REVIEW OF LITERATURE
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India has always been noted for its rich spiritual tradition. This is symbolized by a symbiotic relationship between the biophysical ecosystem and socio-economic institutions. There is also a strong link between culture and environment. Some myths and religious customs that abound in this country help to protect plants and animals, forests, rivers and mountains so far. One such example is that of the sacred groves. A sacred grove may be defined as an undisturbed patch of vegetation or a thickly forested patch found around the deities on the outskirts of villages. These groves are often dedicated to local folk deities or ancestral spirits. The groves have been well protected centuries together due to various religious and social traditions that impose harsh punishment on those who violate the groves.

The deities are worshipped on every auspicious day by the local people and also offered pooja during these occasions. In many locations sacred groves are the last remnants of the native vegetation. Several villages are still preserving these numerous native species of plants, animals, insects and micro-organisms. This indicates the efforts made by local communities to protect and preserve their natural forest tracts, against the onslaught of the clearing of forests for cultivation and settlements. The taboos and belief system prevailing in the local area have contributed a lot for the preservation to the sacred groves. Due to cultural diffusion by rapid urbanization, sacred groves are gradually disappearing in many areas. Sacred groves are found not only all over India, but also across in various parts of the globe.

Sacred Groves: The International Scenario

Sacred Groves are the remnant forest patches preserved in the name of tradition or culture as observed in various societies across the world. Sacred groves are reported from Asia, Africa, Europe, Latin America and Australia. However, their present occurrence is mostly restricted to Africa and Asia. Report of Man and Biosphere (1995) has described the presence of sacred groves in Ghana, Senegal and Sumatra. In India, sacred groves are well documented from the North-east Himalayan region, the Western Ghats, Eastern Ghats, the coastal region; the Central Indian Plateau and Western desert (Malhotra et al., 2001). A diverse range of ecosystem is preserved in the form of sacred grove conservation tradition along with its regional and local identities as represented in name, practices and management of the groves.
The ancient Greeks represented the spirit of conservation in the shape of a terrible protector of animals and plants, the goddess Artemis. She was not only the protector of wildlife but for the wilderness too. In ancient religious thought, Artemis endowed the wilderness with sacredness (Hughes, 1990).

Sacred groves are reported from Africa since pre-agricultural, hunting and gathering societies originated in Africa. Areas associated with cultural rituals such as rain-making, sacrifice to totems, earth spirits and burial grounds are considered as sacred groves. Frazer (1935), in his book, the Golden Bough, mentioned about the migumu tree in the groves and its sacredness among the Kikuyu tribe of Africa. Cutting of trees or breaking the branches or collection for firewood, burning of grass, grazing and hunting of wild animals living within the groves are strictly prohibited. According to Brokensha & Castro (1988), there are about 200 sacred groves found in the Kirinyaga district of Kenya that are protected by the Kikuyu tribes. These groves vary in size from one-tenth of a hectare to 1.3 hectares. The colonial administration listed over 100 sacred groves ranging from one-fourth of a hectare to three hectares, where cutting of trees was taboo among the Mbeere tribe of Eastern Africa (Little & Brokensha, 1987).

Ethiopia is the second largest populated nation in eastern Africa and their religious belief system played a vital role in the conservation of biodiversity. Sacred groves and forests still survive throughout Ethiopia and Orthodox Christians and Muslims and local ethnic groups who follow their own traditional belief systems to protect these sacred groves. Oromo, an ethnic group with their own traditions, begin the harvesting season with a prayer ceremony, i.e. a thanks giving festival called irreessa which takes place under big trees. The Gurage and Amhara also have their own traditional belief system called adbar which takes place each year under big trees located on community lands (Aerts, 2007).

Sacred groves occur throughout Ghana, with a range of several hectares to a few trees. In northern Ghana, patches of woody vegetation are conserved by communities for ritual purposes. In north eastern Ghana, about 179 groves were reported (Roger Blench, 2004).
The sacred groves and their communal features are responsible for the cultural estrangements of the Tiriki people, similar to those of India and Ghana (Kassilly & Tsingalia, 2009). In Kenya, the sacred groves are known as *Kaya* forests (Githiro, 1998).

