



Centurion
UNIVERSITY
*Shaping Lives...
Empowering Communities...*

SDG 15 | Report on Life on Land

SDG 15

REPORT 2021



OUTLINE

I.	Targets	1
1.	Education to Support Land Ecosystems	
1.1.	Awareness Programs	2
1.2.	Good Food Policy	5
1.3.	Enhance Current Ecosystem Biodiversity	6
1.4.	Self-Sustaining Ecosystem Education Programmes	19
1.5.	Approach for Sustainable Management of Land	23
2.	Supporting Land Ecosystems through Action	
2.1.	University Initiatives Supporting Land Ecosystems	27
2.2.	Biodiversity Policy	29
2.3.	Efforts To Restore Local Biodiversity	31
2.4.	Community-based Land Ecosystem Maintenance	35
3.	Land-sensitive Waste Disposal	
3.1.	Courses and Initiatives to Maintain and Study Water Quality	41
3.2.	Policy on Recycling and Reduce Waste on Campus	43
3.3.	Hazardous Waste	44



I. Targets



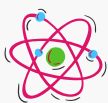
Protecting Biodiversity

Centurion University makes effort to conserve biodiversity. It has an in-situ Bees Butterfly and Cactus Garden facilitating biodiversity besides an apiary. The current production of honey is 24500 Kg/year and the University targets to increase the production to 31000 Kg/year by 2023.



End Deforestation and Restore Degraded Forests

Centurion University has converted pit created by illegal mining activity into ponds and uses it for Rain Water Harvesting. It has transformed one of such craters to a pond and targets to convert another by 2023.



Promote Access to Genetic Resources

Centurion University makes effort to use Genetic Engineering for speed breeding of plants. It has cultivated bananas and other speed breeding plants. The University targets to extend Genetic Engineering Services to outside client bases by 2023.



Community Awareness

Centurion University conducts awareness programs for the local community on sustainable usage of land. In the year 2020, it has conducted 7 awareness programs exclusively on persevering terrestrial ecosystems. The numbers increase to 12 in the year 2021 and the target for 2022 is set as 17.

II. The Context of Centurion University

Centurion University engages into sustainable practices for making life better on land and protecting all ecosystems for a sustainable future. The University has transformed a degraded landscape affected by illegal mining activities into a thriving campus with greenery in Bhubaneswar, India. It has also Bee Butterfly and Cactus Garden promoting bio and floral diversity. Another University`s campus in Paralekhmundi has conserved a total of three mountains and their ecosystem. All the lake ecosystems are conserved and are prevented from invasion of hyacinth. Water is conserved through Rain Water Harvesting and transforming unused areas as water reservoirs. The water reservoirs serve as an aquatic ecosystem where marine life thrives.

Overall, Centurion University strives to make “Life Better and Sustainable” both on land and water, aligning towards its commitment of Shaping Lives and Empowering Communities.



Jagannath Padhi
Director,
Centurion University



1. Education to Support Land Ecosystems

1.1. Awareness Programs

Utkal Krishi Mela

M.S. Swaminathan School of Agriculture, organized “Utkal Krishi Mela”. The theme for the mela was “Explored the Unexplored Affluent Agri Odisha”. The event was attended by farmers from various sectors including Fisheries and Agriculture, Entrepreneurs, Agro-based Company, students and faculties. After the inauguration program, there was a technical session where interaction between farmers and Subject Matter Specialist was held and they discussed about the scientific culture, solving of problems faced by the farmers etc. In the event, more than 2000 farmers have participated. The technical session was continued in day-2

The modern technologies viz. Drones in agriculture, AR, VR, Hydroponics, Hi-tech agriculture, Aquaponic, Recirculatory Aquaculture System etc. were demonstrated to the farmers and participants. Interaction of faculties and students with visitors in stalls about the technologies displayed in the form of models and posters. The stalls in the mela were set up by different Government and Private organisations including State Department of Agriculture, State Department of Horticulture, Private MNCs, Agri-implement companies, other Agricultural Universities, School of Fisheries, CUTM and Departments of Agriculture from M.S. Swaminathan School of Agriculture, CUTM etc. Pamphlets were distributed to the participants. The progressive farmers of Gajapati district were awarded during the event which was followed by cultural programme.



