



# SDG 15: LIFE ON LAND

## PROTECT, RESTORE AND PROMOTE SUSTAINABLE USE OF TERRESTRIAL ECOSYSTEMS, SUSTAINABLY MANAGE FORESTS, COMBAT DESERTIFICATION, AND HALT AND REVERSE LAND DEGRADATION AND HALT BIODIVERSITY LOSS

The campus was planned so as to lay emphasis on preserving natural lakes and drainage patterns to the extent possible and ensured minimum impact on the river and its ecosystem by isolating the development from the river. The institute supports or organises events aimed to promote conservation and sustainable utilisation of the land, including forests and wild land. Faculty at the Humanities and Social Sciences discipline are involved in research work related to human-wildlife interactions, wildlife conservation, etc.

### Research

The institute has been undertaking research in areas related to natural resource management, wildlife and ecosystems. About 10 researchers work in these areas and have published articles related to vegetation health, relationship between irrigation and land surface temperature, etc in the year 2019-20.

### Operations

The campus development concept establishes a broad

landscape structure for the campus, a planned system of open spaces and vegetation that is responsive to specific landscape qualities of the site.

The ravines represent a degraded landscape that can become an asset through rehabilitation. Through erosion control and encouraging the growth of native species, the ravines can be utilised as a picturesque landscape feature whilst at the same time serving useful environmental functions. The ravines are the subject of land rehabilitation, stormwater management and soil conservation through erosion control and new planting. They are the second major anchor of the landscape structure, an extensive area where the existing “natural” identity of the landscape is protected and enhanced, in contrast to other necessarily more formal spaces of the campus.

Two seasonal ponds situated in slightly low lying areas amidst the former agricultural fields have been retained and integrated with the storm water management system. The boundary edge along the river is the subject of land rehabilitation and soil conservation and is stabilized through erosion control measures and plantings.

Originally the landscaping work in the ravines called for stone pitching to hold the hillsides (see stone walls in lower left of the photo). However when campus planners were introduced to geosynthetics they realised that this might be a better option for hillside stabilisation while keeping the slopes green. They began using geosynthetic fabrics with a toe wall of gabion on the ravine slopes. These fabrics are made from polymers and have the advantage of being both permeable and flexible by growing grass on top with their roots gripping the soil below. The geosynthetic fabric on the ravine embankment is visible in the centre of the photo. In addition, check dams have been built at a few key locations. These small dams provide a minimal stone wall at the lowest and narrowest point in a ravine to hold back soil and moisture that is washed through the ravine during the monsoons.

The natural vegetation of the ravines at the site serve as habitat for native flora and fauna, with high ecological value and the manicured open spaces serve as active and passive recreational spaces along with fulfilling an aesthetic function. Seasonal ponds have been retained and used as landscape assets, helping in reducing the urban heat island effect and improving the micro climate. The northern parcel of the site is used only in part, leaving a substantial portion as habitat for ‘nilgai antelope’ and other existing fauna. Many sections of the ravines lie below the highest flood level of the Sabarmati river, and the Masterplan calls for the river bank to be protected from erosion during floods. Emphasis has been placed on using native species of trees and plants in the campus landscaping, retaining around 90 per cent of the existing

trees through careful siting of buildings and tree transplantation for some existing trees. 75 neem trees were saved from cutting and transplanted along the boundary. The design of some of the buildings was such that it considered the location of existing trees.

Spread over an area of more than 400 acres, IIT Gandhinagar has varied habitats which are home to a rich biodiversity. A biodiversity survey was conducted in 2017, in collaboration with Gujarat Ecological Education and Research Foundation. The survey is still under progress considering the need to survey different biodiversity elements in different seasons over different years.

Plantation of diverse tree species, small wetland created between hostel and residential areas, a river and riverine ecosystem in immediate vicinity organic farm and the surrounding wilderness forming mosaic of microhabitats contribute significantly to the campus' biodiversity. Old trees at the institute have been thoughtfully conserved during the campus planning and development stage. The survey conducted so far has reported over 120 and 150 major floral and faunal species respectively.

There are several species of plants, birds and animals in the campus. Students are encouraged to protect and preserve the ecosystem and live harmoniously with these other species. Please note that there is a presence of stray dogs inside the campus. Considering that not all members of the community like to interact with them, the Institute Animal Welfare Committee has designated certain petting and feeding areas for dogs. Students must use only these designated zones if they wish to feed and pet the dogs. Feeding and petting dogs within the hostel area and the academic complex is not allowed in the interest of the larger benefit of the entire community.

The basic water quality parameters, including pH, turbidity, TDS and chlorine are monitored and documented regularly by the Institute Works Department. Samples of water are collected and sent to laboratories for analysis to ensure compliance with the state and national level pollution control regulatory framework. This exercise helps in assessing and preventing any polluted water from entering the water distribution system and to uphold water quality in order to protect ecosystems, wildlife, and human health and welfare.

