

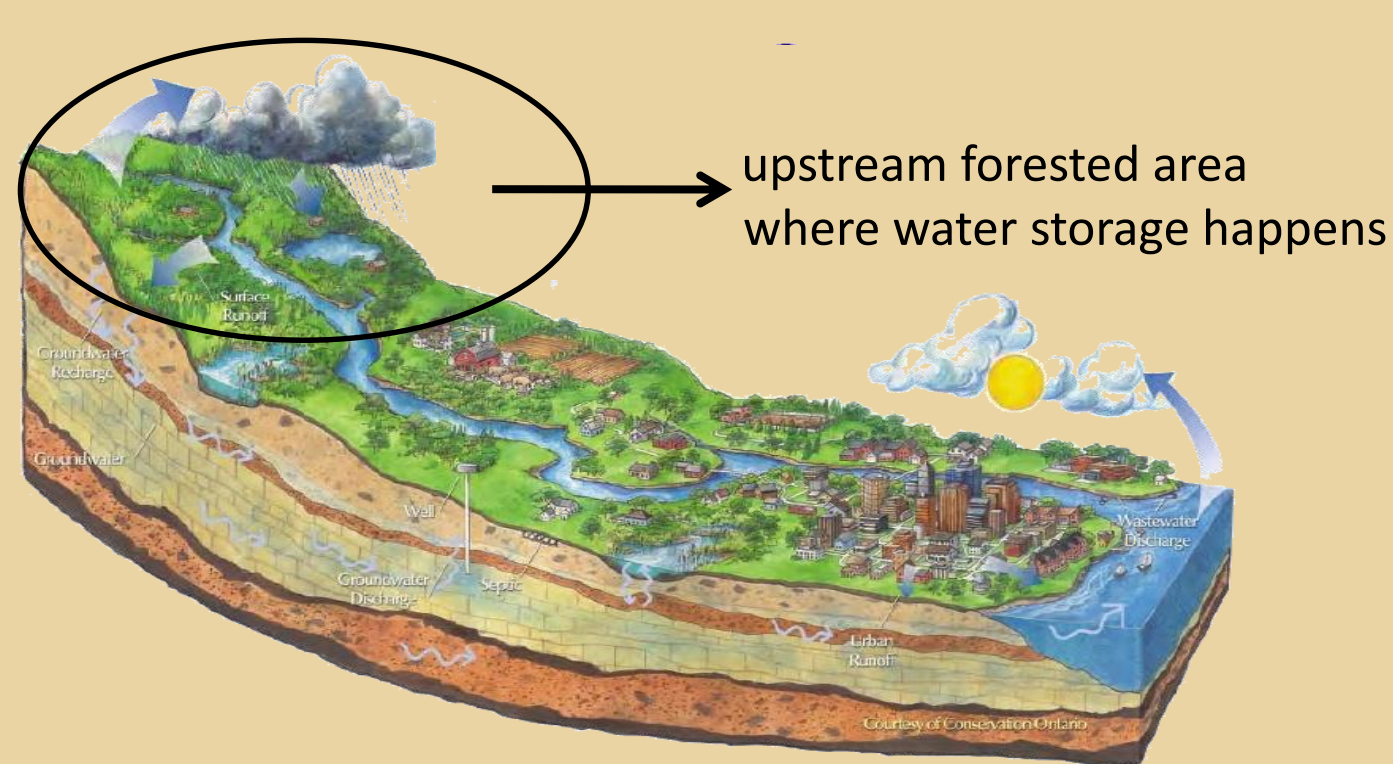
# Ecological relevance of sacred forest patches

Culturally protected forests or sacred groves are forest patches which are protected in the name of god by local inhabitants. Sacred grove maintenance is a world wide ancient tradition associated mostly with indigenous communities. This traditional mode of association with nature has gained momentum in recent time period due to its important role in maintaining biodiversity and ecosystem functions, two must be items for human existence.

Water conservation and maintenance of landscape diversity are two important aspects of sacred grove research. Studies in central Western Ghats have revealed some interesting facts about these issues.