Soil Health Card service

Soil Health Card (SHC) Scheme is a scheme launched by the Government of India. Under the scheme, the government plans to issue soil cards to farmers which will carry crop-wise recommendations of nutrients and fertilizers required for the individual farms to help farmers to improve productivity through judicious use of inputs. All soil samples are to be tested in various soil testing labs across the country. Thereafter the experts will analyse the strength and weaknesses (micro-nutrients deficiency) of the soil and suggest measures to deal with it. The result and suggestion will be displayed in the cards.

Aligned with this scheme a collaborative approach has been taken with State Government and M. S. Swaminathan School of Agriculture started analyzing soil samples and issuing soil health card. A soil Health monitoring laboratory was set up in order to provide services for the SHC. Since the date of its inception a number of 200 Soil Health Card has been issued and work in progress with another 140 samples so far.



SOIL HEALTH MONITORING LABORATORY

GET TO KNOW ABOUT THE SOIL HEALTH OF YOUR FARM

SERVICES WE PROVIDE TO KNOW YOUR FARM SOIL HEALTH

Analyzing the presence of N, P, K in soil sample	Determining the percentage of Organic Carbon in soil sample	Testing pH and Electrical Conductivity of Soil
--	---	--

COST FOR TESTING SOIL SAMPLE- RS.500

SOIL HEALTH REPORT WILL BE GIVEN WITHIN 1 WEEK

CONTACT. NO-8144297933, 9390073799

Importance of soil health card:

- The scheme will monitor the soil of the farmers well and will give them a formatted report. So, they can decide well which crops they should cultivate and which ones they should skip.
- The soil card will give the farmers a proper idea of which nutrients their soil is lacking, which crops they should invest in, which fertilizers they need. So, ultimately, the crop yield will see a rise.



Details of soil health report:

PH: Soil pH is defined as the negative logarithm of the hydrogen ion concentration. The pH scale goes from 0 to 14 with pH 7 as the neutral point.


OC: Soil organic carbon is a measurable component of soil organic matter. Organic matter makes up just 2–10% of most soil's mass and has an important role in the physical, chemical and biological function of agricultural soils.

EC: Soil electrical conductivity (EC) is a measure of the amount of salts in soil (salinity of soil). It is an excellent indicator of nutrient availability and loss, soil texture, and available water capacity.

NPK: NPK stands for nitrogen, phosphorus and potassium. NPK involve nutrients available for plants from soil or in liquid nutrients.

Sample copy of Soil Health Card issued from Soil Health Monitoring Lab, MSSSOA, CUTM.



SOIL TEST REPORT			
 Soil Health Monitoring Lab, M.S. Swaminathan School of Agriculture Centurion University of Technology and Management Paralakhemundi, Gajapati, Odisha			
Farmer's Details			
Farmer's Name	Rajkant Gamage		
Sample No.	5		
Village Address	Tribh		
GP	Laxmipur		
SHS	Gayatri		
Date of Soil Test	22/06/2022		
SOIL TEST REPORT			
S. No.	Parameter	Value	
1	pH	7.3	
2	EC (dS/m)	0.197	
3	Organic carbon (%)	1.5	
4	N (kg/ha)	350	
5	P ₂ O ₅ (kg/ha)	32.41	
6	K ₂ O (kg/ha)	652	
Rating Chart for Soil Test Data			
Parameters	Acidic	Neutral	Alkali
pH	<6.5	6.5-7.5	>7.5
Parameters	Non-Saline	Slightly Saline	Saline
EC (dS/m)	0-2	2-4	4-8
Parameters	Low	Medium	High
Organic Carbon (%)	<0.4	0.4-0.75	>0.75
N (kg/ha)	<200	200-500	>500
P ₂ O ₅ (kg/ha)	<11	11-25	>25
K ₂ O (kg/ha)	<118	118-280	>280
 Signature & Stamp			
Contact Details: Mobile- 9164257833 Email- ssoa@cutm.ac.in			



