



Centurion
UNIVERSITY

*Shaping Lives...
Empowering Communities...*

SDG 12 | Report on Responsible Consumption and Production

SDG 12

REPORT 2021



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I. Targets



Responsible Energy Consumption

Centurion University makes effort towards responsible consumption of energy. It has an inhouse and indigenously built, 32 kilowatt solar micro grid which suffices the need of market complex. The University has set targets to reach 60 kilowatt production by 2023. It also strives to install another 50 kilowatt by 2024



Mobility and Being Carbon Neutral

Centurion University makes efforts towards E-mobility solutions. In the year 2021, 141 e-vehicles were manufactured and the University targets to manufacture another 220 vehicles by the year end.



Food Waste to Compost

Centurion University endeavours to abstain from wastage of food on campus. However, being a semi-residential University with centralised and decentralised eateries there is always certain amount of food wastage on campus. In the year 2021 there was a total wastage of 622 kg of food wastage. It has reduced by 27.8% in the year 2022. The University targets to further slash it down by 30% by 2023.



Genetic Engineering Interventions

Centurion University experiments with speed breeding techniques using Genetic Engineering. It has procreated different different species of plants and a low glycemic index rice called "RnR". The University has target to extend Genomic Service to outside client base by 2023.



II. The Context of Centurion University

Centurion University of Technology and Management being one of the leading Skill Universities of India is well known for its own kind of eco-system to integrate and promote skills in higher education system. Being a Center of Excellence (CoE) for Skilling of Ministry of Skill Development and Entrepreneurship (MSDE), multiple experiments to design an integrated and inclusive ecosystem for skill development and entrepreneurship has always been the priority. The main mantra of the University is “CARE...”, the University, “Shapes lives and Empowers Communities” through “We CARE”. This is achieved through concept of differentiator, “Teaching, Training, Production, Productivity, Product”. Responsible Sustainable Consumption is where the University stands out. It strives to minimize the food wastage, harness green energy and Recycle and Reuse waste water in relevant activities. Reduce, Recycle and Reuse is found at the core of the University’s principles like adhering to Plastic Waste Management Rules, there is zero tolerance against usage of single use plastics. Thereafter, all the multiuse plastics are processed to manufacture paver blocks. Likewise, waste water from campus is recirculated to all botanical fields and agricultural plantations. All the production centers of the University also adhere to relevant rules like Solid Waste Management Rules, Basel Conventions and Hazardous Waste Management Rules. The capacity of the students is built up through Domain specific – Industry linked program structure with extensive exposure to applied learning through Industry internship. Research in the University has resulted in development a variety of rice with low Glucagon called as “DiaFit” which is suitable both for diabetes patients. Almost all University’s daily need either fully or partially are in house produced, for example all chairs, benches, chalks, eco-friendly disinfectants and edible items are produced within the University. Similarly, there is a zero tolerance for Substance Usage within the campus. The University’s all of its campuses have zero-tolerance to this and it regularly conducts awareness campaigns on the same.

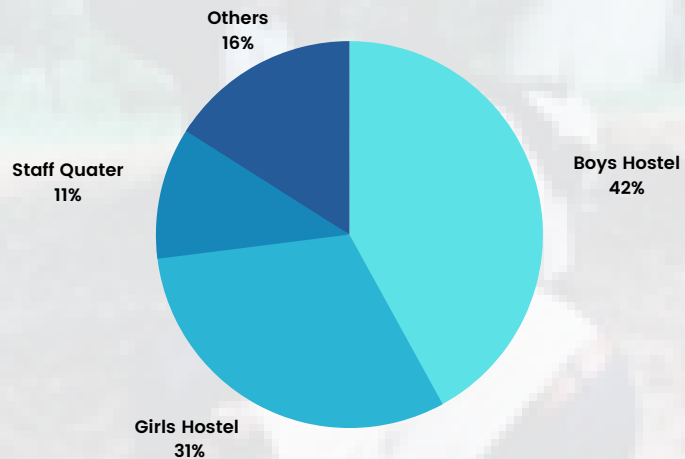
Jagannath Padhi
Director,
Centurion University



1. Introduction

1.1. The Campus and Water

Water is used extensively in the University's campus for various purposes. It uses a total of 2,82,000 Liters/day, Water is used for various purposes and certainly there is a wastage as well. In order to make the waste water usable the University had designed and constructed its own Sewage Treatment Tank (STP) inside the campus.