## Sacred grove and local hydrology

Sacred grove and its association with water body is well acknowledged from time immemorial. In Western Ghats, majority of the groves are connected with ponds, streams, rivers and swamps and it is assumed that, the dense evergreen vegetation of the grove helps to maintain local water balance. However, the underneath mechanism is less explored in this regard.



Typical watershed structure and hydrological cycle



Sacred grove and water management in downhill area

In a typical watershed, groves usually present in the upstream or middle region. It is due to their geographical location they have immense impact on

- Run-off and Soil erosion control
- Soil water storage
- Providing microenvironment for diverse group of organisms
- Fresh water supply

## Endemic tree species conservation at heterogeneous landscape

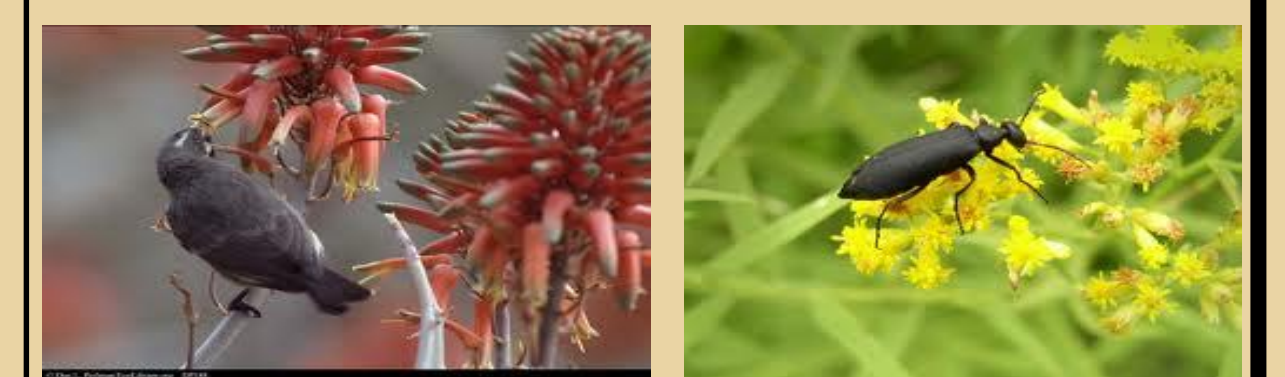
Sacred groves maintain local heterogeneity in production/alterd landscape. These remnant patches provide shelter to diverse group of organisms thus help in local ecosystem functioning. In Western Ghats, groves support a large number of endemic species (both flora and fauna), mentioned by earlier studies, although landscape level understanding has not explored in detail.



