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Biodiversity, Threat & Conservation Of Sacred Groves - A Case Study Of Sonazar- Rupazar Sacred Grove In Valsad District, Gujarat, India.

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Abstract:
The eminent catastrophe for natural resources and diversity is a universal calamity. Natural resources and diversities are steadily disappearing and crumbling at quite an alarming proportion. As a result, this forest cover is divided into small patches of vegetation, a few of them anyhow conserved as Sacred Groves (SGs) due to religious beliefs, myths, and traditions held by indigenous people. However, deforestation and over-exploitation put SGs in a terrible situation. This paper deals with a case study of Biodiversity, Threats & conservation of Sacred Grove in Dharampur taluka from Valsad district, Gujarat, India, carried out through informal discussions and interviews with villagers, priests and sarpanch of the villages. The data consolidate the development of SG, tourism activity, business activity, and economic status, awareness of environmental conservation, natural resources, biodiversity and the current status of the SG. Results show that Villagers are dependent on SG for day-to-day needs and the rate of deforestation is very high due to anthropogenic activities in SG. The community's changing attitude towards spiritualism, destruction of traditional values and lack of awareness put sacred groves in danger. Protection of SGs is not possible without the effective involvement of locals. It is necessary to bring awareness to locals and give them valuable education especially the younger generation, to help in changing attitudes toward materialism to spiritualism, so that conservation goals can be achieved.

Keywords: Sacred grove; Natural resources; Biodiversity; Exploitation; conservation.

1. INTRODUCTION

Protection of natural resources is the sensible use of resources by the people. Religious and traditional values have protected our forest diversity for many decades [14]. One of the significant traditional values is to protect those tracts of forest which have been devoted to a god or goddess as a sacred grove. Sacred groves are a group of trees or patches of natural forest of pre-Vedic origin, it is a belief that meanwhile shifting cultivation, patches of natural vegetation or tract of forest are left untouched, these patches or forest tracts might have evolved as sacred groves [2]. Indigenous communities conserve sacred groves for several generations through their religious beliefs, myths and taboos associated with them [15]. SG attributes certain patches of vegetation, and great asylum for endemic diversity to the name of the associated deity these arrangements might have been systemized over time by the tribal community through associating sacred value to it, to form collective management easy and long-lasting. Ancestors of these communities were knowledgeable and aware of the importance of natural resources and the need for their protection for the subsistence of the forthcoming generation [15]. The significance of SGs has been interpreted from many aspects as they refuge for rare and endemic flora and fauna, depositories of medicinal plants and are recognized as the residue of the original forest, guarded by the tribal people due to faith that deities reside in this forest [16]. Trees are worshiped as sacred trees by religious people, as they are either edible or have medicinal properties. It not only conserves flora and fauna consisting within them but also contributes to water and soil conservation [11]. Modern people's changing attitude toward spiritualism and their needs & greed's outcome turn in to weakening of

traditional and religious values and these virgin tracts of forest are on the road to extinction [9]. Expeditious rising in human population, varied types of pollution, over-exploitation of natural resources, erosion in religious and traditional values and lack of awareness are the primary reasons, responsible for the degradation of Sacred groves [8]. In this case study, we analyzed the utilization of natural resources, biodiversity, conservation, tourism, business activity and present status of the sacred grove through the following procedure.

2. MATERIAL & METHOD

2.1 Study Area

The present paper interpreted a case study of the sacred grove from Dharampur taluka in Valsad district, Gujarat. The study was executed in Sonazar-Rupazar sacred groves at Chichozar village in Dharampur taluka. It lies between 20°30' 10" North latitude and 73°13' 51" East longitude. Associated deity is known as Sonazar and Rupazar Mavli. There are two water springs known as Sonazar and Rupazar which flows from below the ground through the root of the *Ficus amplissima* (payar) throughout the year. This tree is considered a sacred tree and abode of the goddess. This SG extends over 1 hector of the area and falls under the forest department. It has patches of natural vegetation and landscape; it is a good spiritual place. Many rituals are performed in this grove at the time of Diwali, vaghbaras, holi and Navratri festival. The location map and view of the study area is given in Figure 1.

