

# Universities facing Climate Change and Sustainability

Edited by **Tristan McCowan,**  
**Walter Leal Filho, and Luciana Brandli**



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## Chapter 6: India

*Golda Edwin and Nandhivarman Muthu*

### Sustainability and climate action in the higher education system

Post-secondary education in India is among the largest in the world with around 965 degree-awarding universities or institutions, 42,000 colleges and over 35 million students. The universities are broadly classified as Central (54), State (417), Private (369) and Deemed to be Universities (125) (UGC, 2020). Central Universities along with multiple Institutions of National Importance such as the Indian Institute of Technology, the Indian Institute of Science, and the All India Institute of Medical Sciences are established under the Central Act and sponsored by the Central (Federal) Government, while the State Universities are funded by the State legislatures or through private funds (MoE, 2020). The All India Council for Technical Education (AICTE) was founded in November 1945 to support country-wide technical education. Following this, the University Grants Commission (UGC) was founded in 1956 to maintain the quality of education and also to be responsible for establishing standards at both the Central and State level. It also provides the qualifying colleges with financial assistance and governs the associated universities. Universities associated with UGC have full freedom to introduce new courses that they think are important and suitable for national needs. Under Section 3 of the UGC Act, ‘Deemed to be University’ status is granted. They usually follow a smaller range of degrees and specialisations and are not currently able to obtain grants from the Centre or State. Besides, The National Assessment and Accreditation Council (NAAC) an autonomous body funded by the UGC was founded in 1994, to assess and accredit higher education institutions (HEIs) in India (NAAC, 2020).

More recently, the Union Cabinet of India approved the National Education Policy 2020, thus ushering in a new era of school and higher education in India by setting up a ‘single overarching umbrella body

for the entire higher education’ – the Higher Education Commission of India (HECI) – with distinct and independent bodies which will assume separate functions like accreditation, funding, and academic standard setting. The UGC, AICTE and the National Assessment and Accreditation Council (NAAC) are expected to be merged under this policy from 2021 (Kumari, 2020).

Research funding to the universities is mainly through India-centric research funds that include various government departments such as the Council of Scientific & Industrial Research (CSIR), Defence Research & Development Organisation (DRDO), Department of Electronics and Information Technology, Indian Council of Agricultural Research (ICAR), and the Indian Council of Medical Research (ICMR). Other sources include international collaboration funds such as the India-Republic of Korea Joint Applied R&D Programme Funding, Deutsche Forschungsgemeinschaft (DFG – German Research Foundation), Indo French Centre for the Promotion of Advanced Research (IFCPAR), Indo-US Science & Technology Forum, UK India Education and Research Initiative (UKIERI), and the Global Innovation Technology Alliance. Universities usually find it challenging to secure research funding from government schemes due to complicated processes and red tape. To mitigate this, a new National Research Foundation (NRF) has been proposed as an independent body to boost research in science, technology, humanities, and social sciences at universities in India and will be allocated one percent of the national budget.

Traditionally the Central Universities and Institutions of National Importance contribute to the bulk of research and development at the tertiary level. However, a recent study observed that private universities show significant growth in research output during recent years. Private universities also tend to have relatively more international research collaborations (Banshal, Singh and Shankar, 2019).

The Government of India has also initiated several National Missions to ensure the wellbeing of its citizens. The missions spread across sectors such as Agriculture, Education, Electricity, Healthcare, Urban



Planning, and Rural Development. The National Mission for Education includes missions such as Sarva Shiksha Abhiyan (to universalise elementary education), National Translation Mission (to make knowledge accessible in all Indian languages), and the National Mission for Manuscripts (to conserve manuscripts of historical significance).

India is among the few countries which have enshrined a commitment to environmental protection and improvement in the constitution through Art.51-A (g) - 'the fundamental duty of every citizen to protect and improve the natural environment including forests, lakes, rivers and wildlife and to have compassion for living creatures'. When it comes to environmental education, the Ministry of Environment, Forest and Climate Change (MoEFCC) and The Ministry of Education (MoE), formerly the Ministry of Human Resource Development (MHRD) play a major role, with the former dealing with the informal education sector and the latter handling the formal education sector (Muppudathi, 2012). On one hand, the Environment Education (EE) Division of the MoEFCC has produced several modules as part of its Environmental Education Awareness and Training Scheme programmes. These initiatives were enforced through two main programmes – National Nature Camping Programme (NNCP) and National Green Corps (NGC) (Rathore, Khanna and Puri, 2015). On the other hand, the Higher Education division of the MoE has initiated “Jal Shakti Campus and Jal Shakti Gram”, a set of strategies and guidelines proposed to bring water sustainability to villages and campuses of the Indian HEIs.