Timor in Southeast Asia is intimately associated with the ritual expressions of pre-Catholic indigenous religions of the island. According to Gunn (1999), the *dato-lulic* or *railulic*, community priest, mediated with the spiritual world manifest in such natural phenomena as rivers, mountains, forests and gardens. Concepts of *lulic* (sacred) permeated traditional social life, from the ritual management of agriculture and the monsoon rains, to life cycle ceremonies and the conduct of warfare. Across the island, the rock and tree form remain highly charged symbolic cultural structures. In West Timor, among the Meto speaking communities, a short-hand description for their indigenous religion is the ‘sacred tree and the sacred rock’ (*haule'ufautle'u*). The widespread occurrences of sacred groves are also found across the *Fatuluku* speaking communities of Lautem District in far Eastern and East Timor. Here the notion of the sacred forest (*latate'ior latairin*) is closely tied to the mythic origin places of local clan groups, appearing in forest groves or forested islands in savanna grasslands and heavily cultivated garden lands. Comparative examples of these indigenous perspectives from West Timor are the extensive ‘sacred’ forests found in the Mutis mountain region of the central west (McWilliam, 2001).

Sarmatia extended from the north of the Caspian Sea to the mouth of the Vistula in the Baltic. Procoupius states that in his days, “…the barbarians worshipped the forests and groves and in their barbarous simplicity placed trees among their gods”.

The people of Judea venerated natural groves. Although worship was offered to Baal and other foreign gods, they worshipped groves or *asherah* frequently. The *asherah* is often represented as an emblem on Assyrian sculptures, and is an artificial tree (Lord Aberdeen). It seems that the worship of the *asherah* or groves was an essential form of tree worship, but this may be a local form of worship, entirely opposed to the Jewish religion.
The ancient Germans believed that they were the offspring of their sacred trees and forests. They had no images and declined to enclose their gods within walls, but consecrated groves and woods in the name of their god. The Christmas tree, so common to the whole of Germany, is a remnant of the tree worship of their ancestors.

A part of Scandinavia named Uppsala existed in front of a great temple. “There grew a huge tree of unknown origin, that spread with large boughs, and was green both during summer and winter”, and near the same temple was a sacred grove, every tree and leaf of which was considered to be the most sacred thing in the world.

Sacred Groves: The Indian Scenario

In literature, the antiquity of the groves could be traced to the Buddhist period. Patches of vegetation were preserved as Amara vana, Venuvana, Salaivana, Ashokavana, Kadambavana, Vilvavana etc. and were named after the dominant / characteristic species (Somashekar, 1998).

In India, groves are well documented from the North-east Himalayan region, Western Ghats, Eastern Ghats, coastal region, Central Indian Plateau and Western desert. A diverse range of ecosystems is preserved in the form of the sacred grove conservation tradition, along with its regional and local identities as represented in name, practices and management. Sacred groves probably date back to Palaeolithic times, to pre-agriculture, hunting and gathering societies that lived in forests. In our times, an undisturbed patch of vegetation left in the outskirts of the villages in the plain or a part of forested area dedicated to the local folk deities or ancestral spirits that are protected by the local people through social traditions and taboos incorporating spiritual and ecological values are called sacred groves.

Sacred groves may be distinguished from the worship of certain ‘keystone’ plant and animal species that are both ecologically and socially significant. Sacred groves are protected by local communities through taboos and sanctions that have cultural and ecological implications. The forests are the property of the gods of the villages in which they are situated and the trees ought not to be cut without the approval Gauda or headman of the village whose office is hereditary and who is also the priest (pujari) of the temple of the village deity.
In India, Gadgil & Vartak (1975) are the pioneers of scientific study in this field. They have studied the floristic and ethnobotanical aspects of the sacred groves of Maharashtra and North Kanara. Religiously safeguarded forests within each village exist even today in some of the remote corners of the country (Gadgil & Vartak, 1981; Vartak & Gadgil, 1981; Vartak et al., 1987).

Wherever sacred groves have existed in India, indigenous traditional societies have spiritual relationships with the physical environment that sustained them. All forms of vegetation in the sacred groves are supposed to be under the protection of the reigning deity of that grove, and the removal of even a small twig is taboo. It is believed that sacred virgin forests originated date back to several thousands of years when human society was in a primitive state. The historical link of the sacred groves can be traced to the pre-agricultural, hunting and gathering societies (Gadgil & Vartak, 1973).