2.2 The case study

The case study was conducted to explore the utilization of natural resources, the current status of the grove, conservation practices, threats and factors responsible for the degradation of Sonazar-Rupazar sacred groves and to promote ecotourism activity in Dharampur taluka. The preliminary data was collected by using qualitative phenomenological analysis. The study was conducted by using questionnaires and informal interview methods. Face-to-face interviews were done with the villagers, priest (bhagats) of the sacred grove, governmental agencies and sarpanch. Data collection was done based on the inputs of the above-mentioned people.

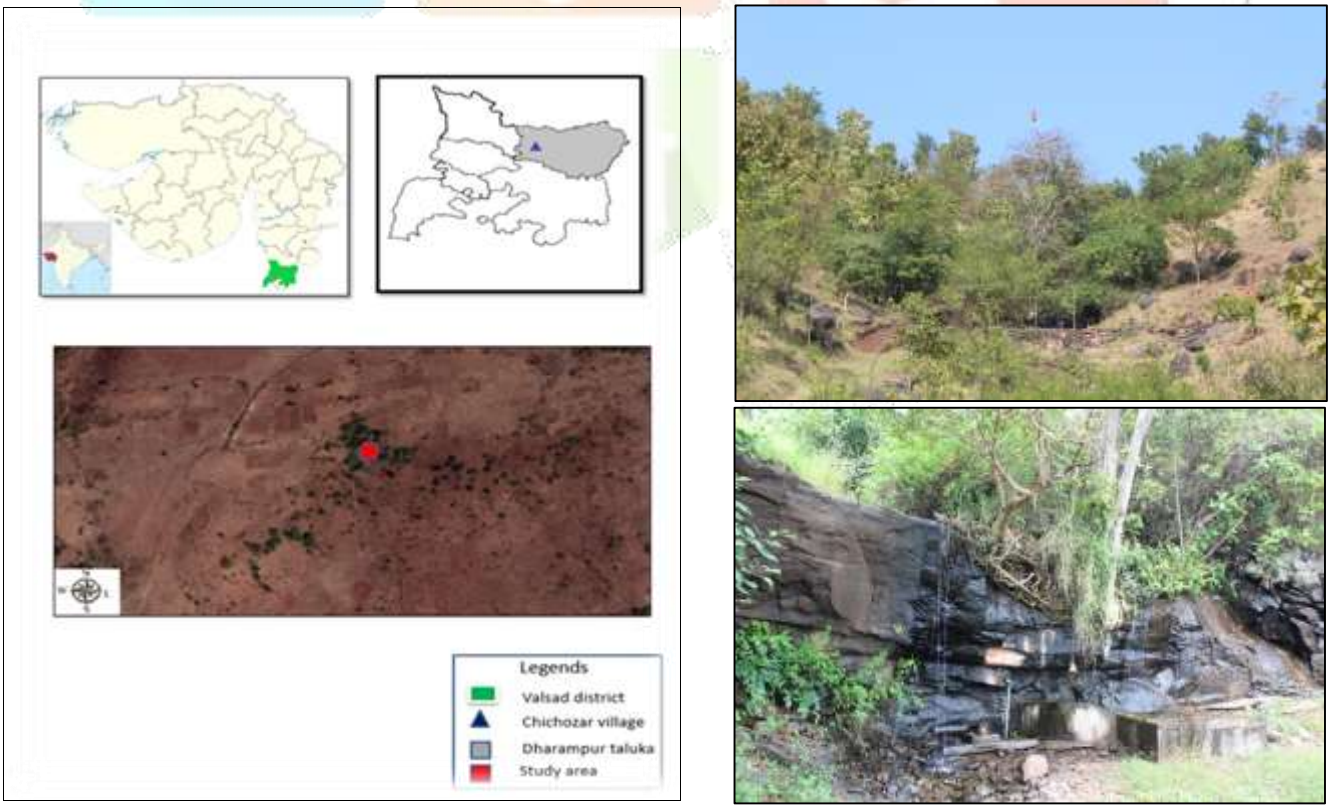

Figure-1 map and view of the study area.