1.2. Good Food Policy

This policy sets out our approach to supporting food systems that are environmentally, socially and economically sustainable. It contributes to a range of university commitments, which says the University will ensure that its actions and activities deliver positive change, our Climate Strategy, which describes how the University will respond to climate crisis, and our pledge to work with partners to advance the Sustainable Development Goals. Good Food is food and drink that is tasty, healthy, good for the environment and good for the people who make it. It is produced, purchased, transported, consumed and disposed of within food systems that are:

1. Environmentally sustainable by conserving or regenerating natural resources; avoiding pollution; mitigating emissions that cause climate change; protecting biodiversity; and upholding the highest standards of animal welfare.
2. Socially sustainable by fulfilling every person's right to adequate, healthy, safe, nutritious, good quality and appropriate food; providing people with opportunities to enjoy and learn about Good Food; and encouraging diverse food cultures.
3. Economically sustainable by delivering viable livelihoods for the people employed within food supply chains through living wages, workers' rights, fair trade and safe, decent working conditions; supporting thriving local economies; and ensuring Good Food is accessible and affordable for all.

[https://cutm.ac.in/download-pdf/?pname=/wp-content/uploads/About/rules-and-policies/good %20food&catID=144](https://cutm.ac.in/download-pdf/?pname=/wp-content/uploads/About/rules-and-policies/good%20food&catID=144)



1.3. Enhance Current Ecosystem Biodiversity

In the present study a preliminary survey was conducted at first in the entire campus to know the areas having different kinds of plantations. All the construction areas and entire farm land was visited visually for the documentation purpose. All the tree individuals having DBH ≥ 10 cm were taken for the study. As all the tree species were planted the identification was done mostly at the field. Complete enumeration was done for counting the individuals of all the species in the campus. For identification and counting of tree species, the study area was divided into different transects. All the data are expressed in the excel spread sheet and in that scientific name, common name, family, uses, IUCN status of collected tree species are mentioned. The occurrence and frequency of species were estimated. Based on the survey of the campus a total of 4195 no. of forest trees, along with plantation tree and horticultural species were recorded. From this survey, total 80 no. of species, 67 no. of genus ,30 families were recorded. Also recorded according the uses of trees i.e. fuel wood =348, timber =2232, fruit tree =1532, ornamental tree =787 and medicinal tree = 1954. Of all the families encountered the maximum number of trees found is teak tree (*Tectona grandis*) with a number of 1043 under the family Lamiaceae.

Table 1: List of Tree Species in campus

Sl. No.	Common Name	Scientific Name	IUCN Status	Family	Number Of Individuals
1	Fig	<i>Ficus carica</i>	Least Concerned	Moraceae	5
2	Royal Ponciana	<i>Delonix regia</i>	Least Concerned	Fabaceae	25
3	Devil tree	<i>Alstonia scholaris</i>	Least Concerned	Apocynaceae	242
4	Palash	<i>Butea monosperma</i>	Least Concerned	Fabaceae	6

Sl. No.	Common Name	Scientific Name	IUCN Status	Family	Number Of Individuals
5	Karanja tree	Millettia pinnata	Least Concerned	Fabaceae	77
6	Karaka tree	Canthium coromandelicum	Not Assessed	Corynocarpaceae	5
7	Neem tree	Azadirachta indica	Least Concerned	Meliaceae	71
8	Weeping fig	Ficus benamina	Least Concerned	Moraceae	274
9	Pride of India	Lagerstroemia speciosa	Not Assessed	Lythraceae	11
10	Kagzi lime	Citrus aurantifolia	Not Assessed	Rutaceae	37
11	Yellow Elder plant	Tecoma stans	Least Concerned	Bignoniaceae	8
12	Pine	Pinus spp. L.	Least Concerned	Pinaceae	2
13	Debdaru	Monoon longifolium	Not Assessed	Annonaceae	133
14	Royal palm	Dypsis lutescens	Near Threatened	Areaceae	48
15	Singapore graveyard flower	Plumeria obtuse	Least Concerned	Apocynaceae	49