Following the historic conference on Human Environment held in Stockholm in 1972, the National Committee of Environmental Planning and Coordination was established. With the Environment (Protection) Act, 1986, the National Policy on Education in 1986 brought about the introduction of environmental education into the formal education system at all levels (Nandhivarman, 2017; Goel, 2018). The universalisation of environment education was mandated and made compulsory by Supreme Court Orders in 1991 and 2003 respectively. This encouraged India's leading schools to offer environmental management courses as elective courses in

their postgraduate degrees. The National Curricular Framework of 2005 was another landmark initiative that emphasised an integrated approach to environment education (Nandhivarman, 2017). Since then many more HEIs have incorporated courses on environmental management in their curriculum. Such steps were also heavily affected by the directives of the regulatory agencies in higher education and the judiciary (Bantanur, Mukherjee and Shankar, 2009). The 2005 National Curriculum Structure further stressed environmental sustainability and suggested project-based learning. The UGC launched a compulsory six-month course on environmental studies for undergraduates from all backgrounds in 2016. The Indian Institute of Science Education and Research, Pune, was tasked with establishing a pedagogy for climate change education in undergraduate education (Goel, 2018). One of the most important developments has been the UGC declaration of 2019, which made environmental studies a compulsory subject, by introducing the module syllabus for environmental studies for undergraduate courses of all branches (Abhinav, 2020; Bharucha, 2005).

More recently, the AICTE released its Environment Policy 2020 (AICTE, 2020). The policy aims to educate and engage students and employees on environmental concerns and sustainability, to make institutes carbon-negative, to incorporate environment concerns in planning and decision making, and to encourage collaboration. The Government of India has tabled a new National Education Policy proposing a holistic and multidisciplinary education through value-based environmental education, encompassing areas such as climate change, pollution, waste management, sanitation, conservation of biological diversity, management of biological resources and biodiversity, forest and wildlife conservation, and sustainable development and living (Government of India, 2020).

None of India's elite HEIs such as IITs, IIMs, NITs and central universities are featured in the Times Higher Education (THE) University Impact rankings 2019. This raises doubts as to whether India's leading institutes are also responsible campuses that foster equity and sustainability in educational delivery, and illustrates a critical feature of internal sustainability



initiatives that most HEIs in India refuse to stick to. HEIs need to take the lead in maintaining India's art and history, with their nuanced skills and wise use of emerging technologies while being sustainable in approach (Sengupta, 2019). Parvez and Agrawal's (2019) qualitative assessment of nine Indian HEIs based on the framework provided by the Sustainability Tracking, Assessment and Rating System (STARS), and the University of Indonesia (UI) GreenMetric World University Ranking (UI GreenMetric WUR) shows that, though Indian campuses are adopting sustainable development initiatives, over 50 percent of the criteria are not being met. There was a lack of regulation, tracking, and reporting systems.

The research work of Bantanur, Mukherjee and Shankar (2015) shows that the vision statements of Indian HEIs tend to be more focused on curriculum reforms, networking and information, special grants, scholarship to students, information and communication technology while ignoring the importance of sustainability practice in their objectives. A few HEIs practice aspects of sustainability like rainwater harvesting, solid waste management, wastewater management, sustainable transportation, biodiversity, and renewable resources, etc, with still a long way to integrate these practices into the culture and vision and mission statements.

Several Indian universities have set up climate change study centres. Some of the prominent ones include:

- The Divecha Centre for Climate Change was founded by the Indian Institute of Science (IISc), Bangalore, India. The centre's primary aim is to measure climate change and its environmental effects and identify solutions that can help offset climate change. The IISc is also part of the Indo French Cell for Water Sciences (IFCWS), a bi-national collaboration organisation. Its aims include comprehensive water and soil studies in India, ranging from local (soil-plant profile) to subcontinent scales. The partnership takes place in such fields as hydrology, geochemistry, remote sensing, agronomy, oceanography, geophysics, soil science, and climate change. There are also collaborations with countries in Southeast Asia and Africa (Ray, 2020).