One of the cardinal rationale of waste water treatment through STP is its usage in the University's garden which is 172945.40 m and 2162 number of planted trees. The maintenance of the garden necessitates large quantity of water. The treated water from STP is used for the purpose of gardening and farming besides other applications.

1.2. Sewage Treatment Plant

Owing to the increase in pollution, the quality of water has become a top priority for the people. Hence wastewater, especially domestic sewage, needs to be decontaminated. In the past, domestic waste water treatment was mainly confined to organic carbon removal. Recently, increasing pollution in the wastewater leads to developing and implementing new treatment techniques to control Nitrogen and other priority pollutants. Pollution in its broadest sense includes all changes that curtail natural utility and exert deleterious effect on life.

The crisis triggered by the rapidly growing population and industrialization with the resultant degradation of the environment causes a great threat to the quality of life. Degradation of water quality is the unfavorable alteration of the physical, chemical and biological properties of water that prevents domestic, commercial, industrial, agricultural, recreational and other beneficial uses of the same. Sewage and sewage effluents are the major sources of water pollution. Sewage is mainly composed of human fecal material, domestic wastes including wash- water and industrial wastes.



Sewage Treatment Plant is a facility designed to receive the waste from domestic, commercial and industrial sources and to remove materials that damage the quality of the water, which in turn compromise public health and safety when discharged into water receiving systems. It includes physical, chemical, and biological processes to remove various contaminants depending on its constituents. Using advanced technology it is now possible to reuse sewage effluent for drinking water.

Objectives:

The principal objective of waste water treatment is generally to allow human and industrial effluents to be disposed of without danger to human health or unacceptable damage to the natural environment. An environmentally-safe fluid waste stream is produced. No danger to human health or unacceptable damage to the natural environment is expected. Sewage includes household waste liquid from toilets, baths, showers, kitchens, sinks and so forth that is disposed of via sewers. Sewage also includes liquid waste from industry and commerce.

Importance of Wastewater Treatment Plant:

The importance of wastewater treatment plants is highlighted looking towards the increasing pollution. Water is treated before going down to drains and before releasing it back into the environment. Wastewater treatment plants have evolved considerably over time. Their first and most important purpose is to clear the water we use in our homes of solid materials. This process of screening and settlement is known as primary treatment. Although this removes the largest debris items, the wastewater is still full of organic material, which doesn't smell great and, if dumped directly into our water bodies, can contaminate them and consume available oxygen as it decomposes.



