

Track and measure waste generation and recycling across the university

In 2024, Centurion University **achieved 92.6%** waste recycling and reuse, processing **547.9 tons** of waste out of **591.74 tons generated**, and diverted nearly all biodegradable waste from landfills. Its integrated waste management system avoided approximately **1,450 tonnes of CO₂ emissions** annually and maintained a **54.9% renewable energy** share through solar and biogas utilisation. More than **600 students** and community members received hands-on training in waste management, sustainable agriculture, and bio-resource innovation, strengthening capacity for responsible consumption.

The University's **circular resource management model** spans organic, non-biodegradable, and biomedical waste streams. Biodegradable waste from hostels, canteens, farms, and gardens is repurposed through composting, vermicomposting, bio-enzyme production, and biogas generation. In 2024, **over 320 tons of food waste** were processed into nutrient-rich compost, **livestock feed, and Black Soldier Fly larvae** - creating a zero-landfill food system. Waste paper and cloth are upcycled into handmade stationery and craft products, while plastic waste is repurposed into **210,000 durable paver blocks**, reducing plastic pollution and supporting infrastructure development.

Centurion University has implemented a campus-wide waste tracking system to monitor waste generation and recycling. Color-coded bins are installed across the campus for effective segregation of biodegradable, non-biodegradable, and biomedical wastes. Waste data is regularly recorded and analysed to assess generation patterns throughout the year. This helps in ensuring efficient recycling and disposal practices.

The categories and amounts of waste produced from different sources across Centurion University campuses are summarised in the table below.

Table1: Annual Waste Generation Across Centurion University Campuses in 2024

Source/unit	Waste type	Quantity generated in (tons/year)		
		Biodegradable waste	Non-biodegradable waste	Biomedical waste
Academic Blocks	Paper waste, plastic waste, e-waste, glass waste	1.30	0.48	0.60
Hostels	Paper waste, plastic waste, Food waste	10.15	0.11	3.0
Canteen/ Food courts	Food Waste, Vegetable Waste, Plastic waste, Paper waste	310.00	0.50	NII

Cattle Shed	Cow dung	178.85	-	-
Garden and farms	Leaves, grass clippings, Garden cuttings	40.00	----	----
Offices/ Administrative blocks	Paper waste, plastic waste, e-waste.	0.70	0.10	----
Construction and Demolition Site	Construction and demolition waste	----	40.00	----
Wood Engineering production centre	Sawdust, wood chips, plywood waste,	6.20	0.01	----
Apparel unit	Cloth waste and wrappers	0.35	0.05	----
Total Waste Generated (591.74 tons/annum)		547.55	41.25	3.6