The sacred groves are the home of the local flora and fauna and represent a mini-biosphere reserve, making them an essential part of the conservation process. Due to local belief systems, human interference in the sacred groves has been restricted, and thereby, there is a reduction of, harvesting natural resources. The consequence of such restriction has been that sacred groves have evolved as the important reservoirs of biological diversity. Many sacred groves constitute pristine vegetation and are particularly rich in climax vegetation with associate groups of unique fauna. A number of studies have emphasized that many sacred groves are climax forests and probably are the only remnant of near-natural vegetation in many parts of India. Such islands of climax vegetation amidst a degraded landscape can be seen in many parts of India.

Sacred groves serve as a seed source (through dispersal by birds) through which ecological restoration can be achieved. For example, the sacred groves of Manipur contain ecologically valuable species like *Albizia lebbeck* and *Ficus glomerata* which conserve a high amount of minerals in their leaves.

A diverse range of ecosystem is preserved in grove tradition along with its regional and local identities as represented in name, practices and management of groves. There are 13,270 sacred groves found to be intact (Andhra Pradesh 750, Arunachal Pradesh 58, Assam 40, Chhattisgarh 600, Gujarat 29, Haryana 248,
Himachal Pradesh 5000, Jharkhand 21, Karnataka 1424, Kerala 2000, Maharashtra 1600, Manipur 365, Meghalaya 79, Orissa 322, Rajasthan 9, Sikkim 56, Tamil Nadu 448, Uttaranchal 1, West Bengal 670). Of these, 79 range in size from 0.01 to 900 ha and together embrace 10,511 ha of vegetation cover. Of this area, only 138 ha comprise totally undisturbed vegetation and 3,188 ha have an open canopy. Most of these groves (66 out of 79), covering an area of 10,251 ha, are located in the catchment areas of major rivers and rivulets; 58 (9,621 ha) are at the origin of perennial streams and 38 (6,454 ha) are on hillsides (Malhotra et al., 2000). Another estimate, however, suggests that the number of groves in the country may be as high as 1,00,000 to 1,50,000 (Malhotra, 1998).

**Sacred Groves in Tamil Nadu**

During the British Period, the historical records, legends and folk songs are important sources for the study of the sacred groves of Tamil Nadu. The first modern authentic report of the sacred groves is in the memoirs of Ward & Conner (1994), cited in the 1891 census of Travancore state. Brandis (1897), the first Inspector General of Forests in British India, was awe-struck by the numerous sacred groves along the Western Ghats, in Rajputana and the Kans of the Mysore region. In 1882, he found them occurring upto the Shevaroy hills in the South which were called "Swamy Shola".

Dietrich Brandis, a German forester joined the British Imperial Forestry Service in Colonial India. He documented the sacred groves of Rajputana and Kans (Mysore), the Garo and Khasi hills, the Devarakadus of Coorg, the hills of Salem district, the Swami shola of the Yelagiris, the sacred grove at Pudur on the Javadis and several sacred groves of the Shevaroy hills. This work was done over a period of several years from 1868 to 1879.

**French evidence (Auroville papers)**

The indigenous forest of the Auroville bioregion is called the Tropical Dry Evergreen Forest (TDEF). These forests are found in the sacred groves which are clusters of trees found around local temples of the Auroville region. Field studies suggest that only 5% of the remaining forest cover is close to primary forest. Consequently, the TDEF of southern India is considered to be one of the rarest types of forest ecosystem in the sub-continent. About 250 years ago, this area was thickly
forested as is evidenced by a stone discovered in Kilianur which describes the local king hunting for elephants and tigers in the nearby forest. In subsequent centuries, the TDEF diminished rapidly due to the growth of cities like Pondicherry and Kalapet.

The valuable timber of the local TDEF was exported. The top soil was washed away by the monsoon floods leading to massive soil erosion. In the 1950’s, the last 2000 mature neem trees were cut down to make boats.

The TDEF ecosystem has a canopy that is never more than 8 meters tall. The trees are interlinked by lianas and creepers. The forest canopy contains the nutrient wealth of the forest. When the forest is cut, the soil is quickly leached of nutrients. However, the species that survive include porcupine (Hystrix indica), mongoose (Herpestes edwarsi), and civet cat (Viverricula indica).

The TDEF contains highly diverse vegetation. There are over 160 woody species present out of which around 70 are found within the climax vegetation. The forest comprises of six vegetative elements: trees, shrubs, lianas, epiphytes, herbs and tuberous species. The TDEF contains trees and shrubs which have thick, dark green foliage throughout the year. The number of species present is close 1000. However, at present not more than 500 acres of thickly forested area remains. Many of the listed species of trees, shrubs and lianas are on the verge of extinction (TDEF & Auroville, 2010).