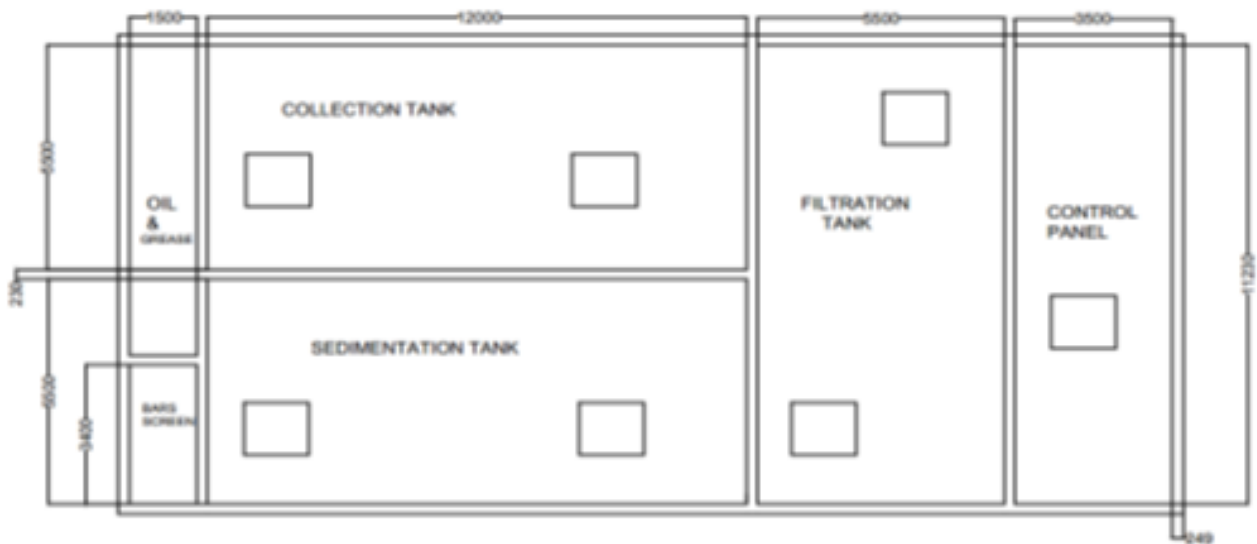
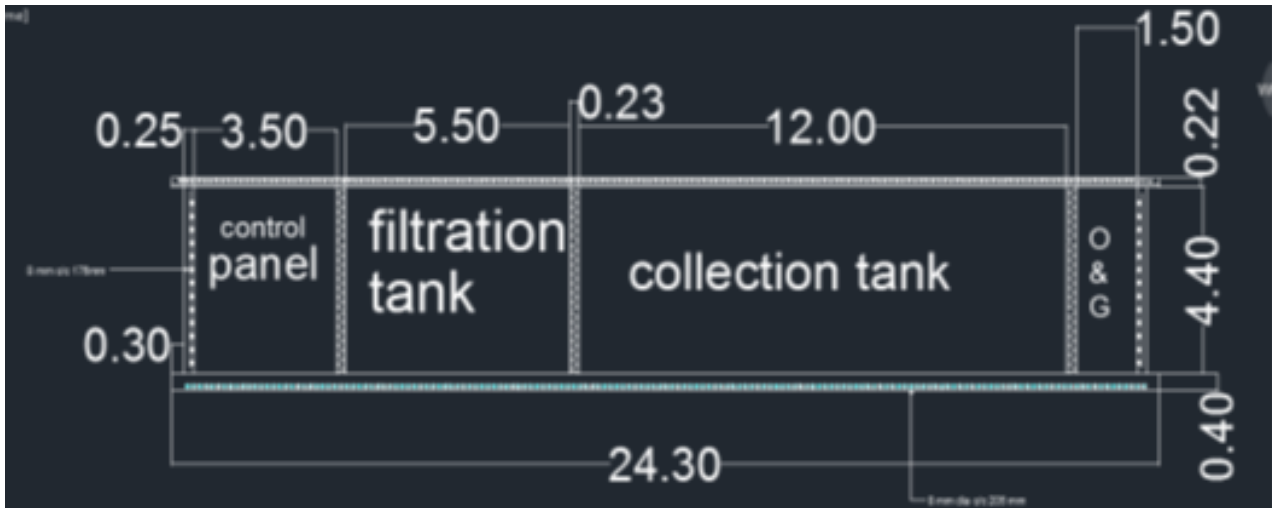
Advantage of Wastewater Treatment:

The advantage of waste water treatment save water and can be used for agriculture, plantation, vegetation, and gardening. This treated water can be used it for curing of bricks and watering while constructing of new buildings. Treated water can be used for toilets and for domestic need of human beings. The treated water can be stored in tanks and use it during the period of water crisis. By the treatment of polluted there will be decrease in the cost of transportation. A lot of ground water, surface runoff and pollute d can be recycled through treatment process and may be use it for the wellbeing of the society.

1. Waste water as it enters into waste water treatment plant is screened to remove large items from the water. The goal of this step is to remove debris that could damage the treatment facility's equipment.
2. The grit from the waste water is removed by forcing the water through a grit chamber. Forcing the waste water quickly through the chamber prevents organic waste from settling and aerates the mix. Small waste water treatment plants may skip grit removal.
3. The screened waste water is pumped into sedimentation tanks to help further separate the components of waste water. Remove and condense the organic matter, called sludge, which settles to h bottom of the tank.
4. The surface of the waste water is skimmed to remove oil, soap scum and grease. Rakes from the top of tanks remove these components of waste water, known collectively as scum.
5. The scum and sludge is collected into a single sludge processing unit for further treatment. Aerobic digestion process of solid waste, and some facilities use the resulting methane gas as a source of energy.
6. The waste water is filtered through sand to remove excess Iron and Calcium, some bacteria and remaining solid particles in the water. Filtering the waste water should also reduce the color and make the water more transparent.
7. The waste water is treated with chlorine to kill remaining bacteria. Chlorine is to be added avoid over contamination; most of the chlorine will break down as it kills the bacteria. Sometimes the chlorinated waste water is treated wastewater is treated with chemicals to neutralize any remaining Chlorine.
8. The cleaned waste water, called effluent is either reused or disposed.

