



RESEARCH ARTICLE

SACRED GROVES OF MAHARASHTRA – A REVIEW

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ABSTRACT

Sacred groves (SGs) are considered as rich source of biodiversity, and also the source of endemic and threatened species. Existence of SGs is since centuries, as a traditional way of conservation and has a significant contribution in the process of biodiversity conservation. SGs are of positive consequential amalgamation of religion and ecology. Moreover, SGs are also significant as most of the plants are being used for medicinal purposes. Present review article is an attempt to bring together the data from published articles, books on SGs of Maharashtra at one platform and with its analysis. Data for the present review article based on the published works, for giving an opportunity to study the various aspects of SGs. Data such as, district wise number of research publications, different type of works done on SGs have been provided.

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INTRODUCTION

SGs are certain areas of forests or natural vegetation that are dedicated to local folk deities or ancestral and tree spirits. These are the forest patches of varying sizes protected by local communities, and which typically have a noteworthy religious connotation for safeguarding the community. (Hughes and Chandran, 1998), defined SG as "segments of land, containing vegetation, life forms and geographical features, delimited and protected by human societies under the belief that to keep them in a relatively undisturbed state is an expression of an important relationship of humans with the divine or with nature". The SGs differ greatly in size, some may comprise only a few plants with smaller land area, while others may have size of hundreds of acres. In India the SGs have been in existence since time immemorial and at present are being considered to be the relics of the original forest vegetation in the region. In India, SGs have been recorded from North-east Himalayan region, Western and Eastern Ghats, Coastal regions, Central Indian Plateau and Western desert, (Malhotra, 2001). The role of SGs in the conservation of biodiversity has long been acclaimed and is documented by several researchers, such as, (Gadgil and Vartak, 1973; 1975; 1976 and 1981; Vartak and Gadgil, 1972 and 1981; Vartak and Kumbhojkar, 1984 and 1985; Vartak *et al*, 1984, etc.).

Vegetation in the SGs is supposed to be under the protection of the ruling deity of that particular grove, and the collection or use of plant resources or even a small twig is a taboo (Vartak and Gadgil, 1973). In other words, SGs can be considered as the *in-situ* conservation practice of the local communities as it is their traditional ecological heritage, which includes and conserves the diverse species in their natural habitat. These SGs are also considered as a rich and vibrant source of ecological, holistic treatments for illnesses, social in terms of reservoir for endemic and threatened species of plants, and SGs may provide emergency foods during periods of drought, crop failure, and food crisis. (Asokan *et al*, 2015) However, local people perceive relationship with SG in different ways, and follow various rules of conduct (taboos) with respect to the sacred space and its components.

In Maharashtra state SGs are found in tribal as well as non-tribal pockets. In western Maharashtra, SG is known as 'devrai' or 'devrahati' whereas in the eastern part it is known as 'devgudi'. In Maharashtra (Godbole *et al*, 1998) reported 250 SGs. (Gadgil and Vartak, 1981) reported 483 SGs from Maharashtra. While a study by Bombay Natural History Society reported, existence of about 1600 SGs in Maharashtra (Deshmukh *et al*, 1998).

METHODOLOGY

For present review, information and data gathered from secondary online/ printed sources like, Journals, books, conference proceedings publications are considered. Further, the publications were categorised as, district wise number of papers/ articles and as per type of work done.

SGs OF MAHARASHTRA: Several studies have been conducted on SGs of Maharashtra. Present review includes 67 publications. Maximum number of papers/ articles are from different SGs of Pune district (28 articles), which is followed by Ratnagiri district (10 articles). There were few papers with the title of Maharashtra or Western Maharashtra on SGs which covered a general aspect or provided inventory.

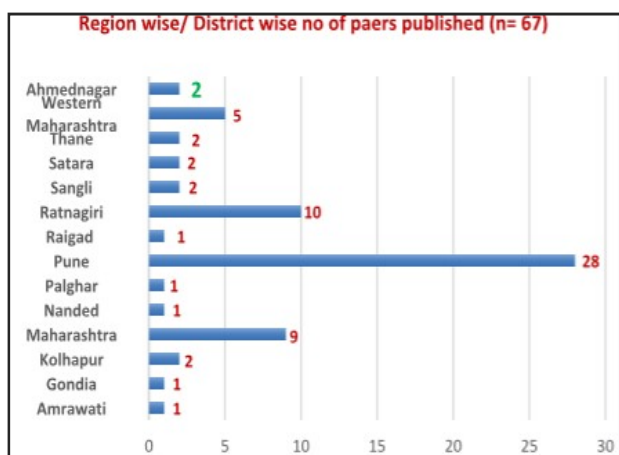


Figure 1. Region wise / District wise no of Papers Published on SGs of Maharashtra

TYPE OF WORKS IN SGs: Different type of works has been done in SGs of Maharashtra which have been categorised in following 13 groups.