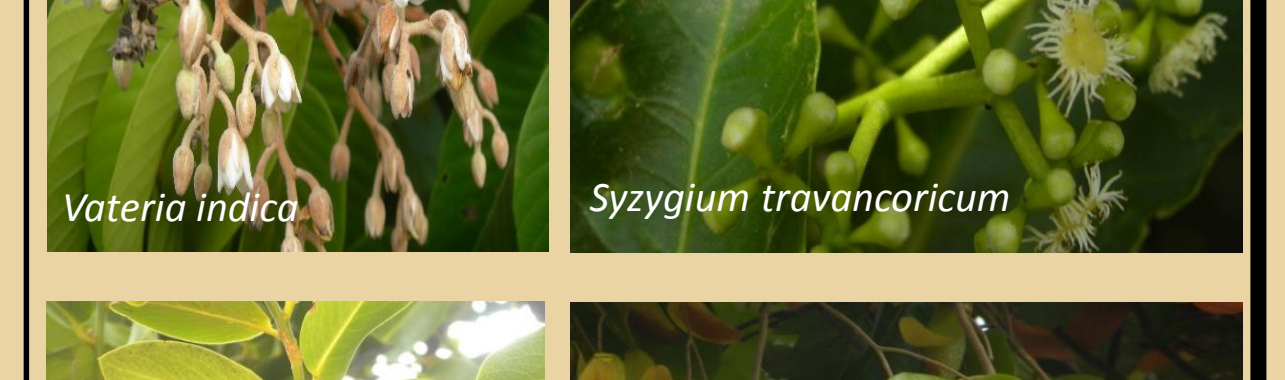
Aerial view of heterogeneous landscape

## Ecological functions to be considered in heterogeneous landscape

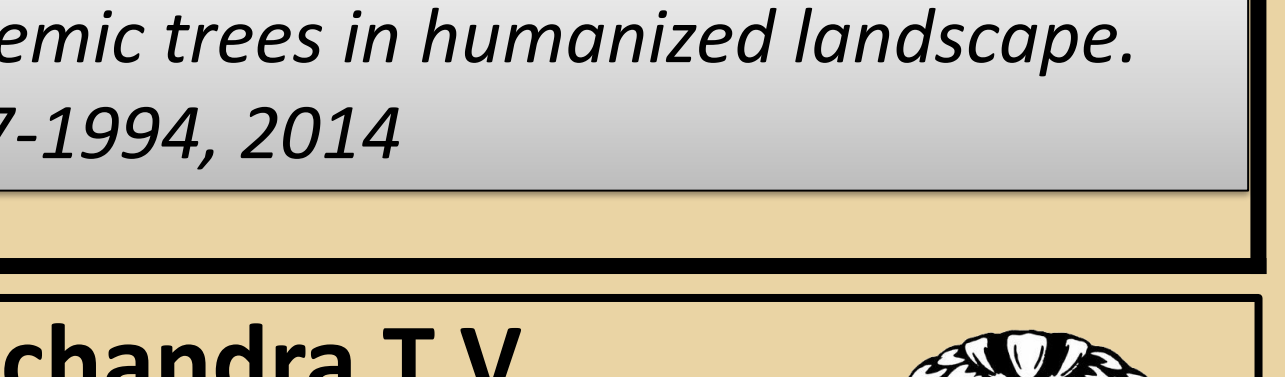
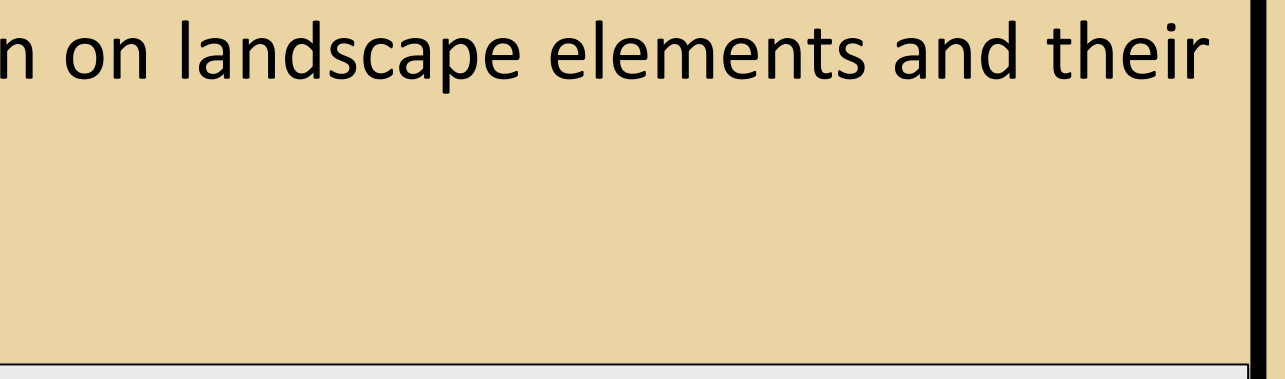
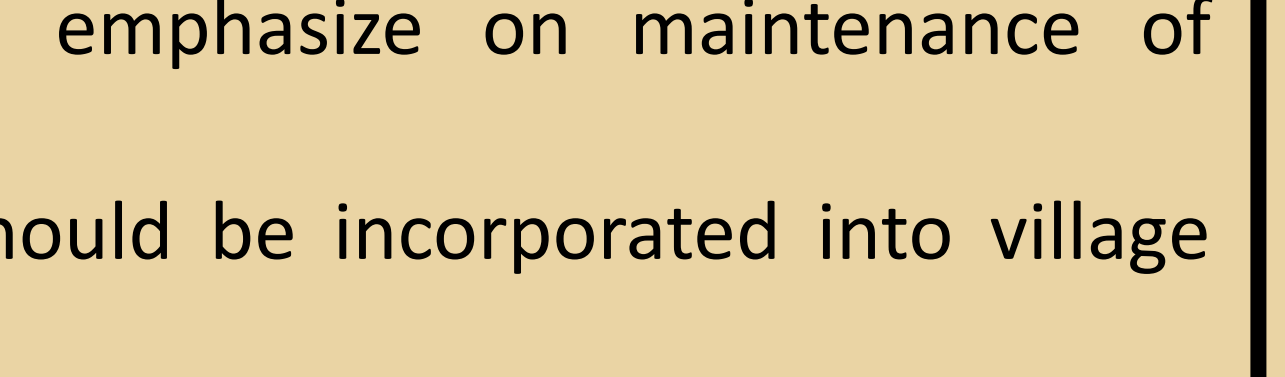