Waste disposal of hazardous materials is carefully handled, including the collection of the chemical waste of the labs by a designated agency. Dedicated areas are provided to store construction materials on site. Construction waste is segregated and also stored at different locations. Separate storage facilities for inert and hazardous construction wastes are allocated and measures are employed for its safe disposal/recycling. Scrap materials are sent to a waste recycling facility.

Constant reminders of the need to reduce and segregate waste are made on all possible occasions, such as initiatives to promote reusable materials and discourage single-use materials (especially plastic). For instance, only reusable bottles, glasses, cutlery and plates are used in the tea stalls and at meetings and conferences, etc.; the use of disposable packaging items is not allowed/discouraged.

A green bottle initiative has been in place for several years throughout campus, where campus staff, students, faculty and visitors are all encouraged to use reusable green plastic water bottles rather than single-use plastic water bottles. In meetings, green water bottles, and increasingly glass bottles, are provided and guest apartments are also provided with such bottles. In recent months, reusable green plastic bottles are being replaced with reusable glass bottles.

The IITGN campus has been constructed in an area which hosted several native animals, such as dogs, nilgais, langurs, hare, snakes, etc. Such infrastructural developments often lead to human-animal conflicts. It is necessary that the practices followed within the campus are humane and ethical and a general resident may be unaware of all aspects of their behavior towards animals. The institute has issued an advisory on animal management within IITGN campus which lays down a set of humane and ethical practices to minimize human-animal conflicts and ensure smooth functioning of the institute processes.

## Education

Winter School: The HSS discipline of IITGN organised a week-long 'Winter School on Social Science Research Methods for Conservation Biologists and Practitioners' from 9 to 15 October, 2019. Nature conservationists from across the country attended the programme. The event was coordinated by Prof Ambika Aiyadurai.

Dibang Seminar: The HSS discipline of IITGN organised 'Dibang Research Seminar: Initiating Dialogue Between Idu Mishmi and Research Scholars' on 10-11 December, 2019, at Anini, Dibang Valley district in Arunachal Pradesh. Around 15 Resource persons from various organisations, scholars, leaders and shaman priests from the Idu Mishmi community conducted the sessions. The seminar was coordinated by Prof Ambika Aiyadurai.

Invited lecture on 'Composing Actor Networks and Collective Action for Community Based Climate Change Adaptations in Coastal India' by Prof Thomson Kaleekal, Cochin University of Science and Technology (CUSAT), was organised on 13 September, 2019.

Other courses on the environment included the following:  
CE 202: Sustainability and Environment  
CE 303: Geospatial Engineering

CE 309: Field Survey Project  
 CE 605: Remote Sensing of Land and Water Resources  
 CH 517: Bioinorganic Chemistry  
 EH 301: Field Practices in Earth System Sciences  
 EH 302: Elements of Earth System Science  
 EH 601: Earth Surface Processes in the Anthropocene  
 EH 606: Critical Zone System Science  
 EH 608: Biodiversity Conservation and Sustainable Development  
 ES 652: Introduction to Electrical Systems

## Community outreach

### ***Earth Day celebration***

The IITGN community celebrated the International Earth Day on 22 April, 2019, by organising a number of activities to spread the message of “Save the Earth, Save the Environment” collectively. The celebrations included eco talks on various topics and a nature bazaar. A short film on green practices at IITGN was also released on the occasion. The event was coordinated by the Green Office, IITGN.

### ***Quantitative Geomorphology***

IITGN organised a national workshop on Quantitative Geomorphology from 7 to 21 February, 2020. This two-week workshop was coordinated by Prof Vikrant Jain.

### ***International conference***

IITGN in association with the Indian Council of Social Science Research (ICSSR), New Delhi, organised a three-day international conference on Affect, Embodiment and Ecology: Multi-disciplinary Perspectives during 2-4 March, 2020. This was coordinated by Profs Ambika Aiyadurai, Arka Chattopadhyay and Nishaant Choksi.

### ***Organic Farm***

The IITGN organic farm grows several varieties of vegetables, such as cabbage, cauliflower, tomato, brinjal, potato, cucumber, bottle-gourd, ladyfinger, spinach, fenugreek, carrot, beetroot, cluster beans, long beans, chillies, green garlic, green tuwar and coriander, etc. It also cultivates special vegetables like broccoli, kale, zucchini, lettuce, pumpkin, etc. Farm activities are being expanded by growing millets and wheat. It uses only completely organic fertilisers for growing various crops. Community members participate in the volunteer programme and contribute to the organic farm activities. The organic farm produce is sold to the community. The ground floor apartments of staff and faculty have been provided with kitchen gardens. The organic farm group has delineated spaces in housing areas for kitchen gardens and encouraged residents to actively participate and grow vegetables and fruits of their own choice. Adequate guidance and materials are provided by the organic farm representatives.