Sl. No.	Common Name	Scientific Name	IUCN Status	Family	Number Of Individuals
16	Yellow flame tree / copper pod tree	Peltophorum pterocarpum	Not Assessed	Fabaceae	3
17	Cashew nut	Anacardium occidentale	Least Concerned	Anacardeaceae	43
18	Mango	Mangifera indica	Data Deficient	Anacardeaceae	861
19	Teak tree	Tectona grandis	Not Assessed	Lamiaceae	1043
20	Custard apple	Annona squamosa	Least Concerned	Annonaceae	13
21	Indian cherry	Frangula caroliniana	Least Concerned	Rhamnaceae	29
22	Coconut	Cocos nucifera	Not Assessed	Arecaceae	143

Sl. No.	Common Name	Scientific Name	IUCN Status	Family	Number Of Individuals
23	Guava	Psidium guajava	Least Concerned	Myrtaceae	104
24	Mangium	Acacia mangium	Not Assessed	Fabaceae	488
25	Cadamba	Neolamarckia cadamba	Not Assessed	Rubiaceae	25
26	Jack fruit	Artocarpus heterophyllus	Not Assessed	Moraceae	82
27	Tasmanian blue gum	Eucalyptus globulus	Least Concerned	Myrtaceae	19
28	Black tea tree	Melaleuca bracteata	Data Deficient	Myrtaceae	5
29	Thuja	Thuja occidentalis L.	Least Concerned	Cupressaceae	58

Sl. No.	Common Name	Scientific Name	IUCN Status	Family	Number Of Individuals
30	Oil nut	Calophyllum inophyllum	Least Concerned	Euphorbiaceae	31
31	Lemon	Citrus limon	Not Assessed	Rutaceae	16
32	Sapota	Manilkara zapota	Least Concerned	Sapotaceae	2
33	Sweet neem tree / curry leaf	Murraya koenigii	Least Concerned	Rutaceae	21
34	Gamhar	Gmelina arborea	Least Concerned	Lamiaceae	1
35	Kanchana	Bauhinia variegata	Least Concerned	Fabaceae	2
36	Sesendok	Endospermum diadenum	Least Concerned	Euphorbiaceae	1

Sl. No.	Common Name	Scientific Name	IUCN Status	Family	Number Of Individuals
37	Fiddle leaf plumeria	Plumeria pudica	Least Concerned	Apocynaceae	1
38	Jamun	Syzygium cumini	Least Concerned	Myrtaceae	2
39	China berry	Melia azedarach	Least Concerned	Meliaceae	1
40	Satin wood	Chloroxylon swietenia	Vulnerable	Rutaceae	1
41	Indian tulip tree	Thespesia populnea	Least Concerned	Malvaceae	2
42	Osier	Salix sp.	Least Concerned	Salicaceae	1
43	Weeping mulberry	Morus alba	Not Assessed	Moraceae	2

Sl. No.	Common Name	Scientific Name	IUCN Status	Family	Number Of Individuals
44	Khejri	Prosopis cineraria	Not Assessed	Fabaceae	1
45	Indian goose berry	Phyllanthus emblica	Least Concerned	Phyllanthaceae	4
46	Bael	Aegle marmelos	Near Threatened	Rutaceae	7
47	Big leaf mahogany	Swietenia macrophylla	Vulnerable	Meliaceae	1
48	Henna	Lawsonia inermis	Least Concerned	Lythraceae	2
49	English wal nut	Juglans regia	Least Concerned	Juglandaceae	1
50	Sandal wood	Santalum album	Vulnerable	Santalaceae	1



