

Conservation of sacred area through religious belief and impact of anthropogenic activities: A case study from Oran of Deshnoke village, Bikaner District (Rajasthan)

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Abstract

Sacred groves are patches of forest that held sacred through religious belief. This is the area from which local peoples and domestic tribes get food, fodder, fuel and medicinally important plants. The area is conserved by the local person who lives around these areas. Oran of Deshnoke held sacred for the religious belief of Karni Mata by the native people of this area. Various anthropogenic activities degrade the Oran and leads to loss of biodiversity. These activities adversely affect the environment of Oran area. This present case study from Oran of Deshnoke village will reveal that however the large gathering of people in around these sacred groves is a religious aspect but that drastically affect this area which results into loss of biodiversity and many other losses to ecosystem. Present investigation also explores the role of sacred grove in conservation and management of ecosystem services. Various protective measures should have been done to protect this area.

Keywords: Oran, conservation, sacred grove, anthropogenic activity

1. Introduction

India is one among the 12 mega Biodiversity Country in the world, Myers *et al* (2000) ^[1]. Because of enormous demand of growing population, forests are depleted and degraded to fulfill their demands of direct and indirect lifestyle needs. Therefore, it is difficult to manage forests in a sustainable manner. Conservation of natural resources is consequently integral part of the indigenous communities which are found around the forest. The concept of sacred grove is very ancient, it is existed since time of Rig-Veda where worship of tree is quite popular and universal. Rajasthan, which is geographically largest state of India comprises around 1100 Oran's which are spread in area of about 1, 00,000 hectares. It is a state having scarcity of water along with variable environmental conditions. Sacred grove is important component of traditional conservation movement in many parts of world, Hughes and Chandran (1998) ^[2]. They are patches of forest which are protected by local community of that area because of their religious belief. These areas provide many things for human which are economically benefitted like food, fodder, fuel, fruits, timber and nontimber yielding products and medicinally important plants. It is believed that these sacred groves are last refuge of many taxa mostly includes rare, threatened and vulnerable species that need to be conserved, Gadgil and Vartak (1975) ^[3]. Hence these sacred groves are considered to be as epicenter of ecology conservation research, Ray and Ramachandran (2010) ^[4]. 'Oran' is a segment of land that held sacred by local community for the respect of local deity. These sacred palaces are in relationship with indigenous culture in believing that trees are symbol of god and ancestral spirits. Various community set aside these pious areas and established rules and customs to ensure their protection. These rules and customs forbid collection of any material from forest floor, falling of trees and poaching of animals, Malhotra *et al* (2007) ^[5]. The tribal communities which live in surrounding of sacred grove play an important

role in conservation of these sacred grove. These communities conserve these areas because in respect of local deity Naik and Vishnuvardhan (2017) ^[6].

Various anthropogenic activities like deforestation, hunting, overexploitation and development activities around sacred grove directly or indirectly affect the sacred grove. It needs to study the complex interaction between human and environment. If in any environment we found any non-human things than we study that how and in which extent that thing affects the environment in other words we study the intellectual interaction between that non-human things and environment. This interaction is helpful in predicting the human behavior and impact of this behavior on environment, Liu (2001) ^[7]. If this has not been done then a large number of questions remain unresolved like how and which extent the human activities affect the environment? And what novel approach should adopt to answer these questions, Liu (2001) ^[7]. Even the tribal communities which lives in surrounding of sacred grove play an important role in conservation of these sacred grove. These communities conserve these areas because in respect of local deity. A community led environmental initiative will help in raising consciousness among future generation as well as among indigenous community Dutta (2020) ^[8]. In China many protected area (PAs) are established for restoring ecosystem services but increasing development and urbanization negatively affects these PAs. To conserve these area engagements of local community is necessary along with this penalty mechanism for destructive activities should be implemented Zhang *et al* (2017) ^[9]. Various activities including cutting, looping, construction activities have affected the species richness in various sacred grove of Pune District of Maharashtra Kulkarni *et al* (2018) ^[10]. Legal management of juristic personhood may be an effective tactic for conservation of these natural sites Studley and Bleish (2018) ^[11].

Unsustainable human activities are causing environmental degradation which is deteriorating the environmental quality through depletion of resources such as air, water and soil, destruction of ecosystem, habitat loss, extinction of wildlife and pollution. It is also defined as undesirable change in the environment (Bain 2017) ^[12]. These human activities also decline biodiversity. Overpopulated human race along with overconsumption needs is mainly responsible for it. Another major concern of world is that coral reefs are dying out just because of human overpopulation Mabrouk (2007) ^[13]. Global warming is the result of increasing CO₂ concentration in atmosphere which is caused by combustion of fossils energy source such as petroleum coal, natural gases and to large extent by destruction of forest Tan *et al* (2002) ^[14]. Land degradation by human also adversely the value of biophysical environment.

