



SDG 12: Responsible Consumption and Production

ENSURE SUSTAINABLE CONSUMPTION AND PRODUCTION PATTERNS

The institute promotes sustainability efforts on campus as well as in neighbouring villages, focusing on water and waste management, compost production, and awareness programmes. The institute has a dedicated Green Office, which plays a pivotal role in monitoring and implementation of various efforts related to green campus. It promotes policies related to sustainability and aids in steering sustainable development practices, including inculcating behavioural changes and increased awareness amongst the community members. The institute works towards creating better awareness and implementing various activities that contribute to eco-friendly and sustainable practices on the campus and in neighbourhood villages.

Research

Considerable research ongoing at the institute highlights the importance of sustainable consumption and production. Nearly 10 researchers at the institute work in these areas including, but not limited to life cycle analysis, plastic degradation, and organic waste management. A list of related research and consultancy projects ongoing at the institute with the corresponding funding agencies is provided below.

- Sewage Disposal and Management at High Altitude Areas; Army Technology Board
- Generating useful products through human waste processing; ReMaterials
- Regression Analysis for Sewage Treatment Plant Civil Works, Project Facilities, and EMI; Dholera Industrial City Development Limited
- Multi-effect membrane distillation for modular desalination and brine concentration; Science and Engineering Research Board
- Brine splitting for energy efficient textile dyeing effluent reuse; Department of Science and Technology
- Advanced nanotracers for product life cycle assessment and product monitoring; Ministry of Education
- Development of environmentally and economically sustainable composite solution for municipal solid waste management; Ministry of Education

Some of the startups supported by the institute are also working towards this goal. InfyU Labs, an agritech company with IoT based products for quality assurance of fruits and vegetables, has developed a non-invasive hand held device. The results, based on the principles of spectroscopy and deep learning

algorithms, quantify chemical composition of fruits and vegetables and lead to food wastage reduction. Stakeholders such as quality managers, food processing retailers, marketers, etc. in the food safety and supply chain are benefitted. The startup was declared the national winner of Youth Co:Lab, a programme launched in India in 2019 by the United Nations Development Programme (UNDP) and Atal Innovation Mission. Pre-incubated at IIEC and supported under the Nidhi Prayas programme, it has raised Rs 1.8 crores in a seed round from Indian Angel Network (IAN).

Krsikx, an agritech startup has introduced a tent-based self-reliant, cost-effective, portable preservative, which may be used by smallholder farmers, logistics managers, etc. to extend shelf life of fruits and vegetables. The benefits include non-cooling technology, maintenance free, powered by solar panel, simple and robust system, portability and remote monitoring of the system. The focus is on enhancing the accessibility of cold storage systems for farmers and enhancing the food value chain towards sustainable, lower wastage and developing an ecosystem of eco-friendly processes. The startup was selected by the Ministry of Youth Affairs and Sports for a felicitation programme organised for the youth of India who had done phenomenal work in 2017-2021 and was one among 32 awardees from all over India. It was also selected among the top 10 entries by the UNDP for the best concept of building a better system to enhance the food processing industry.

Education

Following courses are offered at the institute relating to responsible consumption and production:

CE 202: Sustainability and Environment

CL 627: Particulate solids - Processing & surface engineering

DES 302: Creativity, Design and Doing

ES 201: Introduction to Design and Innovation

ES 202: Introduction to Materials

ES 203: Digital Systems

MSE 305: Advanced Materials

MSE 621: Process Plant Design: How to setup a process industry

MSE 626: Light Metal Alloys for Automotive Industry

MSE 628: Advanced Engineering Materials

SC 266: Chemical Processes A

The institute organised the following workshops:

- Chemical Processes by Dr Subhash Deodhar, Senior Consultant, Fisher International, USA, from October 26 to December 4, 2020.
- Natural Dye Workshop by Mr Nirav Patel, Designer, Design and Innovation Centre (DIC), IITGN, on February 20, 2021.
- Nature-Inspired Design, Mr Sanjay Jain, Professor, SAGE Institute of Design, 2 hours/ week during March 20 to April 24, 2021.