- Indian Institute of Science, Education and Research (IISER) Pune, named by the Government of India as the National Resource Centre on Climate Change, has launched an online course offering instruction for teachers in all disciplines on the use of modern pedagogical approaches to incorporate climate change based materials. Academics at IISER Pune are pursuing studies on Himalayan glaciers, climate cycles, monsoons, and tropical seas. The latest research publications include emissions (of greenhouse gases, non-methane volatile organic compounds and particulate matter) from open urban waste burning in India. Researchers in the Earth Sciences Department at IISER Kolkata work on paleobiology, river reactions to climate change, atmospheric black carbon and other optically active aerosol organisms.

Indian campuses have a huge opportunity to expand on their sustainability programmes. Analyses and reviews need to be in place to guide their efforts, along with adequate funding for collaborative research.

## **Institutional Case Studies**

### **Indian Institute of Technology, Gandhinagar**

The Indian Institute of Technology, Gandhinagar (IITGN), founded in 2008, is a public engineering institution located in Gandhinagar, Gujarat, India. IITGN is spread across an area of 400 acres, with 1085 students and 120 staff. The operating budget of the campus includes a capital expenditure of US\$3.3 million and an operational expenditure of US\$12.8 million. Among engineering colleges, IITGN was ranked 14<sup>th</sup> by India Today in 2018 (IITGN, n.d.).

According to the IITGN Director, Prof Sudhir K Jain:

*Sustainability and climate change are central to IITGN. We have emphasised sustainability across the campus, which includes water conservation, purification, recycling, comprehensive waste management, compost production and solar energy generation. The IITGN community is also actively engaged in promoting sustainability in all its operations by developing a system*



*for monitoring in real-time the carbon and water footprint of the campus.*

Sustainable design elements have been widely incorporated across the IITGN campus, for example, low energy and resource consumption are among the guiding principles of campus development. The masterplan paid particular attention to preserving natural water bodies, natural landscape and drainage channels. IITGN became the first campus in India to be awarded a 5-star rating by Green Rating for Integrated Habitat Assessment for Large Developments. Sustainable campus operation practices include waste segregation at source, conversion of organic waste to manure, zero discharge campus (in-house STP), recycling paper and thermocol waste are amongst others. IITGN has developed strategies for carbon reduction plans, although these lack any specific targets and timeframes. The entire administration, faculty and students were involved in a consultative and participatory process.

To reduce its carbon footprint, IITGN adapted the system of Passive Downdraft Evaporative Cooling (PDEC) in the student dining area for air-conditioning so to minimise the energy consumption rate. There is a 500kW capacity solar energy harvesting plant, and a one metric ton installed biogas plant for generating 90-120 kW of electric power and offering a public mode of transportation and conserving native species in the campus for mitigating the carbon footprint at the campus level. Energy efficiency and solar power generation are aligned with the National Solar Mission, an initiative of the Government of India and State Governments to promote solar power. The mission is one of the several policies of the National Action Plan on Climate Change.

Understanding sustainability as a basis for campus development, several steps were taken to improve sustainable development without compromising other goals. The core goal of climate action and sustainability can be seen through activities such as involvement in the development of the State Action Plan on Climate Change (SAPCC) for Gujarat State, and by playing a lead role in National Communications developed by the MoEFCC. IITGN constituted a dedicated Green Office concerning sustainability

and climate change in campus development with the support of the Dean, Campus Development and Advisor, Institute Works Department and Kiran C Patel Centre for Sustainable Development in promoting policies and practices and supporting research related to sustainability. The Green Office comprises a team of faculty, staff and students who work to create better awareness and implement activities on campus and in neighbouring villages, focusing in particular on waste management, compost production, and awareness programmes. It aids in steering sustainable development practices and inculcating behavioural changes.

According to the Director:

*The Kiran C Patel Center for Sustainable Development was established to focus on water, pollution and waste management, energy, climate change and natural resources, wildlife and ecosystems. We aim to develop a strong outreach programme of training, education, awareness and community engagement on sustainable development and promote networking and collaboration among scholars, policymakers, industry, non-profit organisations and other stakeholders.*

The Centre conducts an annual Sustainability Fair and a regular Sustainability Seminar Series to encourage active collaboration and networking amongst a broad range of stakeholders. The institute has been taking steps to address all of the SDGs and aspires to be an exemplary model for the country.