2.3 The interview procedure

Biodiversity, conservation and threat analysis of Sonazar- Rupazar sacred grove was done to derive a strategic proposal for future ecotourism development. For this, an interview of 38 families from the village was done, who were directly or indirectly associated with the sacred grove. Each interviewee was from a different occupation, *viz.* Sarpanch, priest, local vendors, and farmer. Each interviewee from a different family was referred to as I1, I2, I3 and so on according to Table 1. A questionnaire was designed based on general themes like knowledge of environmental policies, business activities, conservational activities, tourism, tourism impacts, developmental work, utilization of natural resources, decapitation of forest area, social and economic impacts and development of the area through tourism and current status of the grove. The qualitative data obtained were analyzed by using qualitative phenomenological analysis.

3. RESULT & DISCUSSION

Demographic Data

Demographic data were derived from the qualitative interviews taken from the sacred grove of Chichozar village in the Valsad district. The interviewee population age ranged from 18-70 years to analyze the contribution of both the generations young and older in the development and conservation of the grove area. The low education qualification of villagers could be one of the hurdles in the conservation of groves diversity. It is noticed that most of the families are poor who lived in and around the sacred grove. Earning population average income is divided into two strata – lower average income goes up to 15,000 rupees and higher average income goes up to 300000 rupees. Maneuvering the local language can minimize the efforts in the propaganda of environmental schemes, and conservation of biodiversity which would have a large impact on the sacred grove's environment.

Table-1: Demographic table. (I-Interviewee)

Themes	Age	Education	Occupation	Cast	Family value	Annual Income	Addiction
I1	42	M.A	Sarpanch	Ganvit	Nuclear	60,000	No
I2	40	10	Priest, farmer	Baria	Joint	17,000	smoking
I3	50	-	Priest, farmer	Baria	Nuclear	18,000	drinking
I4	45	2	Farmer	Bhoya	Nuclear	20,000	No
I5	70	-	Farmer	Baria	Joint	25,000	Smoking
I6	46	4	Farmer	Baria	Nuclear	20,000	No
I7	56	10	Farmer	Baria	Nuclear	20,000	No
I8	67	-	Farmer	Gayakwad	Nuclear	25,000	No
I9	62	2	Farmer	Gayakwad	Joint	18,000	Smoking
I10	60	-	Farmer	Ganvit	Joint	18,000	Smoking

Study of Threat, conservation & Biodiversity of Scared grove - a case study of Sonazar-Rupazar SG from Dharampur Tehsil by using qualitative phenomenological analysis and data analysis has been done which is given in Figure: 2.

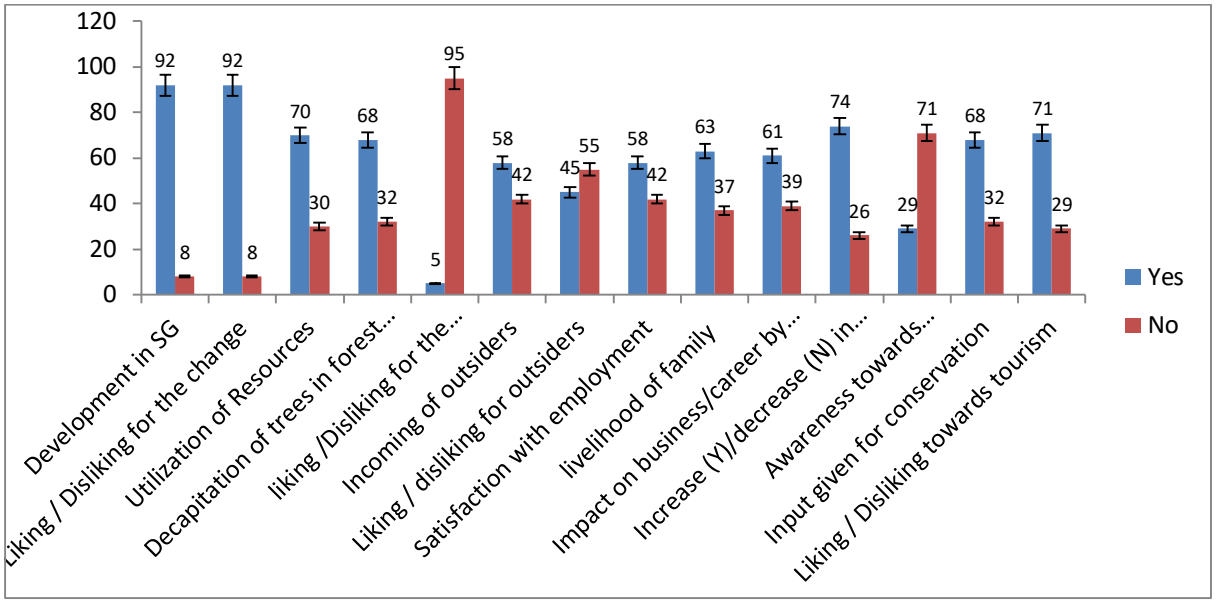

Figure: 2. extraction of qualitative data on different themes based on utilization pattern of natural resources and its impact on the sacred grove.

