



SDG 12: RESPONSIBLE CONSUMPTION AND PRODUCTION

ENSURE SUSTAINABLE CONSUMPTION AND PRODUCTION PATTERNS

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. It encourages various sustainability efforts, focusing particularly on water and waste management, compost production, and awareness programmes (on campus as well as in neighbouring villages). 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 and practices related to sustainability on the campus and in the neighbouring villages. It aids in steering sustainable development practices, inculcating behavioural changes and contributing to increased awareness amongst the community members of IITGN and in nearby villages.

Research

Considerable research work at the institute focuses on the maximisation of sustainable consumption and production. One of the research projects is on Sewage Disposal and Management at High Altitude Areas supported by Army

Technology Board. Some of the startups supported by the institute are also working towards this goal, details of which are mentioned below.

InfyU Labs, an agritech company with IoT based products for quality assurance of fruits and vegetables. It has developed a non-invasive hand held device, based on the principles of spectroscopy and AI algorithms to quantify chemical composition of fruits and vegetables. The organisation provides accurate results using powerful deep learning algorithms, to benefit stakeholders such as quality managers, food processing retailers, marketers, etc. in the food safety and supply chain, resulting in a significant reduction in food wastage. The device aids in prediction of shelf life of commodities, which is beneficial from a consumer's point of view. It was the national winner of Youth Co:Lab, a programme launched in India in 2019 by UNDP and Atal Innovation Mission, with a focus on specific SDGs.

Krsikx, an agritech startup focuses on enhancing the accessibility of cold storage systems for farmers. Generally, a large proportion of cold storage systems are stagnant or immovable and farmers are forced to travel several kilometres to store their perishable produce, thus also increasing the cost price of the items. Fruits and vegetables also tend to get wasted in the process due to mismanagement in handling, sorting, etc. The startup has introduced a tent based self-reliant, cost-effective, portable preservator, 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. Thus, this startup strives to enhance 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. Kriskx was one among 32 awardees from all over India. It was also selected among the top 10 entries by the United Nations Development Programme for the best concept of building a better system to enhance the food processing industry, consisting of the cycle of fruits being plucked from the plants till it reaches the end consumer.

Operations

IITGN has been ranked among India's cleanest universities by the Ministry of Human Resource and Development at the third Swachhata Ranking Award ceremony in Delhi. The institute was ranked fourth in the category of 'Residential University – AICTE' in MHRD's annual Swachh Campus Ranking 2019 for Higher Educational Institutions. The Swachh Campus rankings evaluate higher-education institutions on a wide range of hygiene and environmental parameters such as student-toilet ratio, hostel, and residential cleanliness, waste disposal, water harvesting and conservation, renewable energy use, campus greenery, etc.

The chemical waste of the labs at IITGN are collected by Bharuch Enviro Infrastructure Limited, GIDC, Ankleshwar. The waste generated at the institute is segregated into organic, recyclable, medical and chemical waste and waste that is to be sent to landfill. Further, the organic waste is composted, and other types of waste are sent to the respective agencies for further processing. 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.

Waste from the campus is collected by Gandhinagar Municipal Corporation every two days to be taken to the landfill. 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.

The concerned outsourced suppliers have also been instructed not to use plastic disposable items and to minimise other disposable items.

The institute practises reduction and segregation of waste at the source, as well as the appropriate collection, storage, treatment and disposal on campus. The recyclable waste of materials like glass, plastic, metal, paper and e-waste is transferred to regional/commercial recycling centres certified by Gujarat Pollution Control Board/ Central Pollution Control Board. The fundamental concept of waste management "Reduce, Reuse and Recycle" is implemented: sustainable waste management is practised by optimising the amount of waste recycled or composted so as to minimise waste sent to dumping in landfills.

The amount of waste sent to landfills and recycling centres is measured and documented on a monthly basis. 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.

Waste disposal of hazardous materials is carefully handled, including the collection of the chemical waste of the labs by a designated agency. Green, blue and red bins have been placed throughout the campus, including the hostels, academic buildings and housing areas. Specific locations have bins of other colours (yellow and black) meant to collect specific kinds of waste.

Diverting waste from the landfill requires a significant educational shift on the part of the entire campus community. 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.

IITGN community members are encouraged through constant appeals to minimise the use of plastic and disposable items. Also, communications are provided to the community members for 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. An external waste management consultant assists the campus in managing the entire solid waste management programme, through regular training of staff, monitoring the implementation of various initiatives and providing general education to the campus community on the need for and benefits of waste reduction.

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. The construction waste generated during the construction phase is used on-site for filling up designated isolated pockets of land within the site.

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 2019-20 is provided below:

Proportion of waste recycled: 87%

Amount of waste generated: 350 tonnes

Amount of waste recycled: 305 tonnes

Amount of waste sent to landfill: 40 tonnes

Biomedical waste (sent to concerned agency): 5 tonnes

Education

Following courses are offered at the institute relating to

responsible consumption and production:

CE 202: Sustainability and Environment

CE 601: Advanced Geotechnical Engineering

CE 629: Geosynthetics

CL 425: Process synthesis and design

CL 627: Particulate solids - Processing & surface engineering

DES 302: Creativity, Design and Doing

ES 201: Introduction to Design and Innovation

ES 632: Energy Systems

FP 100: Foundation Programme

IN 202: Engineering and Democracy: An Indian Imperative

IN 304: Ancient Indian Technology

MSE 305: Advanced Materials

MSE 626: Light Metal Alloys for Automotive Industry

MSE 628: Advanced Engineering Materials

Community outreach

IITGN has always taken the lead when it comes to helping and guiding its neighbouring villages to take up progressive initiatives in their vicinity. Continuing its legacy, the institute extended handholding support to the villagers of the Basan village and helped them take steps towards cleanliness, under the Swachata hi Seva campaign.

The villagers were educated about Solid Waste Management (SWM), 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.

Besides, the IITGN SWM team also put up pictorial awareness posters about waste segregation in major public spots in the entire village to reinforce the message in the minds of the villagers. The institute also donated wet and dry waste dustbins to primary school to help inculcate waste segregation practice in young minds. They installed clean and recycled lab material containers as dustbins outside most of the shops in the village and motivated the shopkeepers to encourage villagers to use those dustbins. The waste from there is later collected by the waste collection vans.