IITGN faculties are involved in several national and international networks on sustainability and climate change. Outcomes include the Housing and Urban Development Corporation Limited (HUDCO) Best Practice Award to Improve the Living Environment 2013-14, HUDCO Design Award for Cost-Effective Disaster Resistant Housing 2015, HUDCO Design Award for Green Buildings 2016, Rank 4<sup>th</sup> in Swachhata Ranking 2019, Yes Bank Natural Capital Award 2018 under the Eco-Campus category, and a 5-star Green Rating for Integrated Habitat Assessment (GRIHA) Large Development (LD) rating for implementation of Phase 1A constructions in 2018.



Policies relating to becoming carbon neutral by 2050 may not yet be finalised, but an effort towards carbon neutrality can be seen in their implemented plan to measure water and carbon footprints, energy efficiency and energy generation and zero discharge of wastewater to reduce carbon footprints at the campus level. Since it is a relatively new campus, the risk management plan to mitigate climate impacts has been integrated into the campus development master plan and design.

The institute offers several courses in the areas of environment and sustainability, covering such subjects as energy efficiency, environment and society, water quality, and biodiversity conservation, which are offered in the disciplines of Earth Sciences, Humanities and Social Sciences (including Archaeology), Mechanical Engineering and Civil Engineering. A minor in sustainability is proposed. The institute also conducts workshops and short courses focused on sustainability. These are aimed at providing a knowledge-sharing platform to initiate and strengthen research networking as well as explore the possibility of joint research projects and training in the area to help society with sustainable solutions.

Community outreach and engagement are important facets of IITGN policy. Many of its outreach programmes are undertaken by Nurture & Empower Entrepreneurial Ventures (NEEV) and Nyasa (meaning 'trust' in Sanskrit) on the campus. NEEV also provided product-specific training, and then facilitated livelihood opportunities through bulk orders for products such as cloth bags, curtains, stoles and laptop bags. Between April-July 2020, 18 women have been trained and mentored to make reusable cloth masks. Nyasa instituted a community teaching programme, called Chetana, under which the faculty, staff, and students of IITGN came together to conduct regular teaching sessions for construction worker's children. Efforts are taken to spread awareness among young minds on environmental issues by celebrating World Environment Day through - tree plantation drive. Under the Nyasa Challenge, groups of students cleaned areas within and nearby IITGN.

The Kiran C Patel Centre for Sustainable Development has the single largest faculty research cluster

at IITGN. During the past two years, IITGN faculty have published nearly 100 papers and undertaken 40 projects, including sponsored research projects, consultancy and internally funded projects, related to the field of sustainability and climate change. Some of the research labs at IITGN including the Machine Intelligence and Resilience Laboratory and Water Energetics Lab that are researching in the field of sustainability and climate change. The Machine Intelligence and Resilience Laboratory is an interdisciplinary lab working on the various aspects of climate change and variability, climate extremes, and resilience of built and natural systems. The Water Energetics Lab focuses on modelling and experimental testing of energy-efficient desalination and water treatment technologies towards drinking water production and industrial effluent recycling.

The Director emphasized that:

*The major drivers for investing in climate change and sustainability at IITGN are the increasing awareness of the disruptive consequences and threats posed to civilization by climate and the desire to preserve the earth for the benefit of future generations. At IITGN, a sense of ownership of the institute and involvement of the community in conceptualising, introducing and executing sustainability initiatives has been impactful. As a result, we have an emotional investment in the successful implementation of sustainability initiatives. Besides, the various government policies, reforms and incentives are also a major driver to invest in climate action and sustainability.*

Although universities around the world are aiming to reduce carbon footprints through investment and divestment policies, IITGN has not yet taken any action in this area.

The Director also stated that:

*Some of the main barriers that hinder efforts are lack of awareness, reluctance to face the severity of the environmental crisis, a lack of realisation of the radical lifestyle changes required to mitigate the crisis, and an implicit faith that technology is the best way to undo the damages that*



*technology has wrought.*

At IITGN, during the campus design and development process, minimal barriers were encountered in implementing climate action and sustainability initiatives. However, a few restrictions, for instance, the regulation by Gujarat State Electricity Regulatory Commission related to solar energy that the maximum rooftop solar PV system capacity to be installed at any eligible consumer's premises shall be up to a maximum of 50% of consumer's sanctioned load/contract demand limited the targets set by the Institute (GERC, 2016).