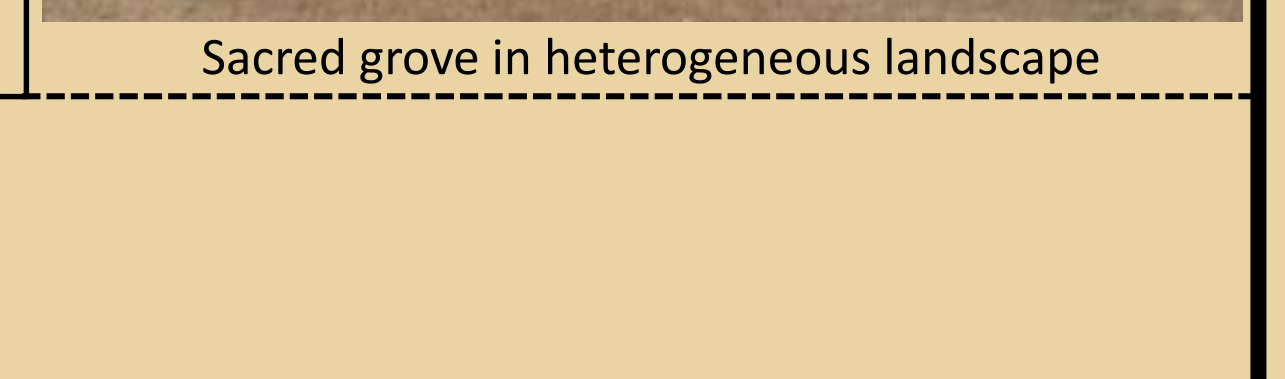
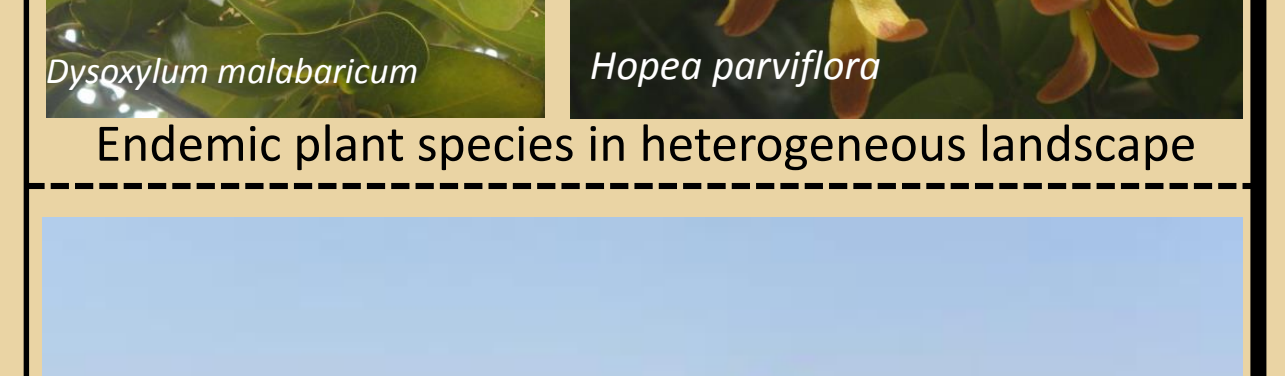
- Food web maintenance
- Life cycle maintenance (shelter, food resource, mating, breeding etc.)
- Pollination and seed dispersal
- Biodiversity conservation
- Landscape connectivity