Layout of STP

Centurion University has designed and constructed a Sewage Treatment Plant for treatment of waste water. The plan and capacity of STP is detailed below:



Plant capacity:

- Maximum daily demand = 180 liter/day.
- Average water supply per day = $180 \times 1550 = 279000$ liter = $279 \text{ m}^3/\text{h}$.
- Average sewage generated per day = 85% of supplied water = $0.85 \times 279 = 223 \text{ m}^3/\text{h}$.
- Average sewage generated per hour = $223/24 = 9.29 \text{ m}^3/\text{h}$.
- Peak factor = 3
- Design flow capacity (maximum) = $9.29 \times 3 = 27.85 \text{ m}^3/\text{h}$.

1.3. Rain Water Harvesting

Centurion University strives to conserve rain water through rain water harvesting. One of such endeavour is to transform the natural pit in the campus into a temporary water storage tank. Besides conservation and storage of rain water, it is also getting used for aquaculture and other gardening works. RWH recharges the ground water and it makes the soil puross and arable.



Natural Pit being used for Rain Water Harvesting



Pits made by illegal mining activity which is transformed for waste water treatment and RWH



1.4. Micro Irrigation in Action

Micro Irrigation is defined as the frequent application of small quantities of water on or below the soil surface as drops, tiny streams or miniature spray through emitters or applicators placed along a water delivery line.



Micro Irrigation



2. Responsible Production

2.1. Genetic Engineering Interventions

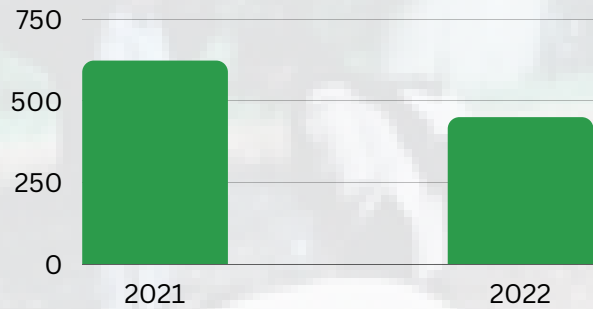
Centurion University endeavors to experiment with the new state of the art technology like Genetic Engineering. It has produced low glycemic index rice "RnR" and makes effort to produce speed breeding plant. The excerpts of endeavor is detailed below:



2.2. Organic Waste to Compost

Centurion University has zero tolerance for the wastage of food. However, there is always certain wastage pertaining to inevitable reasons.

In the year 2021, the total food wastage was 622kg which was reduced by 27.8% in 2022. The University has procured two numbers of food digester units that transform food waste into natural compost.



2.3. Apiculture

The Apiculture unit was established with 25 numbers of boxes with species Indian honeybee, *Apis cerana indica* under careful guidance and supervision.



3. Responsible Consumption

3.1. Sustainable Energy Efficient Campus

Centurion University strives to build up an energy efficient campus through usage of less energy to perform the same task and produce the same result. It is accentuated through regular energy audit which enables to understand the niche areas with scopes of improvements. Thereby, Centurion University relies on usage of star rated energy appliances across its campuses. The University has taken several steps towards decarbonization through energy efficient self-sustaining activities. One of such effort is a DC Solar Micro Grid of Roof Top Solar Installations. DC micro grid with centralized with centralized generation and distributed storage enables electrification of off-grid that have difficulty in accessing the electrical distribution network to meet their energy needs.

Roof top solar PV unit. It is equipped with PV cells which partially meets the electricity need of the campus it supplies electricity to the market complex of the University



Solar Street Light

The University campus is all equipped with solar lighting systems.



3.2. E-Mobility Initiatives

The University Green Initiatives has multifaceted approaches, one such approach is e-mobility. It indigenously manufactures e-vehicles and does technology transfers. One of such transfer is to an entity named "Skyriders" which provides e-mobility solutions and lead by an alumnus student.