Soil organic carbon concentrations of plants of drylands are very low. Despite of having this afforestation of many of these plants play a significant role in carbon sequestration. The estimated potential of soil organic carbon sequestration by afforestation of plant like Acacia, Mesquite, Neem and others is about 1 Pg C/y for world and 50 Tg C/y for the U.S. R. Lal (2014) ^[15]. There is a positive correlation between species richness and species diversity through tree plantation and sequestration of carbon Singh and Singh (2015) ^[16]. Here in this paper we are concerned about a small but an important patch of sacred grove, named Deshnoke Karni Mata temple, which is situated in north-west Rajasthan, Thar Desert of Bikaner District. It is valuable for local people's doctrine as well as for their lungs oxygen's. Area of this sacred grove held sacred because of respect of Karni Mata. Vegetation of this area is mainly xerophytic. It is a part of world dryland.

2. Material and methodology

- 2.1 Field survey:** - Study of sacred grove had done by field study. Frequent field study has been done, to find out the drastic changes that took place in that area because of various anthropogenic activity.
- 2.2 Interview:** - the field survey conducted by making simple questionnaire format to get information from local people, village headman or old age peoples with their traditional knowledge.
- 2.3 Literature survey:** - various online and offline literature has been used to get the information.
- 2.4 Questionnaire format:** - by simply random survey by asking questions from people that how they utilize the resources to conserve the biodiversity. And their efforts to protect this sacred grove from anthropogenic effects.
- 2.5 Photography:** - photographs of vegetation growing over there and activities of people in sacred area are taken. Identification of faunal diversity also takes place.

3. Observation

Sacred grove of Deshnoke village in Western Rajasthan, is known as natural segment of land that is held sacred by indigenous community on the basis of religious grounds thus play an important role not only with respect to biodiversity conservation but also with food security and climate change. Vegetation mainly found in these Oran is xerophytic because it is part of Thar Desert. A large number of medicinally important plants growing in this area. Oran of Deshnoke village comprises an area of about 2452.66-hectare area. Many plants which are ethnobotanically

important for local communities are growing here. Various rituals and customs related to this pious place established by these local people that are still followed by peoples because of their respect to local deity. During our survey we found that peoples of local community helped maintaining this sacred area.

3.1 Conservation of sacred area

Conservation is the act of preserving the natural resources so they can be used in sustainable way. Many valuable medicinal plants are found in these sacred natural sites, so these sacred groves should be managed to conserve for ethnomedicinally valuable plants. According to conservationist, development is necessary for bright future but only when changes are not harmful to natural resources or environment. By doing survey and field study we found that peoples of local community helped in conservation of the area including its flora and fauna. A large number of plants of "Ber" (*Zizyphus nummularia* and *Zizyphus mauritiana*) are found along with many other xerophytic plants. These plants of ber are held sacred as symbol of "Karni Mata" local goddess of this area. A small temple of goddess is situated in area of Oran. This complete area is held sacred because in respect of this goddess. Cutting of all plants are prohibited in this area. The vegetation is being conserved by local people because various rituals are related to these plants with respect to local deity. People worship the plants of ber that is found in this area. The local people use their traditional knowledge to cure the health of peoples by utilizing these plants so these plants need to be conserved. This knowledge is their wealth and heirloom which is very beneficial to environment. Indigenous man has basic system of medicine to cure the disease to improve the patient condition so that they can live a productive socio-economic life in the society. This traditional knowledge that is used in past by local people is changed into new era medicines by using many advanced techniques.

3.2 Major vegetation of Deshnoke Oran plant species

Acacia nilotica, *Balanites roxburghii*, *Cordia sinensis*, *Prosopis cineraria*, *Tamarix aphylla*, *Acacia jacquemontii*, *Calotropis procera*, *Capparis decidua*, *Ephedra foliata*, *Suaeda fruticosa*, *Zizyphus mauritiana*, *Zizyphus nummularia*, *Aerva javanica*, *Crotalaria burhia*, *Cenchrus biflorus*, *Cenchrus setigerus*, *Cenchrus ciliaris*, *Citrullus colocynthis*, *Convolvulus microphyllus*, *Cynodon dactylon*, *Dactyloctenium scindicum*, *Eragrostis tenella*, *Fagonia schweinfurthii*, *Leptedenia pyrotechnica*, *Ochthochloa compressa*, *Panicum turgidum*, *Panicum antidotale*, *Sorghum helepense*, *Solanum virginianum*, *Tribulus terrestris*,