Pollinators in landscape



Seed dispersers in landscape



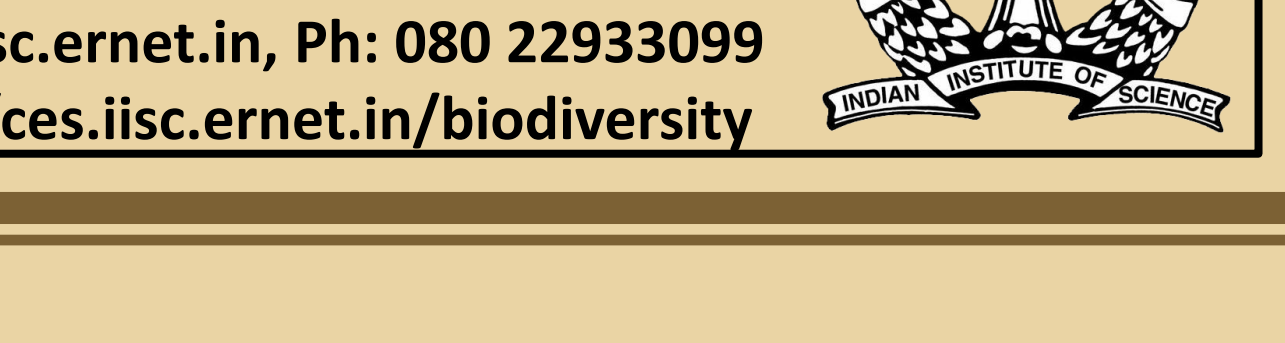
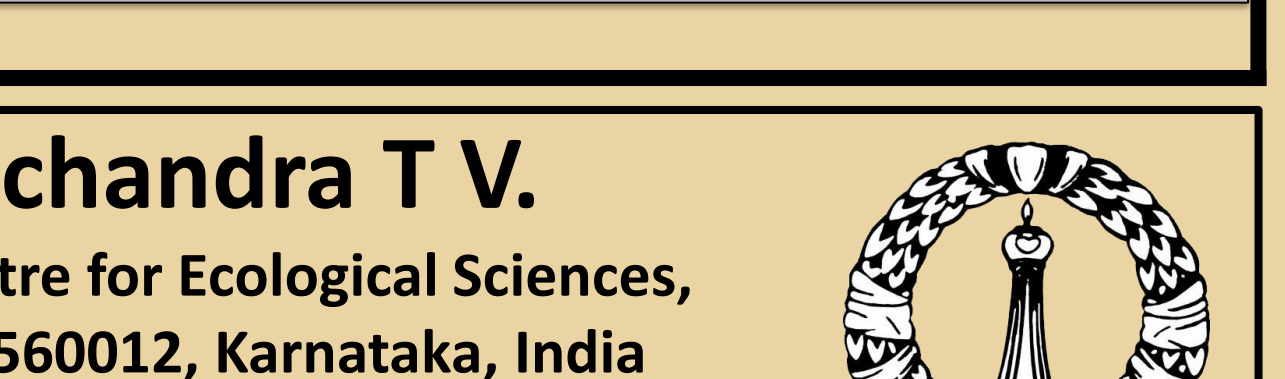
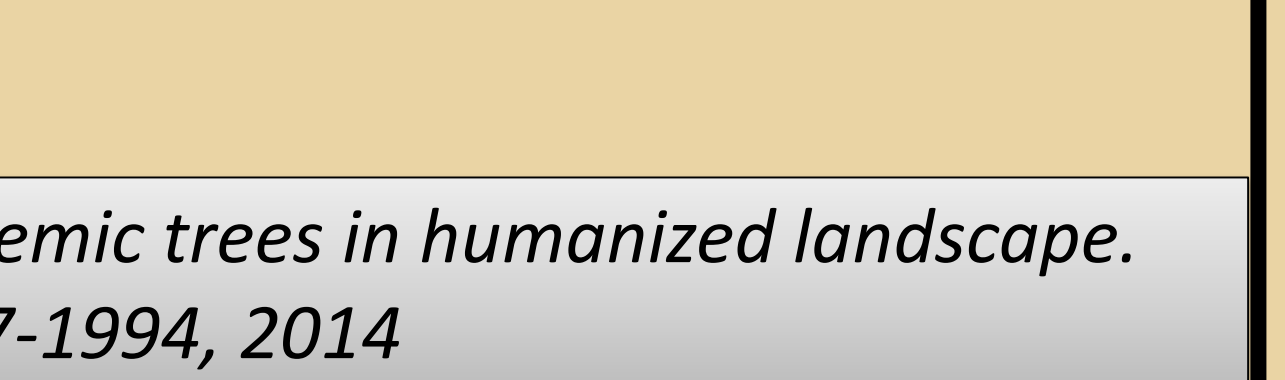