The sacred groves status accorded to the TDEF sites have been largely instrumental in preserving their biodiversity. Cultural values and religious taboos have also played their part in helping to protect the pristine purity of the sacred groves. However, eroding cultural values and changing view of nature, especially among the younger generation, have led to some amount of degradation of the sacred groves (Chandran & Hughes, 1997).

A sacred grove is a primitive holy place which may have an image and may gradually become an elaborate temple. During the pre-Buddhist period no trace of the temple was present (Clark, 1934).
Despite the onslaught of other religions and cultures, the sacred groves have remained as the cradle of ancient rural civilization not only in Tamil Nadu, but also in many other states of India. Conservation of the sacred groves means that we are protecting the ancient socio-cultural and religious beliefs of the remote past. According to Fergusson (1971), the sacred groves are believed to be of pre-Vedic origin.

Meher-Homji (1986) is credited with the first report of a patch of natural vegetation receiving protection due to the presence of deities in Puthuppattu, about 13 km north of Puducherry. It has a temple for Manjiny and Aiyanan, and concrete images of horses and other guardian deities of the village; it also has a *puthu* that is a termite mound with snake holes (a termitarium) which is referred to by the name of *Puthupattu*. This patch of greenery covers an area of 20 hectares. It is a relic of a Tropical Dry Evergreen Forest (TDEF), housing 104 plant species belonging to 44 families. It is also a refuge of rare species like the rare cucurbit *Stychnos lentiecellata*, and the insectivorous plant *Drosera burmanii* and a rare bone setting plant known as *Ormocarpum cochinchinensis*.

Maheswaran *et al.* (1995) have studied the floristics of a miniature sacred grove measuring the size of a basket ball court on the Pasumari hill-top near Vedanthangal bird sanctuary in Chingleput district of Tamil Nadu. With 110 flowering plants in 40 families, it is also a refugium of rare species like *Amorphophallus sylvaticus*, *Kedrosiis foeiidissima*, the rare cucurbit, *Stychnos lentiecellata* and the insectivorous plant *Drosera burmanii*. At the centre is a huge fig tree which is believed to be about 200 years old. Below it clumps of 1 meter tall *Amorphophallus* plants are growing; they flower during June-July and bear attractive red berries during August-September. The fig tree (*Ficus mollis*) provides the ideal atmosphere for its survival and proliferation.

Generally, the sacred groves of Tamil Nadu are dedicated to Aiyanan or Amman. Ravishankar *et al.* (1995) have reported a rare instance of a grove dedicated to Hanuman. Covering a radius of 500 metres, this wooded hillock is considered part of the *Sanjeevi Parvatham* carried by Hanuman to cure Lakshmana who fainted during the *Ramayana* war. A pair of foot marks carved in granite stone is revered by the tribal Malayalis as that of Sri Anjaneya. A sacred grove dedicated to Lord Vishnu
christened as Karimal and protected by the Paliyar and Pulayar tribes on the Palani hills in Dindigul district is also reported.

Balasubramaniyam & Rajasekaran (1996) of the Salim Ali Institute of Ornithology and Natural History at Coimbatore surveyed 23 sacred groves of the Coimbatore Forest Division. They enumerated 82 woody angiosperms belonging to 39 families besides 21 species of birds and three species of mammals.

Oliver King et al. (1997) has published a report on two groves at Suriampettai and Kulandaikuppam entitled 'Marudham Sacred Groves of Cuddalore District of Tamil Nadu'.

Raj & Sukumaran (1997) have studied 167 'miniature temple groves' from the southern districts of Tamil Nadu and found them harbouring rare, endemic and endangered plants of the Western Ghats such as *Antiaris toxicaria, Diospyros malabarica, Diospyros ebenum, Feronia elephantum, Butea frondosa, Garcinia cambogia, Sterculia foetida, Gnetum ula* and *Cycas circinalis*.

Parthasarathy & Karthikeyan (1997) have described the Aiyanar temples, plant biodiversity, vegetation pattern of two sacred groves at Kulandaikuppam and Thirumanikkuzhi in Cuddalore district of Tamil Nadu.