Community Outreach

With an aim to illuminate Diwali with environment-friendly self-made decorations that also teaches some lessons of Mathematics, the Centre for Creative Learning (CCL) at IITGN launched a '20-20 lamps'

series. As a part of this video series, which was launched on the day of Dussehra and continued for 20 days up to Diwali, every day, the CCL team released a video on its YouTube channel on how to make a new paper lamp that is based on one of the Mathematical concepts. These lamps not only facilitated learning but also enabled family bonding, in the difficult times of covid. The material required to make these lamps is minimal, only chart paper and glue/lahi/stapler. There is no use of plastic, so it encourages celebrating the festivals with environment-friendly decorations. Prof Manish Jain, Coordinator of the Centre stated that the initiative takes forward the ideas of ‘Vocal for Local’ and ‘Make in India’.

As a part of the Swachata hi Seva campaign and Swachhata Pakhwada, IITGN guided its neighbouring villages to take up progressive initiatives relating to solid waste management in their vicinity. The villagers were educated about wet and dry waste, hazards of plastic waste, and the importance of cleanliness through posters and live demo activities of waste segregation. The members of the IITGN SWM team also oriented the school and village’s cleanliness workers about waste segregation practices and awareness messages have been put up outside shops to discourage the use of plastic bags.

Operations

A series of emails were circulated within the Institute urging everyone to properly segregate the waste (into biodegradable, recyclable, sanitary, and everything else) from their places before handing them over to the workers during the pandemic. As a result, people have been extremely careful and this activity has been helpful to the waste collection and management team.

Continuing its commitment to ensuring food safety and promoting healthy eating, IITGN has bagged the Eat Right Campus Award with a five-star rating from the Food Safety and Standards Authority of India (FSSAI) for the second consecutive year. This time FSSAI has certified IITGN as the ‘Eat Right Campus’ with five-star rating for a period of two years, i.e. up to August 14, 2022; after third-party auditing by DNV GL Business Assurance India Pvt Ltd (DNVGL). The audit is done based on a checklist of following five parameters: a) Compliance with food safety and hygiene; b) Healthy diets; c) Food waste management; d) Promotion of local and seasonal foods on campus; and e) Promotion and awareness on food safety and healthy diets in and around campus.

The institute has taken the following initiatives for efficient solid waste management on the campus:

- The waste generated at the institute is segregated into organic, recyclable, medical and chemical waste and waste that is to be sent to landfill. The chemical waste of the labs at IITGN are collected by an external agency. Waste from the campus is collected by Gandhinagar Municipal Corporation every two days to be taken to the landfill.
- Any new resident of the campus is provided with the waste segregation guidelines, which are to be strictly adhered to. It is to be noted that we have been following the well laid-out guidelines for waste management.
- Absolutely zero use of plastic cups or cutlery at meetings, public events or canteens. There is a very restricted use of packaged water bottles. Appeals are made to the community for minimising the use of other plastics.
- Mess and canteen contractors, for instance, have been instructed not to use plastic disposable items and to minimise other disposable items. On that basis, the institute has also received the Eat

Right Campus award, which indicates that the guidelines are not only followed at the receiver's end but also at the suppliers end of services.

- As part of IITGN's waste management initiatives and to minimise waste going to the landfill, the campus built a biogas plant to process the wet food waste (coming primarily from the hostel mess). This biogas plant, based on technology developed by the Mumbai-based Bhabha Atomic Research Centre (BARC), generates electricity from organic waste and slurry, with no other by-products. However, as the biogas plant has not been running as reliably as hoped, campus planners are now more reliant on the composting pits.
- Green, blue and red bins have been placed throughout the campus, including the hostels, academic buildings and housing areas.
- Only reusable bottles, glasses, cutlery and plates are used in the tea stalls and at meetings and conferences, etc. IITGN community members are consistently encouraged to minimise the use of plastic and disposable items.
- The community members are reminded of proper segregation of waste (dos and don'ts), maintaining cleanliness on campus, principles of 'Swachh Bharat Abhiyan', use of eco-bags instead of plastic bags, reducing the gap between what we need and what we buy/use, collection of e-waste, the environmental impact of food waste, etc.
- The institute's Green Office is actively involved in waste reduction initiatives and generates awareness among the IITGN members and nearby village communities.

The institute publishes a Sustainability Report on an annual basis, highlighting our research and activities related to the five focus areas as follows: water, pollution and waste management, climate change, energy, natural resources, wildlife and ecosystems.

Waste generated and recycled across the whole university is measured. Statistics of the year 2020-21 is provided below:

Proportion of waste recycled: 98.32%

Amount of waste generated: 322.1 tonnes

Amount of waste recycled: 316.7 tonnes

Amount of waste sent to landfill: 5.4 tonnes