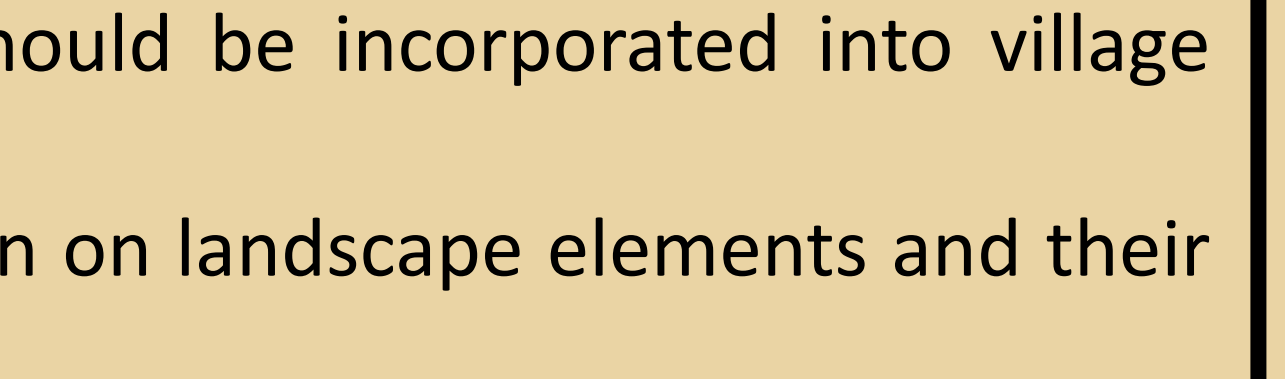
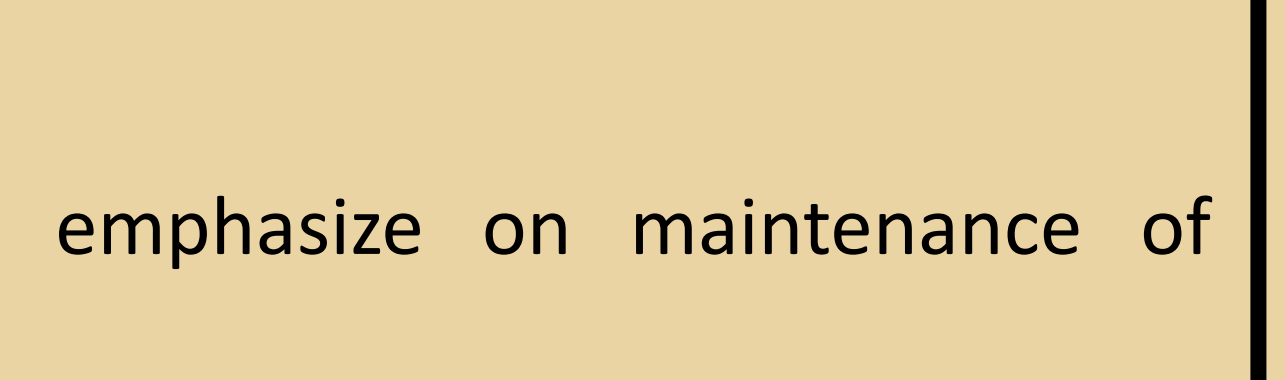
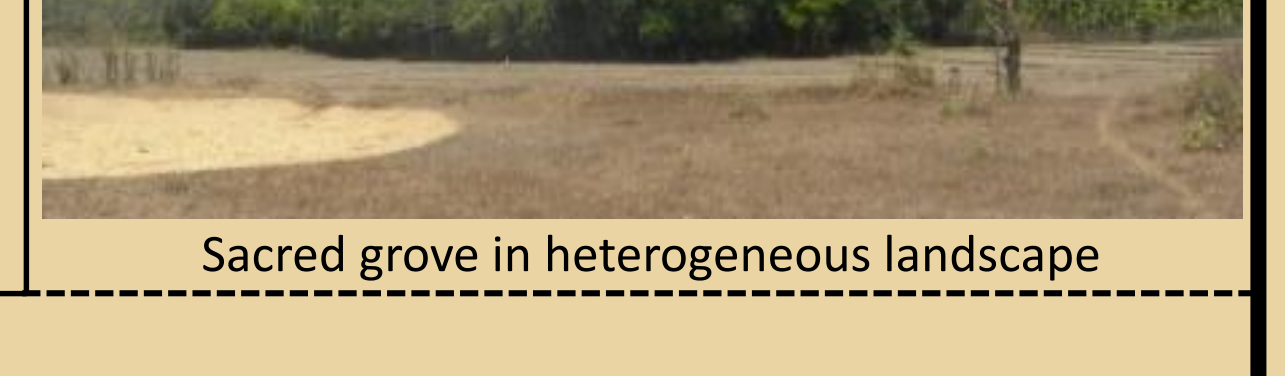
## Sacred groves in heterogeneous landscape