Swamy et al. (1998) have reported larger groves of about more than 10 hectares of Vijayakaruppan Koil Kadu and Paduvayal Kaliamman Koil Kadu from Sivagangai district, AlagarKoilKadu from Madurai district and Nagar KoilKadu from Kanyakumari district. They found *Artocarpus integrifolius, Artocarpus heterophyllus* and *Eranthemum capense* abundantly in less disturbed groves. The Kandanur sacred grove in Sivagangai district supports a rare rattan species (*Calamus rotang*) which might otherwise have vanished from the local landscape.

Parthasarathy et al. (2008) have described 75 TDEF with an ecologically steady state with the bio-resource values and conservation status. They found that physiognomically, evergreen species dominated the forest. Tropical dry evergreen forests (TDEFs) occur as patches along the Coromandel coast of Tamil Nadu. Investigations on plant biodiversity, bio-resource values, and conservation status of 75 TDEF sites were studied. Of the 75 sites studied, species richness of woody plants ranged from 10 to 69 species. Physiognomically, evergreen species dominated the
The study showed that in the sacred groves of TDEF, during the summer, the leaf litter production was high. It showed a significant difference in litter production among plant physiognomic groups. There was also a significant difference between tree and liana leaf litter production within the sacred groves. They also studied the pollination and dispersal spectrum among the TDEF species. Further, they also documented about 150 medicinal plant species which are used for treating various diseases.

The quantitative inventory of tree species diversity in the inland and coastal forest areas were studied by Mani & Parthasarathy (2006) and they reported that the tree diversity in tropical forests varies greatly from place to place, mainly due to variation in biogeography, habitat and disturbance. Human disturbance patterns also affect the structure and composition of the sacred grove sites. Amirthalingam (1998) enlisted the botanical, socio-cultural and ethno-medicinal aspects of 448 sacred groves in all the districts of Tamil Nadu.

Kadamban (1998) have concentrated on the groves in a segment of the Coromendal coastal belt covering the Neyveli-Cuddalore-Pondicherry-Marakkanam sectors. Initially, they enumerated more than 84 groves in and around Pondicherry. Floristic richness and the biocultural perspectives sustaining them have been well documented in 11 important groves. These studies found that the sacred groves protected engendered plant diversity and refugia (Kadamban & Ramanujam, 1999a & b). They also, in another intensive survey, enlisted 163 groves within the Pondicherry region.

Initially, the floristic richness and the biocultural perspectives of eleven groves viz. Mudhanai, Konjikuppam, Varakalpet, Pooranankuppam, Oorani, Omipper, Olagapuram, Thirumanikkuzhi and Kulandhaikuppam, were documented. Of these, Olagapuram is a scrub jungle, Mudhanai is a deciduous segment and Pooranankuppam, Oorani, Omipper, Thirumanikkuzhi and Kulandhaikuppam are TDEF relict patches. Konjikuppam, is an Albizia amara dominated stand (Kadamban, 1998; Ramanujam & Kadamban, 2001). Praveenkumar (1999) studied four more groves at Keerzhbuvanagiri, Periyakumati, Periakkatupalayam and Periamudaliarchavadi. He recorded a Calophyllum inophyllum-dominated grove at Kili Aal Amman temple at Periyakumatti with huge multi-stems. Periamudaliarchavadi
is an old growth stand of *Agalia elaegnoidea* and *Pterospermum canescens* (Ramanujam & Praveenkumar, 2003).

Krishnan (2004) after an intensive survey enlisted 15 groves in this region. And a grove dominated by *Strychnos nux-vomica* was reported by Jayanthi (2007) from Vellarippattu village near Villupuram. Under the guidance of Kadamban, groves at Thiruchitrambalam and Vanur (Kadamban & Maheswari, 2005) and Agasrampattu (Kadamban & Meerabai, 2006) were analysed and brought out their biodiversity values.

A strong association between the qualitative reproductive traits, pollination and dispersal spectrum among the TDEF, 47 species were demonstrated by Selwyn & Parthasarathy (2006).

Mani & Parthasarathy (2007) have estimated the above-ground biomass (AGB) distribution in ten 1-ha plots, established in five groves each in inland and Coromandel coastal region and the reported AGB varied from 39.69 to 170.02 Mg ha\(^{-1}\). Considered for mitigating climate change, the contribution of groves cannot be dismissed altogether.