3.1 Developmental activities in SG

According to figure-2 based on interviews taken, 92% of interviewees stated that the grove area has been changed from the past. Developmental work like road construction, water tank construction and electricity arrangements have been done in this area, which did not exist in the former time. Groves are the source of water resources that have been conserved through local's belief that a deity resides in groves yields water for them [1]. A water tank is constructed, adjoining water springs that provide water to the villager through pipelines from the grove area. On the other hand, 8% did not give a clear answer about it and stats more developmental activities destructs the sanctity of the grove. 92% of interviewees are satisfied with developmental activities in this region. On the other side, 8% of interviewees said that more development should be needed in this area. As it has a good landscape and good spiritual place, it will become a great ecotourism place. If that area will be developed well so it will prove to be beneficial for the villagers, they will get an opportunity for employment and the village condition will improve.

3.2 Natural resources

Sacred groves provide various kinds of facilities like soil, medicinal plants, none timber products and water sources [9]. The Sonazar-Rupazar sacred grove is located along the perennial water spring leading to a water tank that supplies water to the village. Results show that 40% of villagers get water throughout the year from SG. They utilized water for different purposes like drinking, irrigation, etc. 30% of the water is used for agricultural purposes (Fig.3). According to a study, 50% of water is utilized for household consumption. 20% water for miscellaneous work like washing car or bike, cleaning the courtyard of the house, for cattle, etc. SGs are repositories of natural resources. Resources that are traditionally collected from sacred groves consist of fuel wood, fruits, seeds, ethnomedicinal plants, fodder for cattle, soil, and perennial water sources [11]. SGs are an important source of soil and water conservation which is useful for the residents in terms of preventing soil erosion and water supply in the dry season [1].

Sacred groves are an ecosystem in itself which not only conserves soil and water but also generates an essential nutrient that goes into the adjoining agro ecosystem [11]. As the land of the sacred grove is more fertile and good for farming, villagers used this land for agricultural purposes. 1 acre of land is occupied for farming as a paddy field by villagers (Fig.4). 0.65 acres of land is utilized for religious activities. Due to these activities, 0.85 acres of land conserved which is located around the goddess of the SG. Tropical plant species are extinct due to the conversion of forest area into agricultural land [16].