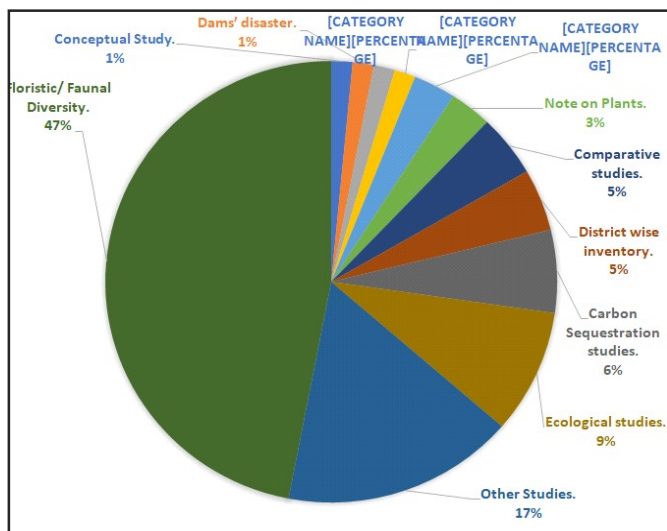


Figure 2. Different type of works on Sacred Groves of Maharashtra

Assessment on Awareness of People about significance of SG: Parkar, (2022) studied awareness of local people about significance of 'Kudavale' SG from Dapoli, Ratnagiri.

Comparative studies: Some researchers have done comparative studies between two SGs or life forms of different SGs or floristic study in and outside SGs or SGs belong to different communities. Gawade *et al*, (2018(b)), have done a comparative study of 4 life forms in 11 sacred groves of Dapoli, Ratnagiri. Burman (1996), have done comparative study of SG among Mahadeo Kolis and Kunbis of Maharashtra. Thete and Sharma, (2017), have compared the status of plant species occurring in Nazaraneshwar SG of Akole, Ahmednagar and its surrounding areas.

Conceptual Study: Nipunageand Kulkarni, (2011), explained 'deo-rahati' (SG)- An ancient concept of biodiversity conservation.

Dams' disaster: Kulkarni and Kumbhojkar, (1999), studied dams' disaster to biodiversity in SG of Western Maharashtra.

Demarcation by GPS: Gawade *et al*, (2018(a)), have done demarcation of some SGs by using GPS in Dapoli, Ratnagiri.

District wise inventory: Gadgil and Vartak, (1973) and Gadgil and Vartak, (1981), provided district wise inventory of SGs of Maharashtra. While, Gadgil and Vartak, (1976), provided village wise SG's and other details from Pune district.

Ecological studies: Several researchers have done remarkable work on the ecological studies on SGs of Maharashtra, such as, Nipunage *et al*, (2009), done ecological survey of SGs from Malshej Ghat, Pune; Kulkarni *et al*, (2013), have done quantitative evaluation of 'Sagadara' and 'Navalachi' monotypic SGs' of Pune; Phansalkarand Kulkarni, (2014), done ecological survey of 'Ajnawale' SG from Junnar, Pune; While, Sathe *et al*, (2017), have done ecological survey of 3 groves from arid regions of Sangali; Johi *et al*, (2015), studied 177 SGs for environmental impact caused, and collected valuable germplasm of rare and endangered species along with documentation of economic and ethnobotanically important plants. While, Kumbhojkar and Kulkarni, (1998), have studied environmental impact of SGs of western Maharashtra.

Carbon Sequestration studies: Hangarge *et al*, (2012), studied carbon sequestration potential of tree species in 'Somjaichi Rai' SG of Nandghur village in Bhor, Pune; Kulkarni and Kulkarni, (2013), studied carbon sequestration in 'Kalamvihira' SG of Jawhar, Thane; Konkane *et al*, (2018), have estimated carbon sequestration of tree species biomass from SGs' of Ambegaon, Pune. While Hangarge *et al*, (2015), have done estimation of soil organic carbon from selected SGs' of Bhor region, Pune.

Ethnobotanical Studies: Vartak and Gadgil, (1972), have done ethnobotanical survey in SG of Western Maharashtra and Ghalme, (2013), has done ethno-medico-botanical study of SGs' of Dapoli, Ratnagiri.

Floristic/ Faunal Diversity: Several works contributed to floristic diversity studies of SGs, such as, Bhise *et al*, (2013), studied floristic diversity of the 'Kalbhairvanatha' SG of Terungan village, Ambegaon, Pune and recorded total 180 angiosperm species. Hangarge *et al*, (2016), compared SGs

and their surrounding areas at taxa level, result showed 'Nivgunjaichi' SG was having 34 families and only 17 in surrounding areas; 'Somjaichi' SG, 48 and 13; 'Maulidevichi' SG 33 and 10; and 'Umberjaichi' SG, 29 and 16 respectively.