In an assessment of bioresources, 150 medicinal plant species used for treating more than 52 ailments, were documented. Site disturbance scores were obtained by assessing the various disturbance factors such as site encroachment, resource extraction, grazing, fragmentation, weed invasion etc. (Parthasarthy *et al*., 2008).

Pragasan & Parthasarathy (2009), have studied the list of tree species enumerated from a total of 60 ha area sampled in the tropical forests of southern Eastern Ghats, Tamil Nadu, India. A total of 272 tree species (30 cm girth at breast height) representing 181 genera and 62 families were recorded. Euphorbiaceae with 25 species was the most speciose family, followed by Moraceae (17 species), Rubiaceae (17), Rutaceae (14) and Lauraceae (12). At the generic level, *Ficus* dominated with 12 species, followed by *Diospyros* (9), *Acacia* (6), *Terminalia* (6) and *Grewia* (5). Anthropogenic activities such as hill cultivation, construction of dams, roads, buildings, etc. affect the already fragmented southern Eastern Ghats, and caution the need for effective conservation measures.
Udayakumar & Parthasarathy (2010) reported 312 angiosperm species belonging to 251 genera and 80 families in seventy-five sacred grove forests. The families with the greatest numbers of species were Euphorbiaceae (20 species), Apocynaceae (18), Rubiaceae (15), Fabaceae (12), Mimosaceae (11) and Capparaceae and Asteraceae (10 each). Species richness of woody plants ranged from 10 to 69 species. At the community level, seasonal flowering with unimodal dry season peak and year-round, bimodal fruiting pattern prevailed.

Ialavarasi (2011) studied the conservation values of two small-sized coastal groves situated on the national highway on the East Coast (ECR) of Tamilnadu. The groves are Thenpakkam Ponniyamman koil (TPK) (1200 m²) and Keelpettai Aiyar koil, 800 m² (KAK) near Marakkanam in Villupuram district of Tamil Nadu state. Both groves were dominated by *Memecylon umballatum* but was predominating in TPK where it has grown gregariously with 55 trees ranging from 46 to 270 cm in gbh at TPK, thus giving the impression that it is an old Kasan grove; it only forms a mat of dense but thin boles at KAK and elsewhere. Two giant specimens, such as *Cassine glauca* (86 cm) and *Eugenia bracteata* (613 cm) were also present there. The basal area 10.41 m² ha⁻¹ and biovolume of 98.5 m³ ha⁻¹ compares well with similar patches in this region and in India. The grove at KAK is more disturbed, yet its biomass stacking (BA 12.03 m², BV 129.32 m³, above ground biomass (AGB) 191.26 Mg ha⁻¹ is impressive.

The current threats to the sacred groves have been addressed by Manikandan et al. (2011). In particular, they deal with the status and floristic richness of these groves in Theni district, Tamil Nadu. They have recorded nearly 98 species belonging to 76 genera of 38 plant families. In total, 112 types of plants have been recorded. Out of these, 50 are medicinal plants, 14 have timber value and the others are economically important and are used as minor and major forest products.

Vinothkumar et al. (2011) have discussed the biodiversity and phytosociology of three large sacred groves in Pudukkottai district, namely Suranviduthi, Nadiamman and Manganampatti. The flora of the study area comprises of 106 species belonging to 97 genera distributed among 52 families of flowering plants. Suranviduthi, Nadiamman and Manganampatti groves have 65, 76 and 70 species respectively.
Gnanasekaran et al. (2012) provided a checklist of Angiosperm alpha diversity of Sendirakillai Sacred Grove (SSG), a community conserved Tropical Dry Evergreen Forest (TDEF) fragment located on the Coromandel coast of Cuddalore district, Tamil Nadu. They cataloged a total of 180 species with 2 varieties belonging to 151 genera distributed in 66 families from 29 orders according to the Angiosperm Phylogeny Group III Classification. More than 30% of the total flora is represented by six families namely Fabaceae (14), Rubiaceae (12), Cyperaceae (10), Apocynaceae (8), Poaceae (8) and Euphorbiaceae (7). Three species endemic to India and three species that are confined to peninsular India and Sri Lanka were recorded from the sacred grove.