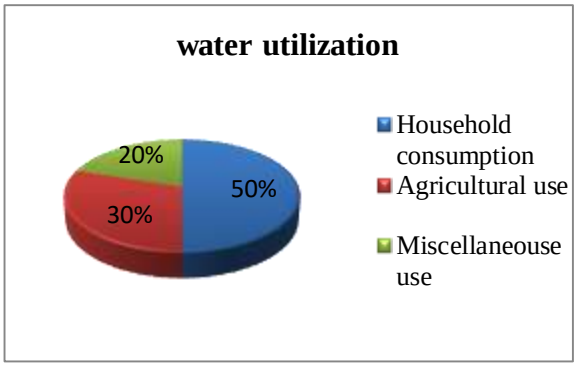

Fig.3 Water consumption from SG

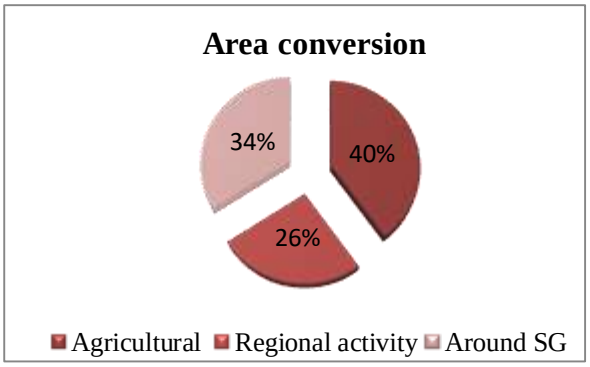

Fig.4 Utilization of land in SG

3.3 Biodiversity of Sonazar-Rupazar SG

Sonazar-Rupazar SG harbors rich biodiversity. A total of 32 plant species is recorded from the area, it representing 30 genera belonging to 19 families (Table-2). Among total species, 6 species of herbs, 4 shrubs, 7 climbers and 15 tree species. Malvaceae and Rubiaceae are dominant families having 4 species each followed by Fabaceae with three species. 90% of plant species are utilized as etheno medicine by bhagat (local traditional healer) and villagers. Sacred groves harbor many endemic species of flora and fauna. It is providing a great example of in-situ conservation for threatened species, which disappear from the surrounding area [17].

Table: 2 List of plant species recorded from the sacred grove.

Plant name	Family	Habit
Aegle marmelos (L.) Corrêa	Rutaceae	Tree
Anacardium occidentale L.	Anacardiaceae	Tree
Abelmoschus moschatus Medik.	Malvaceae	Herb
Abrus precatorius L.	Fabaceae	Climber
Aeschynomene americana L.	Fabaceae	Herb
Ampelocissus latifolia (Roxb.) Planch.	Vitaceae	Climber
Anisomeles heyneana Benth.	Lamiaceae	Herb
Argyreia nervosa (Burm. f.) Bojer	Convolvulaceae	Climber
Azadirachta indica A. Juss.	Meliaceae	Tree
Azanza lampas (Cav.) Alef.	Malvaceae	Herb
Bixa orellana L.	Bixaceae	Shrub
Boerhavia diffusa L.	Nyctaginaceae	Herb
Bombax ceiba	Malvaceae	Tree
Cayratia trifolia	Vitaceae	Climber
Dendrocalamus strictus (Roxb.) Nees	Poaceae	Tree
Diplocyclos palmatus (L.) C. Jeffrey	Cucurbitaceae	Climber
Dregea volubilis (L.f.) Benth. ex Hook. f.	Apocynaceae	Climber
Ficus amplissima Sm.	Moraceae	Tree
Ficus racemosa L.	Moraceae	Tree
Haldina cordifolia (Roxb.) Ridsdale	Rubiaceae	Tree
Holarrhena antidysenterica	Apocynaceae	Shrub
Hymenodictyon orixense (Roxb.) Mabb.	Rubiaceae	Tree
Mangifera indica	Anacardiaceae	Tree
Mitragyna parvifolia (Roxb.) Korth.	Rubiaceae	Tree
Neolamarckia cadamba (Roxb.) Bosser	Rubiaceae	Tree
Neuracanthus sphaerostachys Dalzell	Acanthaceae	Herb
Phyllanthus reticulatus Poir	Euphorbiaceae	Shrub
Plumbago zeylanica L.	Plumbaginaceae	Shrub
Sterculia urens Roxb.	Malvaceae	Tree

Tectona grandis L. f.	Lamiaceae	Tree
Terminalia arjuna	Combretaceae	Tree
Vigna vexillata (L.) A. Rich.	Fabaceae	Climber

Natural resources are traditionally harvested from groves including fruits, flowers, seeds, fodder and ethno medicinal plants [1]. Local people of the area harvest the plants from the grove area after taking permission from the priest (Bhagat) of the grove after he consulted with the deity or goddess of the sacred grove. These plants were used in the treatment of various kinds of diseases like cough, dysentery, cold, fever, mouth disease, scorpion bite, and jaundice, and some herbs were used as decoction during the corona pandemic by villagers.

3.4 Status of forest area in SG

68% of interviewees agree with the decapitation of the forest area. 32% refused to agree with this statement. SGs are an eminent medium for the conservation of forest diversity, conservation of soil, and perennial water sources [2]. 95% of interviewees agreed that decapitation of the forest cover will not allow in these SGs while 5% of interviewees are in favor of developmental activities. They stated that if some trees were cute for the development of this area is not a big deal. The study reviled that the degradation rate of the forest area is very high in this region. According to villagers in the past forest cover was spread over in 1 hector of the area of the grove, now only 34% of the forest area is conserved which is dedicated to the deity of the grove. Anthropogenic activities not only affect the species composition but also disturb the ecosystem retain by the sacred grove [11]. A result shows that 66% of forest area is lost due to human encroachment; it is a huge biodiversity loss in this region. Excessive consumption of natural resources (e.g. water, plants, and soil) and cattle grazing in these regions has to produce anthropogenic pressure on valuable species of the grove [17]. Various developmental activities, firewood collection and agricultural activities put SG in a horrible situation. For religious activities, water tank construction and road construction some forest cover is cleared which causes degradation of the forest area. Excessive grazing also damages the plant diversity of the area. Various developmental projects in grove areas are also one of the reasons for encroachment in sacred groves areas, as well as migration-immigration of people has a major role in the extinction of sacred groves [15]. This region needs proper management and conservation as was conserved in past. To manage and protect the grove's natural environment and sanctity, it is essential to involve locals and taken them into confidence.

