

## FORESTS

## Biodiversity, green cover: Bhopal's ecological garden offers shot at conservation

The tree cover in Bhopal has declined by 44% in 2 decades; the urban forest can help compensate for the same

By [AK Bhattacharya](#)

Published: Monday 28 September 2020



The relatively lesser known Ecological Garden (EG) in Bhopal, spread over around 1,700 ha at Katara hills, is a hub of biodiversity and has a range of features: Hillocks, water bodies, a multitude of vegetation, grasslands and geological formations.

The region embraces protected as well as revenue forests in equal measure. The EG uniquely exhibits Alpha diversity (indigenous flora); Beta diversity (habitats); and Gamma diversity that represents diversification at gene pool level.

EG follows the principles of an integrated ecosystem. An EG can be defined as:

The science and art of incorporating a landscape design to improve and maximise production and health of the ecosystem without using synthetic commercial fertilisers, pesticides or fungicides.

An EG promotes practices for *ex situ* conservation of critically threatened species on the red list.

Bhopal is a developing global environmental city. The urban forest of the EG is of special significance — it can help compensate for the declining tree cover in the state Capital.

The tree cover in Bhopal has declined by 44 per cent — to 22 per cent from 66 per cent — over last two decades. At the present rate of tree felling, it would be reduced to 4.1 per cent by 2030, according to a satellite survey conducted by Indian Institute of Science, Bengaluru.

This has been confirmed by another report by Global Earth Society for Environment Energy and Development, according to which:

“Bhopal has been fast heading towards a city-without trees-like situation due to a massive decline in the forest area of Bhopal from 35 per cent to 9 per cent from 2009 to 2019. If the trend continues, the city will be left with only three per cent forest cover by 2025”.

Urban forests, farms, and other urban green spaces have gained attention in global city planning efforts for their capacity to provide shade and cool ambient temperatures through evapotranspiration.

Urban areas can be 8-12 degrees hotter than their rural surroundings due to a phenomenon called “urban heat islands.” Urban forests can act as efficient natural air-cooling systems.

In 2008, the Madhya Pradesh forest department decided to develop this area as a world-class ecological garden. The concept of EG is of a later origin, and is different from botanical garden, biological garden, biodiversity park, etc.

The main objective of the Bhopal EG project is to ensure *in situ* conservation of plant species naturally inhabiting the area and

harnessing the ecosystem diversity. It also envisages *ex situ* cultivation of various taxa of the state.

This, in its own turn, results in the development of gene pool garden at the proposed site. The developed garden could act as source for public awareness with respect to endemic, rare, endangered, threatened, economically and medicinally important plants.

The infrastructural facilities developed through establishment of seed bank, arboretum and vegetative propagation would help in producing diaspores for reintroduction of endangered / threatened taxa for propagation in natural ecosystem, thereby helping conserve ecosystem biodiversity.

The EG should also provide adequate opportunity to develop entrepreneurship in floriculture, cultivation of medicinal plants apiculture, etc, to harness sustainable development through optimal utilisation of natural resources.

According to estimates by local authorities, the EG has sustained 1.85 lakh trees, including 1.55 lakh naturally occurring ones, since 2006. There are equal number of herbs and shrubs in the landscape.

Since 2006, 4.72 lakh plants have been raised by the forest department, which includes around 30 per cent trees.

The Bhopal EG model can serve as a state of art centre for:

- Education and awareness of masses for **conservation of biodiversity**
- Training of students and practitioners in this field
- Ecotourism destination that helps build appreciation for ecosystem conservation
- Developing prototypes of user friendly and replicable conservation educational module for general public, students, practitioners and local communities
- Propagating planting material of threatened and rare species
- Developing a state level database of forest species
- Survey and documentation of traditional knowledge (ethno-biology) associated with forest species

- Capacity building to aid exploration, inventorisation and documentation of the biodiversity, identification of red data list species and species rich areas needing conservation.

The 1,700 ha urban forest landscape also serves as a carbon sink. The forest area has the capacity to sequester around 12,000 mega tonnes of carbon annually. This is in addition to the above- and below-ground carbon stock.

The annual Certified Emission Reductions (CERs) monetary value of this quantity of carbon would be around Rs 60 lakh. Thus, through sustainable management of this urban forest, the state forest department can sustainably generate annual monetary returns of around Rs 61 lakh out of the CERs through clean development mechanism (CDM) projects under Kyoto Protocol.

To sustain the EG and develop it as a global demonstration, effective and innovative management interventions are essential. The special features of the EG, such as herbal gardens and Bambusetum (collection of bamboo trees) need special attention.

The herbal garden model was developed with the objective of conserving medicinal plants. Similarly, a state of art bambusetum for about 200 bamboo species was implemented with around 100 species planted.

Currently, only 40 species exist in the EG. Specific management interventions, therefore, are needed:

- Inclusion of entire forest area in a working plan for its sustainable management
- Development of an exclusive DPR
- Preparation of conservation education plan
- Revival herbal garden and bambusetum
- Management of community activities such as trekking, cycling
- Creation of memorial garden for active public participation
- A research study on ecosystem services of EG
- Creation of an interpretation centre