Sl. No.	Common Name	Scientific Name	IUCN Status	Family	Number Of Individuals
51	Scarlet bush	Hamelia patens	Least Concerned	Rubiaceae	3
52	Japanese wingnut	Pterocarya rhoifolia	Least Concerned	Fabaceae	1
53	Lipstick tree	Bixa Orellana	Least Concerned	Bixaceae	1
54	Chestnut leaved oak	Quercus castaneifolia	Near Threatened	Fagaceae	1
55	Sausage Tree	Kigelia Africana	Least Concerned	Bignoniaceae	1
56	Acacia	Acacia auriculiforms	Least Concerned	Fabaceae	72
57	orchid tree	Bauhinia purpurea	Least Concerned	Fabaceae	1



Sl. No.	Common Name	Scientific Name	IUCN Status	Family	Number Of Individuals
58	Peepal	Ficus religiosa	Not Assessed	Moraceae	4
59	Almond	Prunus dulcis	Not Assessed	Rosaceae	5
60	Banyan tree	Ficus benghalensis	Not Assessed	Moraceae	5
61	Palmyra palm/ Doub palm	Borassus flabellifer	Not Assessed	Areaceae	12
62	Shirisha	Albizia lebbeck	Least Concerned	Fabaceae	15
63	Rubber fig	Ficus elastica	Not Assessed	Moraceae	1
64	Red stem fig	Ficus variegata	Least Concerned	Moraceae	3



Sl. No.	Common Name	Scientific Name	IUCN Status	Family	Number Of Individuals
65	Red sandel wood	<i>Pterocarpus santalinus</i>	Endangered	Fabaceae	3
66	Indian plum/ber	<i>Ziziphus mauritiana</i>	Least Concerned	Rhamnaceae	4
67	Bread Fruit	<i>Artocarpus altilis</i>	Not Assessed	Moraceae	2
68	Pomelo	<i>Citrus maxima</i>	Least Concerned	Rutaceae	6
69	Spinous kino tree	<i>Bridelia retusa</i>	Least Concerned	Phyllanthaceae	5
70	Karra	<i>Cleistanthus collinus</i>	Vulnerable	Phyllanthaceae	3
71	Rain tree	<i>Samanea saman</i>	Least Concerned	Fabaceae	15



Sl. No.	Common Name	Scientific Name	IUCN Status	Family	Number Of Individuals
72	Shisham	Dalbergia sissoo	Least Concerned	Fabaceae	12
73	Long - leaved wattle	Acacia longifolia	Least Concerned	Fabaceae	1
74	Carambola	Averrhoa carambola	Not Assessed	Oxalidaceae	1
75	Indian trump tree	Oroxylum indicum	Not Assessed	Bignoniaceae	1
76	Date palm	Phoenix dactylifera	Least Concerned	Areaceae	3
77	Ritha	Sapindus mukorossi	Least Concerned	Sapindaceae	1
78	Chinese privet	Ligustrum sinense	Not Assessed	Oleaceae	1
79	Black cherry	Prunus serotina	Not Assessed	Rosaceae	1
80	Spanish cherry	Mimusops elengi	Least Concerned	Sapotaceae	1

TREE DIVERSITY OF CUTM(PKD CAMPUS)



Tectona grandis



Delonix regia



Alstonia scholaris



Ficus benjamina



Mangifera indica



Cocos nucifera

Figure 1. Common tree species of CUTM campus



(Fig 2, 3 and 4: B.Sc. students doing practical in Herbal Garden)



(Fig 5: Top view of Herbal Garden)





(Fig 6: Routine visit by in-charge and experts from the Dept. of Horticulture)



(Fig 7: Identification board installation)

1.4. Self-Sustaining Ecosystem Education Programmes

Centre for Smart Agriculture is a research center that offers awareness programs on various cultivation of plants species.

Web Link: <http://research.cutm.ac.in/courses/center-for-smart-agriculture/>

Apart from focusing on conventional agriculture, the Research Centre focusses on:

- Hydroponics cultivation of lettuce/spinach/coriander/ mint
- Mulching with different materials
- Different types of poly-tunnels and raising of seasonal vegetables
- Precision Nutrient Management in Rice/ Maize

Controlled use of water and fertilizers help reduce environmental pollution, soil degradation and water wastage.