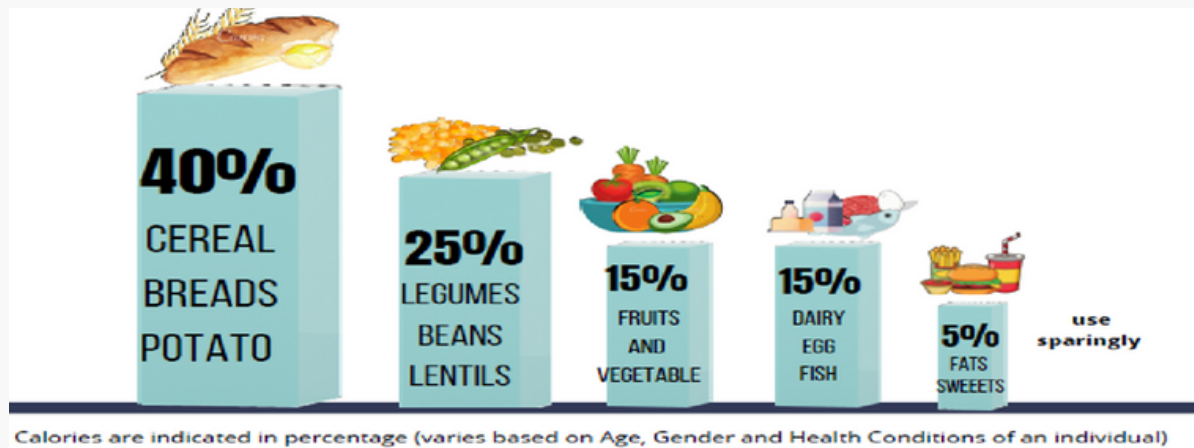
3.3. Good Food Policy

The university has made provisions for meeting the food and nutritional needs of the students based on the calorific recommendations of the Indian Council of Medical Research (ICMR) and Recommended Dietary Allowances (RDA) of various nutrients (carbohydrates, proteins, fats, vitamins, and minerals). A well-balanced diet containing adequate proportions of cereals, pulses, fruits and vegetables, and meat products that supply all the essential nutrients for meeting the requirements is provided. The same is incorporated in the menus across campuses.

DAY	BREAKFAST	LUNCH	SNACKS	DINNER
MONDAY	Upama, Sambar, Matar Curry, Milk, Banana, Tea	Rice, Dal, Mix Veg curry, Paneer Curry, Papad, Pickle	Tea, Alu Chop	Rice, Dalma, Roti, Chips, Sweet, Banana
TUESDAY	Idili, Sambar, Chutney, Milk, Banana, Tea	Rice, Dal, Chicken Curry (NV), Paneer Curry (Veg), Chips, Papad, Pickle	Tea, Ragi laddoo	Rice, Dal, Roti, Rajma, Kheer, Banana
WEDNESDAY	Vada, Matar Curry, Milk, Banana, Tea	Rice, Dal, Fish Curry, Soyabean Curry, Chips, Salad, Pickle	Tea, Pakodi	Rice, Dalma, Roti, Veg Fry, Sweet, Banana
THURSDAY	Poha (Chuda), Matar Curry, Boiled Egg, Milk, Banana, Tea	Rice, Dal, Mashroom Curry, Veg Fry, Papad, Pickle	Tea, Ragi Biscuit	Rice, Dal, Roti, Kabuli Chana curry, Sweet, Banana
FRIDAY	Puri, Alu Curry, Boiled Egg, Milk, Banana, Tea	Rice, Dal, Fish Curry, Mix Veg Curry, Chips, Papad, Pickle	Tea, Bread Chop	Rice, Dal, Roti, Mix Veg curry, Sweet, Banana
SATURDAY	Upama, Sambar, Matar Curry, Milk, Banana, Tea	Rice, Dal, Egg Curry, Potola Curry, Mix Veg Fry, Papad, Pickle	Tea, Alu Chop	Rice, Dal, Roti, Soyabean Curry, Sweet, Banana
SUNDAY	Puri, Alu Dum, Pickle, Milk, Banana, Tea	Rice, Dal, Chicken Curry, Paneer Curry, Mix-Veg Fry, Papad, Pickle	Tea, Samosa	Rice, Dal, Roti, Kabuli Chana curry, Kheer, Banana