3.3 A case study from Oran of Deshnoke village: -

A world famous Karni Mata Temple situated in Deshnoke. It is a place where local rats are held sacred. In this village a particular area held sacred for religious belief related to goddess karni mata and this area commonly called as "Oran" by local people of that particular area. The local communities like Bishnois and Charans that lives there to protect this area. A large number of tourists from all over the world visit this temple every year. This Karni Mata temple known as the Rat's Temple. This temple is a popular tourism destination in the Bikaner region. Karni mata also has followers from outside of the state. Karni mata festival

is most popular festival of Rajasthan. This festival is dedicated to divine karni mata. Which held twice in a year during Navratras. The bigger and more significant festival is held for ten days during March-April. The second time it happens between September-October. This festival/Mela held right next to beautiful temple and features various culture and religious programs. A huge number of tourists comes to enjoy and celebrate fair and to get furnished with rich religious tradition of the place. This amazing fair in this astonishing temple is gaining popularity every year. During Navratri's, thousands of devotees visits the temple mainly from Rajasthan and also from Haryana and Madhya Pradesh. These people throughout the garbage, plastics and polybags here and there. In this sacred grove there is no proper waste management during this festival and that leads to immense solid waste pollution in the village and in the area of Oran surrounding the temple, which leads the biomagnification in food chain of this Oran and these anthropogenic activities directly and indirectly affects the vegetation of this area which results the loss of biodiversity of Oran area. Along with this another thing that includes a large gathering in this sacred grove is where a parikrama is being held around the area of Oran on Kartika chaudas. The parikrama is of approximately 36 km long all around the area of Oran. Large number of people took part in this parikrama due to their religious beliefs. Because of that large gathering a large amount of garbage that includes remaining food stuffs, food packets with aluminum foils that creates heavy metal toxicity in soil, plastic bottles, plastics and many more things are throw all over the area of aesthetic periphery in the Oran that are harmful to the vegetation grown over there. There is no proper waste management for maintaining that remains, that results to the damage of environment. The plastic packets get stuck to the roots of plants grown there and damaged their root also cause pollution. Proper control measures should have taken place to prevent the damage of environment.

3.4 Major challenges and threats

The sacred area providing many valuable things like food, fodder, fruits, fuel, medicinal plants and shelter home for various kind of animals, in return of these valuable things, Oran areas are conserved by local peoples. We can say there is a mutual interaction between these areas and human kind. In spite of conservation and maintained by human being, it faces various threats, that leads to loss of its biodiversity. Even various anthropogenic activity drastically affects the area. These anthropogenic activities include overgrazing and establishment of chemical factory near sacred site and uncontrolled cutting of valuable trees for the source of fuel. This overexploitation and pollution from factories result in disappearance of species before they noticed or their scientific value discovered. These anthropogenic activities disturbed the equilibrium of interrelationship that exists between communities and environment and that adversely affect environment. Some important impact of human activities on environment which lead to environment decay are deforestation, industrialization, loss of ecological balance, water pollution, air pollution, increased consumption of natural resources, production of waste, extinction of wildlife, agriculture runoff, urban development etc. These all impacts lead to environment degradation. Another major challenge for the Oran of this village is the large gathering of people during Navratri's. These people

throw their garbage all around the Oran area, as there is no proper waste management that becomes the major cause of pollution to the environment. All these things severely affect the vegetation growing there. Local people also throw their domestic waste in this area that ultimately leads to destruction of environment.

3 Discussion

Deshnoke sacred grove is situated in western part of Rajasthan. The western Rajasthan Especially Bikaner district is backward in the field of all scientific research just due to ignorance and possibly harsh climate and low population density. A handful literature is available for habitat ecology and biodiversity conservation. Over exploitation, habitat loss and lack of scientific knowledge are the major threats for losing species in sacred grove of study area. If it is continuously neglected some more species may become endangered. This work proposes to generate all information about study and prevention of urbanization and human encroachment effect on the plants of sacred grove. Present study will provide a strong scientific platform for the conservation of sacred grove with threatened and medicinal plants with minimal human perturbation effect on natural habitat. Afforestation of plants in this dryland leads to sequestration of carbon that ultimately increases the soil organic carbon. But due to these anthropogenic activities and various environmental factor the area and environment of Oran gradually degraded and biodiversity is diminished. That's why effort should have been made to conserve and protect this area. Sacred grove is house of various important medicinal plant which is utilize by indigenous people of that area for treatment of various disease. This is another main reason that we should take necessary action to protect this area. State government along with various ethnic society should support their identity and make contribution to sustainable improvement of faunal and floral diversity. Sacred grove in real face a number of challenges because of these anthropogenic activities and environmental issues, as greater sensitivity towards their conservation is necessary. Despite of being have community-based conservation the value of the sacred site is ignored by conservation practitioner. Lack of recognition of sacred site is partly due to lack of understanding among conservationist or partly because of secrecy that is maintained by people of local community because of their traditional custodians. It is therefore important that conservationist must include the safeguarding of these site in their priority list.

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Fig 1: Area of Oran Showing Karni Mata temple



Fig 2: Gathering of people in sacred grove area during Navratri



Fig 3, 4: Pictures showing human perturbation activities in sacred grove area



Fig 5, 6: Pictures showing grazing of cattle in study area



Fig 7: Chemical factory present in study area

5. References

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