Kulkarni *et al.*, (2010), provided the data on prominent species occurring in SG of Bhor region of Pune. Shinde *et al.*, (2011), have studied floristic diversity of 'Udhadavane' SG from Akole, Ahmednagar and recorded 150 plant species. Kulkarni *et al.*, (2013), done evaluation of two monotypic SGs for their habitat conservation, population richness, quantitative assessment of tree diversity and comparative floristic account. Nipunage *et al.*, (1988), studied 'Sagdara' SG in Pune District; Nipunage *et al.*, (1993), studied SGs from Sinhagad hills, Pune; Pawar *et al.*, (2016), done quantitative evaluation of plant diversity of 27 newly reported sacred groves and recorded 105 plant species. Shaikh and Bagwan, (2020), studied floristic diversity of 'Durgawadi' SG of Junnar, Pune and listed 190 plants species. While Vartak and Gadgil, (1981) have studied floristic diversity in different SGs of Pune. Other floristic diversity studies such as, Nagpurkarand Raut, (2015), 11 SGs were studied to understand the concept of traditional ecological and biodiversity conservation in Nagzira Wls, Navegaon NP Corridor in Gondia. Chillawarand Telang, (2021), studied 'Kedarguda' SG from Hadgoan, Nanded and collected 42 plant species. Nipunage *et al.*, (2016), studied floristic diversity of 8 SGs from Palghar. Mhatre and Shinde, (2017), reported 4 new SG from Raigad and studied floristic diversity.

Ulman *et al.*, (2008), studied biodiversity of plants and birds of the SGs in the vicinity of Dapoli, Ratnagiri. Deshpande *et al.*, (2019), recorded 177 plant species under 137 genera belonging to 65 families from 'Kalbhairavnath' SG from Bharsakale, Satara. Mohite *et al.*, (2015), studies floristic diversity of the 'Pateshwar' SG of Satara and reported 363 species. Kulkarni A *et al.*, (2018), studied SGs of Pune for ecological function and their response to physical and degradation associated complications. Saste and Bhagat, (2024), compared status from earlier work with present study of 2 SGs from Maval, Pune. While Mahabaleshwarkar *et al.*, (2023), have studied faunal diversity from selected SGs of Pune and Patil, (2016) studied Spider diversity in SG from Ratnagiri. Some floristic diversity studies included the data regarding, deity, GPS data and number of species, such as, Godbole *et al.*, (1998) from Ratnagiri; Waghchaure and Tetali, (2006) from 14 sacred groves of Pune and Ghate and Datar, (2014) studied in SGs from Pune; Vipat and Bharucha, 2014, of 15 sacred groves from Pune and Kondekarand Gawade, (2020), 10 sacred groves from Kolhapur.

Some other floristic diversity studies on SGs along with additional parameters are also reported, such as, Kulkarni and Nipunge, (2009), floristic diversity and ecological evaluation of SG from Pune; Kavade *et al.*, (2013), floristic diversity and plant animal interaction from Ratnagiri; Nipunage and Kulkarni, (2011), floristic diversity and status of natural regeneration from Pune. Kulkarni A *et al.*, (2014), floristic diversity of 15 SGs with emphasis on northernmost distribution of 5 tree species from Pune; Sathe *et al.*, (2012), studied floristic diversity of trees from Sangli.

Notes on Plants: Upadhye *et al.*, (1987), published note on *Tinospora sinensis* in SG of Pune. Vartak and Kumbhojkar, (1985) reported notes on trees and lianas in SG of Western Maharashtra.

Phytosociological Study: Ghalme, (2018) done phytosociological studies of 'Wanzaloli' SG of Dapoli, Ratnagiri.

Other Studies: Deshmukh, (1998; 1999) provided detailed account of SGs in Maharashtra. While, Bhusare *et al.*, (2013) have studied general aspects of SG of Kalamvihira village, Jawhar, Thane. Omkar and Bhogaonkar, (2016), reported Islamic SG from Amrawati. Kumbhojkar *et al.*, (1996) studied social, cultural and environmental aspects in SG of Mahadeo Koli Tribe localities of Maharashtra. Pruthi and Burch, (2009), have done socio-ecological studies of SGs from Ratnagiri. Tetali and Gunale, (1990), studied status of SGs for western ghats of Maharashtra. Kumbhojkar and Vartak, (1988), studied wild edible grapes from SG from Western Maharashtra. Nipunage *et al.*, (2010), study includes rare and endemic plants in SG from Kolhapur. Kulkarni and Shindikar, (2005), studied threat to SGs from Pune. Upadhye *et al.*, (2004) reported threatened medicinal plants from SGs from Pune. Mahajan and Fatima, (2017) studied water conservation in sacred groves of Pune.

CONCLUSION

SGs are a dynamic structure which may exist over periods as a relic of a natural and human caused ecosystem. SGs are dynamic structures as, the species composition naturally changes with time and also the ecological succession, even without any human disturbances. Most of the published works highlighted about the floristic diversity of SGs, some works provided the data on threatened plants, endemic plants and medicinal importance for human ailments, etc. Some works reveal and discuss about the role of sacred grove in biodiversity conservation. Some articles provided the information about the awareness of people about significance of SG; Dams disaster in SG; inventories of SGs; notes of plants in SG; carbon sequestration studies, ecological studies. The studies on SGs play vital role in conservation of biodiversity. SGs also offer protection to fragile habitats and act as a repository of many threatened and endemic species. However, in some areas some challenges and threats, so SGs need proper conservation and protection strategies in order to save them from the verge of further degradation.

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