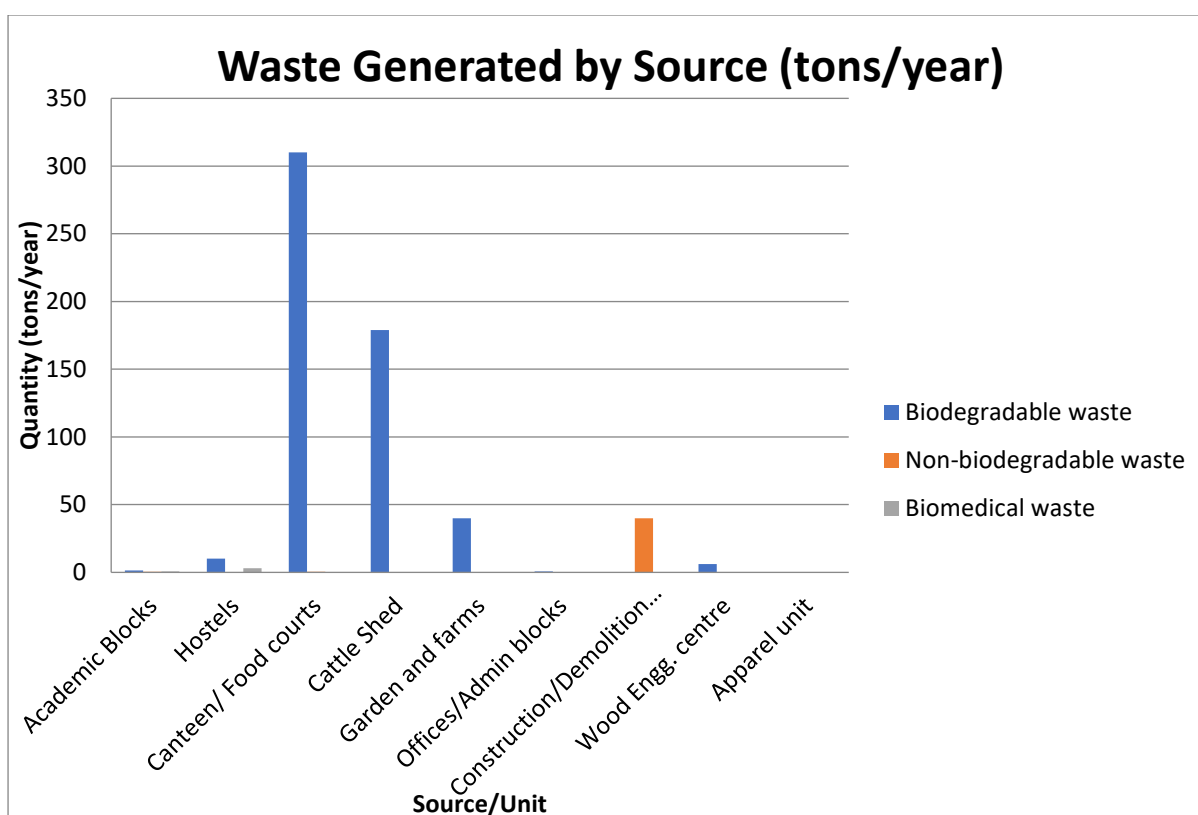


Fig. 1 Annual waste generation across Centurion University campuses in 2024

Disposal methods:

- All biodegradable wastes are recycled at Waste to Wealth facilities of Centurion University, Odisha.
- Plastic wastes generated inside the campus are recycled in Paver block unit established inside the lab and some are handed over to local Municipal.

- Glass and steel waste are systematically collected and transferred to the local municipal corporation for proper recycling and disposal.
- the liquid wastes are treated with 1% Sodium Hypochlorite Solutions before being drained into the sewage connection and the hazardous chemicals are kept separately in the laboratory away from the reach of students.
- Bio-medical wastes are segregated and handed over to Mediaid Marketing Services, Head Office at N-3/445, IRC village, Nayapalli, Bhubaneswar, Odisha. And also to Saniclean Private Limited, Bhubaneswar.
- Total C&D wastes are landfilled

Table-2: Wastes and their recycling/Disposal at Centurion University, Odisha in 2024

Types of waste	Waste Recycling/Disposal	Quantity recycled/ disposed (tons/ year)
Green Waste	Vermicompost	26.05
	Compost	12.30
	Biochar	1.10
	Bioenzymes	0.55
Cow dung	vermicompost	10.50
	Compost	150.10
	Biogas	18.25
Kitchen Waste	Compost	192.00
	Local piggery units	87.00
	As a feed for dairy and poultry	9.00
	Black Soldier Fly Larvae	32.00
Wastes from wood engineering	Compost	3.20
	Student domain project	0.50
	artistic wood product creations	0.20
	Biochar production	2.10
Paper and Cloth wastes	Handmade paper and products	1.85
Waste plastic	Paver block unit	0.90
Metallic Waste	Reused	0.10
Glass waste	Reused for artistic creation and land filling	0.20
Construction and Demolition Wastes	Land fill	40.00
Total Waste Recycled (tons/annum)		547.90

Table 3: Annual Yield of Products from Waste at Centurion University, Odisha in 2024

Products from waste	Yield (per year)
Vermicompost	21.93 tons (used as organic manure)
Biochar	0.80 tons
Bioenzymes	3.75 tons
Compost from cow dung and litter	115.20 tons (used as organic manure)
Biogas and biogas slurry	750 m ³ biogas (used as fuel for cooking) 7.30 tons Slurry (used as organic manure)
Compost from food waste	38.40 tons
Black Soldier Fly Larvae and frass (manure)	4.20 tons of larvae (used as protein-rich feed for fish, poultry, etc.) and 8.50 tons of frass (used as organic manure)
Paver block unit	210000 blocks (from plastic wastes, cement, aggregates and sand)
Handmade paper and products	1.40 tons of handmade paper



Fig. 2 Color-coded bins set up across the campus for the collection of biodegradable and non-biodegradable waste



Fig. 3 Color-coded bins for the collection of biomedical waste



Fig. 4 Collection and Measurement of green waste



Fig. 5 Collection and Measurement of cow dung from cattle shed





Fig. 6 Collection of food waste



Fig. 7 Measurement of food waste



Fig. 8 Collection of vegetable waste



Fig. 9 Measurement of vegetable waste



Fig. 10 Collection and measurement of wood waste



Fig. 11 Collection and measurement of Cloth waste



Fig. 12 Collection and measurement of plastic wastes





Fig.13 Collection of metallic waste



Fig.14 Collection of biodegradable and non-biodegradable wastes