3.5 Conservational activities

29% of interviewees are aware of environmental conservation, the importance of conservation of natural resources and help to make people aware of conservation. 71% are unaware of conservation laws due to illiteracy. SGs are the worthwhile depositories of rare and endemic flora and fauna. Sacred groves are a notable example of community conservation [11]. Traditional values and religious beliefs played a vital role in the conservation of SGs [3]. Despite higher illiteracy, 68% are involved in conservational activities. They are involved in the conservation of water and did plantations in grove areas. 32% are not involved in these activities. It is noticed that in the past local rules and regulations, rule the conservation of natural resources. These rules and regulations incorporate myths, religious beliefs, taboos and superstitions. It has not legally ruled but this was enough for local people to obey the rules and regulations [14]. It controls the continuous use of resources. Developmental activities, resettling of human habitat and modernization are the responsible factor for the deterioration of the sacred groves, it needs proper management and conservation practices as was done in earlier times [15]. National afforestation & eco-development activities are helpful to bring awareness to the local tribal community towards the conservation of the area [17]. Thus, it becomes necessary for the government to legislate and make people educated about the importance and significance of the conservation of biodiversity. According to the study, the main task of management in the sacred grove is the priest (Bhagat) and the community of the village. Customarily priest is the head of the community and he can set boundaries, and limitations and control the harvesting of resources from the grove area.

3.6 Religious beliefs & myths of SG

Myths and taboos are directly or indirectly related to the conservation of SGs. Religious beliefs and myths work as a medium of conservation for threatened species of flora and fauna of the grove [15]. It is unwritten and orally hand on from one generation to the next. In the rural or tribal areas many trees, animals, rivers, ponds, and even whole forest areas are believed to be sacred in the name of the god or goddess and as consequence they are conserved and no cutting and hunting or no exploitation are carried out [4]. Due to this consecration economically and medicinally important plant species and animals are preserved and help as a genetic reservoir for threatening or extinction of species. Thus, traditional and religious beliefs act as a

protective shield for rare and threatened flora and fauna and also help in the conservation of natural resources and prevent exploitations [6]. The (‘Bhagat') head men of the SG look after the usage and protection of the SG to assure that there is no inaccuracy from the community-appointed rules. Religious people feel good by performing a traditional and regional ritual at the grove and feeling blessed by the goddess. There are two water streams, which are believed to be blessings of the goddess that streams flow throughout the year. Villagers believe that water is sacred and sprinkle it in their homes on the occasion of Dhanteras for the sanctification of the house. It is faith that by performing these rituals happiness and prosperity will come into their home.

3.7 Rituals & Festivals in SG

Several traditional rituals and festivals are associated with SGs. The celebration of festivals, organization of fairs, and rituals performed by tribal people in SG have sustained traditional values and socio-cultural heritage. Several plant species are connected with festivals and used in traditional rituals viz. Bili (*Aegle marmelos*) in Mahashivratri festival [15]. In Sonazar- Rupazar SG festivals are celebrated during March and October. Religious people played Garba during the Navratri festival and worshipped the goddess Sonazar –Rupazar. On the occasion of Holi, villagers prayed for a good crop and good health and wealth in the village. During the Diwali festival, many rituals are performed there and villagers worshipped and thank the goddess for providing them with water throughout the year and reaffirm their commitment to the forest and the goddess. Headmen (Bhagat) of the grove ensure that no divergence takes place in the grove's rules during festivals.