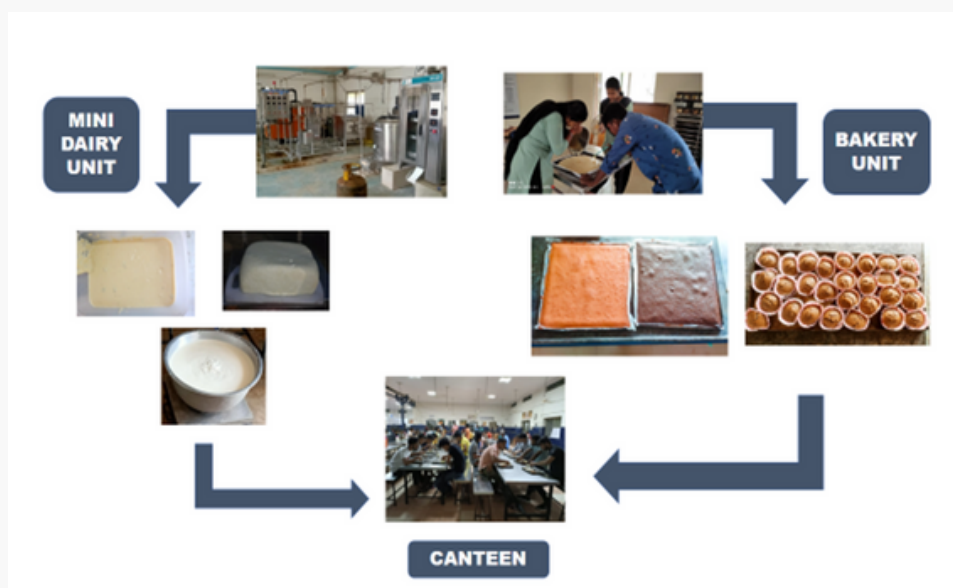
Food Menu (Meets the requirements of ICMR- Calorific recommendations)

The university also ensures that the food's safety, quality, and nutrient composition is monitored and frequently tested by a nutritionist for ensuring adequacy. Right pre-cooking processes and appropriate cooking methods are being followed for providing safe and clean foods. A variety of whole grains, beans, and other legumes are included in the menu for meeting the fiber requirements. The moderate use of edible oils such as butter, vanaspati, and animal foods is followed. Dairy products (milk, yogurt, paneer) are included for meeting the calcium and protein requirements. Preparation and distribution of processed foods rich in salt, sugar, and fats are kept minimal.



Caloric Requirements Based on ICMR Guidelines

Foods rich in micronutrients (iron and calcium) such as ragi laddoo/ragi biscuit/ragi cakes with jaggery, and fermented foods, both dairy (curd/yogurt), and baked (bread/buns) are provided in the form of snacks. The programs undertaken by the management and ensuring food security have also ensured the supply of nutritious food at lower cost, strengthened the most vulnerable sections, indirectly helped in tackling poverty and structural inequalities, and is also promoting a positive impact on human health and the environment.



Food produced and consumed by the students

4. Reduce Recycle Reuse

4.1. Plastic Free Campus

Centurion University commits itself towards a “No Plastic Campus”. Adhering to Plastic Waste Management Rules, all multi use plastics and PET materials are Reused by Upcycling the waste plastics like in development of infrastructure through manufacturing of pavers block.



Plastic Waste Management Rules, 2016

The Plastic Waste Management Rules, 2016 aim to:

- Increase minimum thickness of plastic carry bags from 40 to 50 microns and stipulate minimum thickness of 50 micron for plastic sheets also to facilitate collection and recycle of plastic waste
- Expand the jurisdiction of applicability from the municipal area to rural areas, because plastic has reached rural areas also
- To bring in the responsibilities of producers and generators, both in plastic waste management system and to introduce collect back system of plastic waste by the producers/brand owners, as per extended producers responsibility
- To introduce collection of plastic waste management fee through pre-registration of the producers, importers of plastic carry bags/multilayered packaging and vendors selling the same for establishing the waste management system
- To promote use of plastic waste for road construction as per Indian Road Congress guidelines or energy recovery, or waste to oil etc. for gainful utilization of waste and also address the waste disposal issue; to entrust more responsibility on waste generators, namely payment of user charge as prescribed by local authority, collection and handing over of waste by the institutional generator, event organizers.
- An eco-friendly product, which is a complete substitute of the plastic in all uses, has not been found till date. In the absence of a suitable alternative, it is impractical and undesirable to impose a blanket ban on the use of plastic all over the country. The real challenge is to improve plastic waste management systems.



Bing eco-friendly Centurion University constantly experiments and manufactures biodegradable products like bamboo cups, bottles and cups made-up of coconut shells.



Centurion University with the mantra "Reduce, Reuse, Recycle and Upcycle" transforms the waste plastic in the campus. It uses them as one of the raw materials in the manufacturing of pavers.



Centurion University has zero tolerance for the usage of plastics in adherence to the Plastic Waste Management Rules. There are signages at all the strategic locations of the University.

5. Zero Tolerance to Substance Usage

5.1. Campaigns against substance usage

Centurion University has zero tolerance towards the usage of substances. All of its campuses follow the No Smoking Policy adhering to different legislations of Government of India.