The topography of the land is also an important factor. For example, IITGN faced limitations (in terms of land available, and the type of suitable construction) at the conceptualisation stage of the master plan as the site is located near the riverbank. The riverbank and ravine landscape were protected and conserved as an inseparable part of the development process. The climate change and sustainability strengths of the Institute are grounded in the success of the campus master plan.

### **Pondicherry University (PU)**

Pondicherry University (PU) is a public Central University spread across an area of 780 acres facing the Bay of Bengal. PU is accredited with 'A' Grade by NAAC, and first in the country to implement a 'Choice-Based Credit System' (CBCS) which is now being followed by many other universities. The university has 15 Schools, 38 Departments, 12 Centres and 1 Chair offering over 144 PG, PG-Diploma/ certificate and research programmes with a student strength of over 6557 including foreign students. With around 328 teaching and 487 non-teaching staff, currently, the university has more than 125 funded research projects including SAP & FIST Projects from various agencies like UGC, DST, CSIR and DBT (PU, n.d.). The Internal Quality Assurance Cell (IQAC) of Pondicherry University was established in the year 1996 to promote quality enhancement of all aspects of university functioning.

The university also has two off-campus, one located in Port Blair (Andamans) with two departments viz., Ocean Studies & Marine Biology, and Coastal

Disaster Management and another Post-Graduate Centre at Karaikal. The Directorate of Distance Education focuses on making quality education accessible to all, by adopting information and communication technology to reach the larger segment of people who could not pursue the on-campus model. At present, 93 colleges offering various courses in Arts & Science, Education, Law, Dental, Medical & Para-Medical, Veterinary and Engineering are affiliated to Pondicherry University.

The university recently signed MoUs with prestigious institutions like National Chin-Yi University, Taiwan; National Chung Cheng University, Taiwan; Chungbuk National University, Korea; University of Toulon, France; Zhaw Zurich University of Applied Sciences, Switzerland and University of East Paris, France. PU ranked 9th in the NIRF Central University Ranking 2020 and 58th in the Top universities ranking in India 2020. Besides, PU ascended to the 101-200 rank category, for multiple SDGs by the Times Higher Education University Impact Ranking 2018 & 2019.

According to the Vice-Chancellor:

*Sustainability and climate change are considered very important to the university's work, as it aims to shape future leaders by inculcating an environmental consciousness in the context of policies, values and practices. One of the first developments that we undertook at PU towards sustainability was the onset of the Green Campus concept for the development of sustainable action-oriented policies.*

Sustainable strategies adopted at PU include preparation of a detailed report on the conversion of the PU Silver Jubilee campus into a solar campus (2012), installation of solar street lights, installation of solar water heaters in hostels and kitchens for steam cooking, free bicycles for students and battery-powered public transportation, installation of photovoltaic panels, installation of a water treatment system integrated with constructed wetlands, afforestation, setting up multiple rainwater recharge pits and initiating online administrative and student-centric activities to reduce the carbon and ecological footprints.



As a symbolic commitment to inspire and develop sustainability-related skills among students and scholars, Pondicherry University has:

- signed the ‘Talloires Declaration’, and developed multilevel strategies to fulfil the Declaration’s ‘ten-point action plan’ in association with ULSF, USA.
- set up rainwater recharge pits without disturbing the natural rainwater drainage channels.
- signed an MOU with the CSIR-Centre for Mathematical Modelling and Computer Simulation (C-MMACS), Bangalore, India for setting up a CO<sub>2</sub> monitoring station.
- Registered for ‘Sustainability Literacy Test’ to test the level of sustainability awareness, with SuliTestOrg, France.

The Vice-Chancellor stated that:

*Pondicherry University faculties are involved in several national and international networks on sustainability and climate change. They have also actively participated in several programmes initiated by the Government of India and Regional Government and has received several recognitions and awards in the area of sustainability.*

In association with multiple reputed organizations and NGO, the university plays an active role with the recently launched climate change adaptation programs: ‘Fauna Protection and Conservation Network’ (UN Decade on Biodiversity - 2020), ‘Pollution Prevention, Topsoil Ecology & Ecosystem Restoration, for Soil Sustenance and Organic Food Production networks’ (UN FAO - Global Soil Partnership), ‘Green Campus Initiative’ (Top-Down Approach); Lab-to-land environment education and action research (Attitude change - Transformation); International Cooperation for Wetlands Restoration and Conservation; Schools and Villages adoption program; and periodical Coastal Clean-ups.

