1.065
47	*Terminalia chebula*	0.044	2.222	0.049	1.087
48	*Tectona grandis*	0.022	2.222	0.049	1.065
49	*Toona ciliata*	2.107	8.889	0.196	6.248
50	*Thevetia peruviana*	0.111	4.444	0.049	1.755
51	*Tamirandus indica*	0.022	2.222	0.049	1.065
52	*vitex negunda*	0.044	2.222	0.049	1.087
53	*Ziziphus mauritiana*	4.129	31.111	0.789	19.552
	TOTAL	101.444	368.88	11.018	300

TBA-Total basal area, IVI-Importance value index (IVI=R.D+R.D+R.F)

7. Results

Total area under the 16 sacred groves studied was recorded to be 10.02 ha. The names, local deities associated and other related information is given in Table 1. In some sacred groves trees like *Mangifera indica, Crataeva nurvala, Aegle marmelos, Ficus virens, Ziziphus maurtiana, Ficus religiosa* and *Ficus* benghalensis are considered sacred and worshipped by the people of the respective communities.

7.1 Quantitative Analysis

A total of 54 tree species belonging to 42 genera and 25 families were found in the sacred groves studied (Table 5.2). Fabaceae was the dominant family represented by 10 tree species followed by Moraceae with 6 species. In a similar study conducted by Sukumaran *et al*. (2008) in sacred groves of Kanyakumari district, Tamil Nadu also found Fabaceae as the largest family with 18 species belonging to 14 genera. The observations reveal that Ficus was the dominant genus and predominantly present in all the sacred groves. Gadgil *et al*. (1976) also reported that *Ficus* is the most revered tree of the orient and no species is traditionally felled. Highest density was found to be for *Mangifera indica* (1.678 individuals per ha.) followed by *Ficus benghalensis* (1.184 individuals per ha.). The frequency was found highest for *Ziziphus mauritiana* (31.11%) followed by *Bauhinia variegata* and *Mangifera indica* both having frequency value of 28.889 % each. The results of the study also reveal that *Ficus benghalensis* was the most abundant species in all the sacred groves studied having abundance value of 3.429 followed by *Mangifera indica* with abundance value of 2.615. The total basal area of tree species observed in all the sacred groves was 7.707 m^2. The maximum basal area was observed for *Ficus benghalensis* (20.887 m^2 per ha.) followed by *Ficus religiosa* with basal area of (19.433 m^2 per ha.). The IVI was also found highest for *Mangifera indica* (36.159) with the share of relative frequency, relative density and relative dominance as 7.831, 14.978 and 13.35 respectively. The next highest value of IVI was observed for *Ficus benghalensis* with IVI of 35.379 and relative frequency, relative density and relative dominance of 4.217, 10.573 and 20.59 respectively. In a similar study conducted by Priya and Sharma (2013) in sacred groves of Jammu district of J&K, maximum IVI was found to be of *Ficus religiosa* (47.7).

7.2 Disturbances in Sacred Groves

Out of the 16 sacred groves studied only few *i.e.* Baba Mathwar temple, Chirki Baba temple and Patta Sarovar were found as well protected while most of the groves were subjected to moderate to high anthropogenic pressure in the form of construction activities, urbanization and modernization. The sacred groves of the sites once having sufficient area are facing the threat of urbanization. The study area situated in the suburbs of Jammu city is more prone to urbanisation. More over the other threat to most of the sacred groves is construction activities within the temple premises due to which large number of trees were found to be removed. During the study it was also observed that the sacred sites *i.e.* Baba Kaliveer temple and Baba Sua temple, a large portion of grove have been cleared of vegetation for construction of temple and other accommodation. Anthwal *et al.* (2006) also observed that the sacred groves are disappearing, as the forests are being cleared and utilized for construction and repairing of deity houses in sacred groves of Garhwal Himalayas, Uttarakhand. Extraction of fodder by looping trees and grazing was also found an important threat to sacred groves. Anthwal *et al.* (2006) also found grazing as major threat to sacred groves in Garwal, Uttaranchal. Loss of traditional knowledge and religious belief was also reported from Raja Mandlik sacred grove. People of this area were completely unaware of the value of the place. Two stone crushers were also found near Pata Sarovar sacred groves dust from these stone crushers is a major threat to vegetation of area and also to local population.

8. Conclusion

Many plants and animals have great significance and are considered sacred because of their association with deities. In India conservation of plants and animals by indigenous people is very common. Sacred groves are example of such conservation. The degradation of sacred groves in the form of loss of species and loss of rich cultural heritage of area should be prevented by proper conservation and protection of such areas. People involved in the conservation of sacred groves should be encouraged and incentives should be provided to them.

9. Future Scope

Sacred groves are repositories of rare and endemic species and reserve of unique gene pool. It is clear that, this sacred grove cannot be preserved based only on spiritual belief. The steps must be taken to increase awareness among the visitors, villagers and communities living nearby regarding the importance and relevance of conservation of sacred groves. Thus, sacred grove conservation programmes may be initiated in consultation with the scientists, local people, administrative bodies, NGOs etc. Therefore this study calls for the continued protection of the sacred groves.

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