

7.2.1 Describe at least two institutional best practices Upload details of two best practices successfully implemented by the institution as per NAAC format in your institution website, provide the link (2017-18).

BEST PRACTICE 1 - Ex situ Conservation, Macro propagation and distribution of Medicinal, Endemic and threatened plants collected from Eastern Ghats of India:

Ex-situ conservation of indigenous particularly Endemic and Threatened (Critically Endangered, Endangered and Vulnerable) plant species, their multiplication, Re-introduction and re-habilitation of said plants in natural habitats in collaboration with State Forest Department on project basis.

Establishment of seed banks, arboreta and mist propagation facilities and also to promote education and public awareness in respect of above said plants.

The University is located in a campus spread on 652 acres of land; an area of about 20 acres is exclusively earmarked for the development of a botanical garden. The development of the garden was initially facilitated with financial support from the University. A unique aspect of this botanic garden is the development of one acre of land with artificial hilly mounds established to maintain natural 'hill forests ecosystem'. The Hill County Natural Plantarum' is conceptually something unique for the region. The 'Red Sanders Plantarum' is also an excellent example of an arboretum section conserving a threatened tree species. Presently Botanical garden houses 1800 species and 10,000 plants which include herbal and medicinal plants. The layout of the botanic garden is excellent with about 24 thematic sections, including Medicinal Plants Section, Hill County Natural Plantarum, Tropical Fruit Plantarum, Red Sanders Plantarum, Rock Garden, Rose Garden, Bambusetum, Sacred Plants Section, Cacti & Succulents Section, Fern House, Orchid House, Lily pond, etc.

This botanical garden is one of the largest botanic gardens in the State of Andhra Pradesh and it is really doing excellent work in terms of *ex situ* conservation of rare, endemic and threatened (RET) plants of the Eastern Ghats.

In collaboration with District Forest Authorities, University organizing plantation programmes and distributing medicinal and avenue plants to students and local villagers with the aim to keep the campus clean and green. The objective of the programs was to create awareness among the students and public regarding the importance of endemic and threatened plants.

A Memorandum of Understanding (MoU) has been reached this day of 31-03-2017 between the Ministry of Environment, Forest & Climate Change, GOI and YOGI VEMANA UNIVERSITY with respect to implement the scheme Assistance to Botanic Garden (ABG) vide Ministry's sanction letter No. 10/16/2016-CS/BG dated 31-03-2017 for total amount of Rs. 88,13,640-00 for a period of 3 years. Title of the Project: "Ex situ Conservation and Propagation of Threatened and Endemic plants of Eastern Ghats of India". The objectives of the project are i) Continue professional protection and care for existing trees and shrubs; ii) Continue planting trees and shrubs as needed to maintain a safe and diverse urban forest that promotes learning; iii) Utilize the latest technology to document and monitor species, size, location, and maintenance activities; iv) Continue to keep the tree inventory in the campus; v) Continue University landscape management with a functional approach to

screening, environmental balance, and aesthetic design; vi) Utilize the knowledge of Landscape Services arborists and horticultural professionals to make management decisions in regards to tree maintenance and removal; vii) Create programs that provide education about the maintenance and growth of woody plant species and their proper use in the landscape.

Grow a diverse range of both native and non-native woody plant species that can be viewed for their natural beauty and utilized for learning, recreation, and to bolster energy and storm water conservation efforts. Create plant collections throughout campus to enhance study among related species and native/non-native trees. Organized “Go Green Program” to promote awareness on plants conservation.

BEST PRACTICE 2 – Conducting an advanced/applied research on “Industrial by-product crude glycerol as a source of photocatalytic hydrogen generation using Ni(OH)₂/TiO₂ nanotubes”:

A few TiO₂ nanotubes based nanocomposite photocatalysts reported by Department of Materials Science and Nanotechnology claimed to show enhanced rate of hydrogen production utilizing natural solar light irradiation. Crude glycerol (10% w/w) is produced as a substantial byproduct during the industrial production of biodiesel via transesterification processes. Catalytic hydrogen (H₂) generation by utilizing crude glycerol and solar light is considered as a promising avenue. The present work illustrates enhanced rates of H₂ generation and co-catalyst behavior of Ni(OH)₂ decorated on TiO₂ nanotubes dispersed in aqueous crude glycerol solution (industrial byproduct) under solar light irradiation. The optimal loading of Ni leads to a high rate of photocatalytic H₂ generation of 4719 μmol h⁻¹ g_{cat}⁻¹ and it is ~12-fold higher than pristine TiO₂ nanotubes. The solar light energy conversion efficiency of the optimized catalyst and cost benefit analysis by using crude glycerol are also evaluated. The high electronegativity of Ni(OH)₂ quantum dots present on the surface of TNT may facilitate effective shuttling of photoexcitons, thereby largely preventing electron-hole recombination in TiO₂ during photocatalysis.