According to the Vice-Chancellor:

*The PU’s role in the development of the region’s first climate change policy document – ‘Comprehensive Green Protocol’, as a set of*

*non-negotiable and/or standard operating procedures where environmentally responsible practices, education and research go hand in hand, resulted in creating a healthy environment not only for the university but also for the affiliated institutions and the communities as a whole.*

The protocol provides guidelines on the sustainable management of water resources; soil conservation and sustainable food production; clean air; energy conservation; sustainable use of natural resources; sustainable management of waste resources; and collaboration for sustainability (CGP, 2018). It is also deeply rooted with the missions stated in the National and State Action Plan on Climate Change.

To engage the student community and to involve the campus communities, the university initiated a volunteer drive programme to implement a holistic and student-centred on-campus outreach programme related to climate change and sustainable development (Muthu et al., 2015). This includes projects such as implementing an integrated organic kitchen waste management for campus sustainability (Nandhivarman et al., 2012), implementing an energy recovering strategy from food wastes (Nandhivarman et al., 2015), building constructed wetlands for the treatment of greywater in campus premises (Edwin et al., 2015), developing Pondicherry University silver jubilee campus as a ‘solar campus’ (Boruah et al., 2015), implementing an end to end solid waste management, adopting efficient water management and reuse strategies (Edwin et al., 2012), and organizing a green business ideas pitch and bootcamp (Climate-Launchpad, 2019).

Different wings of the university administration are responsible for campus operations related to sustainability. Fostering the guidelines of government agencies, state compliances, national missions and international targets, the Office of Green Campus (OGC) was set up with the efforts of university leaders and alumni of the Department of Ecology and Environmental Sciences. The OGC establishes policies and control methods as per the Green Protocol, the State and Central Governments Alerts, and the University Grants Commission Recommendations. It also offers advice and strategic assistance to the different sectors



to streamline and implement sustainable policies. Furthermore, it advises the university on all environment-related legal proceedings. Recent outcomes of OGC include community outreach through awareness programmes and capacity building, guidance on sanitary waste wrapping and disposal, call for volunteers, student-centered cotton carry bags drive and more. With the assistance of the administrative, research, and institutional wings and the OGC, the university has aligned its current work and other programmes with the Sustainable Development Goals (SDGs). According to the THE University Impact Ranking, PU has done relatively well on the SDGs: Goal 5 (Gender equality), Goal 12 (Responsible production and consumption), Goal 13 (Climate Action) and Goal 17 (Partnerships for Goals) with an ascension to 101-200 ranking category (2018 & 2019).

Moreover, the ongoing initiatives such as the installation of photovoltaic on roof tops for electricity to feed the main campus without using the national electricity grid, energy projects to generate biogas/renewable energy from campus organic waste, water treatment plants integrated with constructed wetlands, and a mass green cover drive to act as a campus carbon sink are expected to foster the carbon neutrality 2050 agenda.

The curriculum on environmental studies is mandated for the students, and the choice-based credits systems of the university offer multidisciplinary courses on environmental sciences, where a special emphasis is given to climate change and sustainable development.

On the major drivers and barriers faced by the PU, the Vice-Chancellor stated:

*The main drivers at the campus to invest in climate action and sustainability initiatives include international and national rankings, awards, influences, standards, environmental certification, marketing of good practices, consistent local and national legislations and associated penalties, the initiatives of the academic faculties and administrative staff, and more importantly support from the university leaders, collaboration and partnerships. On the other hand, barriers include*

*a lack of awareness and motivation, academic load, time constraints, lack of funding and lack of collaborative spirit between faculties and the departments.*

When compared to other institutions in India, the Vice-Chancellor also stressed that:

*Pondicherry University was one of the first in the country to introduce the “Choice-Based Credit System” (CBCS), which is now being followed by many other Universities.*

PU also integrated environmental science-related courses in Humanities and the Sciences and promoted interdisciplinary studies and research in the field of climate change and sustainability. While PU strives to be financially able to put in place effective measures for climate change adaptation and includes sustainable development in the vision and mission statement of the university, the institution has been one of the most successful in the region for the establishment of the Office of Green Campus, green cover development, and sustainable waste management practises in compliance with notifications/rules/acts of the government and global goals. The challenges faced by the university in realising its goals are not only financial but also include: frequent weather events in the region such as storms, flooding, saltwater intrusion and drought that are increasing in magnitude and frequency.