- Maintain original vegetation of the area (although in patchy form)
- Local/regional species pool maintenance
- Supporting local agro-ecosystem through pollination and pest control.
- Carbon sequestration and micro-climate maintenance
- Landscape connectivity for species with wider distribution pattern

## Challenges for heterogeneity –

- Prominence of agricultural intensification and commercial plantation thus leading to homogenization
- Change in socio-religious practices thus negligence in grove management
- Lack of awareness on environmental benefit and long term livelihood support

Endemic plant species in heterogeneous landscape



Sacred grove in heterogeneous landscape

## Discussion –

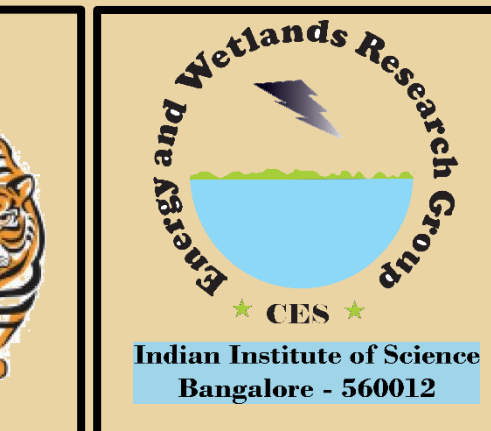
The close association of sacred grove with local hydrological cycle and its impact on livelihood is very evident. The rich species assemblage, better soil moisture profile and comparatively undisturbed forest floor are some of the important factors which contribute significantly for water infiltration and storage. This stored water is available in lean season thus making the stream perennial and facilitates cash crop cultivation in downstream village.

Further reading : Hydrological importance of sacred forest fragments in Central Western Ghats of India. Ray et al., Tropical Ecology 56(1): 87-99, 2015

## Steps to be taken –

- Regional land use planning requires to emphasize on maintenance of heterogeneity
- Remnant natural patches/sacred groves should be incorporated into village development plan
- Generation of baseline scientific information on landscape elements and their field implementation

Further reading : Socio-cultural protection of endemic trees in humanized landscape. Ray et al., Biodiversity and Conservation 23: 1977-1994, 2014



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