3.8 Economic status, Tourism & Business activity in SG

Tourism brings a lot of economic gain by creating new jobs and/or businesses for residents. Infrastructure development in SG has created drastic changes in the area and the population's living standards. Poor people most benefited from an increase in tourism; therefore, the government should focus on this sector in this area to expand tourism and transform it into eco-tourism. 63% are fine with their earnings for their family's livelihood. It offers economic stability for villagers and brings secondary revenue which has improved their living style in them [12]. 37% are goes in search of another option for their livelihood. 61% agreed that business is raised through tourism or development in SGs. Small-scaled business has been encouraged like tea stall, toys shop, flower shops, juice center, grocery shop, hotels and restaurants, etc. Local poor people made Ghumti's (small stalls) where they sell pilgrimage goods. Also, the local craftsman is encouraged to show their skill-based products and could sell them by generating the value of it. Thus, it could be the main source of revenue generation through the opening of local handicraft shops and souvenirs shops [10]. 39% of interviewees are not able to give a clear answer about that. As they are less connected with SG or goes there once a year for religious purpose only. During monsoon and festival season local business activities grow as tourist numbers increased. 74% are stats that their income graph was raised through tourism activities and they can educate their children while 26% are not seen as a value-creating business, as this activity provides seasonal profits. 58% accept that outsider people come to this area for employment or for earning. 42% of people stats that they are hawkers and only come here for their livelihood. 45% of locals are accepting that while 55% are not happy with the intruding of an outsider.

3.9 Current status and threats on SG

SGs are a magnificent example of the conservation of biodiversity. As we discussed above SG is a great refuge for native flora and fauna, as religious beliefs, myths, and many taboos are associated with SG, and it protects for many decades. But as time changes people’s altitude is changed from spiritualism to materialism it causing to erosion of traditional values and religious beliefs which results in the degradation of SGs [8]. According to the case study, it seems that rapid cultural changes among the younger generation are one of the reasons for the degradation of sacred groves, as they did not believe in their forefather's conservation methods for groves. It shows cultural erosion between two generations. An increase in population and increasing demands, industrialization, pollution, and developmental activities cause damage to the SGs [1]. The major noticeable human impact is a reduction in forest cover in the area. Developmental activities like road construction and water tank construction cause great damage to the diversity, around 40% of the area is used for agricultural purposes and 26% of the area is used for religious activities. As a result of human impact, 66 % of the forest area is exploited and it causes major biodiversity loss in the SG. A major factor that is responsible for the degradation of the sacred grove is urbanization, the need for road facilities, house construction and other infrastructure developments that have been encroaching on the area of the sacred grove [7]. Local inhabitants with the help of governmental institutes or forest departments can conserve this region. Initiatives like a strict prohibition on manure collection, restriction on cutting & grazing, prohibition on construction work, etc. can

be taken as a preventive measure for the degradation of SG. It all depends on awareness and control of the tribal community of this area [13]. Thus, active participation of local tribes is essential for the conservation of SG.

In several parts of the country, sacred groves are great illustrations of the residue of climax vegetation which are vanished due to modernization [7]. There was dense forest covering the whole sacred grove in the past which is not existing in recent times. Villagers cut down the trees for firewood, ethnomedicine, fodder, and various constructional works. Even grazing is not prohibited in this area it causes great damage to the native plant species. Due to over-exploitation of natural resources like soil, water, and plant and due to human encroachment, it is essential to do restoration activities like replantation, conservation of native species for seedlings, nursery development for rare and endemic species in this area [5]. Increasing developmental activities, excessive tourism activities, urbanization, and various kinds of anthropogenic activities have threatened the sacred grove [8]. Thus, government needs to pay more attention to this region.

4. CONCLUSION

Today we live in materialistic civilizations which retard the development and evolution of human values. Even though alarm on catastrophe for biodiversity annihilation and extinction of natural resources and its concurrent impact on socio-cultural diversity, SGs have proven as a significant natural repository and play a vital role in sustaining the link among nature, people, and their ancestor's religious beliefs, and God. The study finds that changing attitudes of people toward spiritualism and over-exploitation of natural resources cause the degradation of SGs. Thus, it concludes that improvement in the exploitation of SGs is not possible without the effective involvement of local people. Thus, taking them into confidence and making people aware of conservation and giving them valuable education especially the younger generation, to help in changing attitude toward materialism to spiritualism and tourism should be transformed in to ecotourism, so that the conservation goal of SGs can be achieved.

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