### **Challenges and Opportunities: The Way Forward**

While sustainability and climate change are deemed central to both PU and IITGN, the two campuses have different viewpoints on the grand challenges of climate change and sustainability. IITGN, on one hand, has emphasised sustainability across the campus with a special focus on water conservation, purification, recycling, comprehensive waste management, compost production, low energy and resource consumption and solar energy generation with internal targets towards becoming a carbon-neutral, zero discharge campus. PU on the other hand stressed its commitment to the Comprehensive Green Protocol adopted by the University with specific carbon



reduction targets directly through solar power generation, water resource management, soil conservation, clean air through a plantation drive and indirectly through waste resource management, sustainable use of natural resources, and procurement. Besides, PU significantly partnered with national/ international organizations, NGOs and industries to further its climate commitment.

Both institutes have a dedicated Green Office to oversee and coordinate tasks related to climate change and sustainability. However, as IITGN is one of the premier institutes in the country, it is better placed when it comes to securing funds and allocating budgets for tackling climate and sustainability issues and undertaking community outreach and engagement through tailored programmes.

It was also observed that PU had better gender equality (around 42% women) among the students enrolled compared to IITGN (around 20%). Gender inequality is a common phenomenon especially with the core technical institutions such as the IITs. This ratio at IIT has improved compared to the recent past when it was around 8-10% and this was possible mainly because of the enforcement of a reservation through the addition of supernumerary seats for women. With gender equality being one of the 17 SDGs (Goal 5), empowering women and promoting gender equality is not only a basic human right but also crucial in ensuring an all-around sustainable development, ending all forms of discrimination against certain sections of the society.

The major drivers for investing in climate change and sustainability at IITGN were the government policies, reforms, incentives and most importantly the emotional involvement of the campus community and increasing awareness of the disruptive consequences of climate change and the desire to preserve the earth for the benefit of future generations. On the other hand, the drivers for PU include international and national rankings, awards, standards, environmental certification, marketing of good practices, consistent local and national legislations and associated penalties, the initiatives of the academic faculties and administrative staff, support from the university leaders, collaboration and partnerships.

The main barriers that hinder the efforts at IITGN are a lack of awareness, reluctance to face the severity of the environmental crisis, a lack of realisation of the need for a paradigm shift in lifestyle changes, an implicit faith that technology is the best way to undo the damages that technology has wrought and some hurdles posed by the nature of the topology being on the riverbank and restricting regulations on adopting solar. The barriers for PU include a lack of awareness and motivation, academic load, time constraints, lack of funding and lack of collaborative spirit between faculties and the departments.

Some of the unique facets of IITGN have been its efficient operational monitoring that measures the impact of policies and actions taken, a consultative and participatory process with all stakeholders and its annual fair and seminar dedicated to sustainability. PU was one of the first HEIs in the country to introduce the 'Choice-Based Credit System' (CBCS) and to launch a 'comprehensive green protocol' (climate change policy), which is now adopted by many other universities, and also it has a notable commitment to interdisciplinary research on sustainability. IITGN is on the riverbank and PU is on the coast of Bay of Bengal, and so both have their inevitable challenges with respect to maintaining the sensitive ecosystem surrounding their campuses.

International pressure to participate and show climate action has been a key factor in encouraging climate action worldwide. Many nations are creating climate action plans as part of these wider mitigation initiatives to consider how to reduce their greenhouse gas emissions. India carried out national climate change plans in preparation for the Copenhagen COP, which encompassed both climate protection and adaptation (Dubash, 2020). In almost all cases, these pressures were mediated by national politics, which involved the creation of coherent national narratives. In India, the construction of a co-benefit narrative proved politically important to unlock what had previously been an equity-only construction of climate politics. The higher education community is showing ever more commitment to climate action because of the national action plans, and HEI leaders are committed to teaching and encouraging, engaging and reporting information on climate action at the campus level.



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