Sacred groves are generally under the state control a part of Revenue, Forest or Hindu Religious and Endowments Departments. Many are also privately owned by a family, or a group of families, a clan, or a trust; but the daily routines are managed by a village committee. All three types of groves, namely informal, formal and memorial groves are found. To be specific, the grove at Thennampakkam is dedicated to the memory of a saint, Azhaghiya Siddhar. The threats vary from one region to the other and even from one grove to the other. But the common threats identified are: weakening of the traditional belief systems, fragmentation and perforation due to developmental interventions, Spread of alien religions, Sanskritisation, invasion by exotic weeds, over grazing by livestock, pilgrimage and tourism, and fuelwood and medicinal herb collection (Gadgil, 1992; Chandran & Gadgil, 1993; Chandran, 1997; Chandran & Hughes, 1997). However, it must be mentioned that timber extraction which is a major threat in hill areas is minimal but is matched by extensive temple-related activities.

Parthasarathy et al. (2003–2013) re-inventoried all lianas (1 cm diameter measured at 1.3 m from the rooting point) in four 1-ha permanent plots distributed one each in four sites of inland tropical dry evergreen forest on the Coromandel Coast (Pudukottai district) of peninsular India. Among the four sites, Shanmuganathapuram (SP) and Araiyapatti (AP) were much disturbed and the other two sites (Karisakkadu-KR and Maramadakki-MM) were moderately disturbed. We inventoried a total of 3425 lianas representing 37 species of 33 genera and 22 families. Over a decade (2003–2013) liana species richness increased at two sites (MM and SP) and no changes occurred at the other two sites. Liana abundance increased by 210, 211, 164
and 162 individuals at sites AP, KR, MM and SP, respectively, and basal area increased (from 1.09 to 1.76 m$^2$ at AP, 0.67 to 0.86 m$^2$ at KR, 1.68 to 2.06 m$^2$ at MM, and from 0.44 to 1.06 m$^2$ at SP). Over a 10-year period, three species (*Abrus precatorius*, *Canavalia virosa*, and *Cocculus hirsutus*) were lost and five species (*Gloriosa superba*, *Ampelocissus tomentosa*, *Capparis sepiaria*, *Aganosma cymosa* and *Tiliacora acuminata*) were newly added. Total aboveground biomass increased by 18.5, 0.74, 3.6 and 9.5 Mg ha$^{-1}$, respectively, at sites AP, KR, MM and SP (Pandiyan & Parthasarathy, 2013).

Similarly, Parthasarathy and his team have studied the woody plants in ten tropical dry evergreen forest (TDEF) sites on the Coromandel Coast of Tamil Nadu. All trees $\geq 10$ cm girth at breast height and all lianas $\geq 1$ cm diameter, measured at 1.3 m from the rooting point were enumerated. The extent of woody species diversity and estimated carbon stock of the TDEF sites, calls for the need for biological conservation of this unique forest type which are vanishing fast due to the anthropogenic pressure (Vivek & Parthasarathy, 2015b).

**Importance of the present study**

Sacred groves are the last repositories of the thick evergreen forests that once covered the vast areas. Over the centuries, they were gradually degraded and denuded due to anthropogenic interventions. Fortunately, however, these last remnants of rich biodiversity had been protected due to various factors like religious beliefs, economic considerations and social taboos. Thus, they remain as oases of biodiversity preserving the gene pool of many endemic and endangered plant species.

Tamil Nadu being a tropical State endowed with a mean annual rainfall of 1,905mm and tropical climate, the sacred groves are rich in plant and animal diversity. A review of the available literature reveal that the biodiversity of the sacred groves of Tamil Nadu have been explored to a little extent due to religious customs, taboos and beliefs. Considering these cardinal points, the present study has been undertaken to build up a novel scientific data base on the floral diversity of selected the sacred groves of inland plains of Cuddalore and Villupuram districts of Tamil Nadu. Results of the present study are expected to create an awareness among the present and future generations on the need and importance of conservation and
management of the sacred groves hence they are treasure trove of biodiversity and natural gene pool centre’s of the state as well as our country.

A study of the process of biodiversity conservation leads to the conclusion that the survey and documentation of sacred groves in India is still in an ongoing process (Ramakrishnan, 1998). As regards Tamil Nadu, there has been a significant increase in the number of studies during the last two decades. Yet, vast areas still remain to be surveyed and documented especially in the inland plains of Tamil Nadu, for example in the Cuddalore and Villupuram districts. Hence, for this proposed research a few selected sacred groves from the Cuddalore and Villupuram regions have been taken for the purpose of the study on ecological, biocultural and floral diversity perspectives and related to their local cultural affinities.