Programs and Courses -Web Links:

School of Agriculture <https://cutm.ac.in/schools/ms-swaminathan-school-of-agriculture/>

School of Applied Sciences <https://cutm.ac.in/schools/school-of-applied-sciences/>

School of Agriculture and Bio-Engineering <https://cutm.ac.in/schools/school-of-agriculture-and-bio-engineering/>

CUTM offers graduate, post graduate and doctoral programs on ecosystems (looking at wild flora and fauna) for local or national communities. All the courses are approved by the Board of Studies (BOS) committee which includes external subject experts, industry personals and university academicians. The board goes through the agenda and approves the scheme and syllabus by some suggestions. The board authorizes the chairman of the committee to get necessary corrections according to the suggestions by the experts and finalizes the courses and syllabus. Centurion University of Technology and Management is committed to UN's Sustainable Development Goals and actively working on 12 of 17 SDG's. The Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability into the Curriculum Response.



Centurion University of Technology and Management efforts to sensitise students on socially relevant issues by integrating in the form of courses on Ethics, Human Rights, Gender Issues, Environmental Science and Disaster Management into the curriculum. Other than these prescribed courses, Safety & First Aid training and play on social values for students.



University creates awareness activities with the help of the different cells functioning in the University like Career Guidance Cell, Culture Sports and Recreation club, Anti-Ragging Cell, SC/ST and Minority Coaching Cell, NSS, NCC and Scout club. A few of the programmes are detailed below:



Climate change: The university conducts seminars which reflects on human rights, agriculture, global warming and ecological issues to sensitize the students and faculty members about climate change and generate ecological concern.

Environmental Issues: NSS and sports club focus on activities that deeply impress environmental consciousness among all. Movies and documentaries which generate love of nature are shown to the students. We have declared our campus plastic free, and foster a culture of love of nature. Students also conduct cleanness drive in nearby Railway station and city. Local plantation drives are conducted by students during monsoon season.



As part of BSc. Agriculture, B Tech Agri. Engineering, BSc. Fisheries Programs of Centurion University, various courses are offered where in the students learn about various ecosystems, different species of flora and fauna, their management, species conservation, sustainable use of various products derived from them. Some of the important courses are listed below:

Introduction to Forestry

Students learn their surrounding ecosystems, to identify the tree species and the uses of non-timber forest products (NTFP), biodiversity and threats to it, gaining knowledge about the choice of tree species for agro-forestry purpose. Also estimating the quantity of timber / firewood/NTFP (volume/weight) and other forest resources by using height and volume measuring equipment's and managing the forest nursery by applying nursery techniques.



Aquatic Ecology, Biodiversity and Disaster Management

Students learn function of various ecosystems, Importance and conservation of different ecological niches, Sea safety and health management of fisheries community, animal association and their environment and disaster management.



Agricultural Heritage

Agricultural Heritage is focused to promote student understanding, awareness about sustainable agriculture and to safeguard the social, cultural, economic and environmental goods and services these provide to family farmers, smallholders, indigenous peoples and local communities. Agricultural Heritage Systems learnings are from a Social-ecological Systems Perspective.

Organic Farming

The objective of this course is to impart traditional, innovative and scientific skills sustainably in organic farming and to demonstrate low-cost media preparation and impart eco-friendly inputs in Bio-fertilizer production.

Advances in Plant Ecology

As part of this course students can understand the concept of Ecology, describe bio geochemistry, energy flow, biodiversity and their response to climate change. They get to develop a broad range of knowledge about biological activity of toxic substance. Students will gain an overview of contemporary pollution issues and gain competency to understand the conservation biology.

Plant Ecology and Phytogeography

This course provides an understanding of the major factors influencing the geographic distribution of species. Students will be able to understand the ecological context in which a particular species may have evolved, or a specific ecological process takes place. This course serves as a lasting and practical basis for a career, for example, in research, industry or academia - as well as teaching, media, law, commerce, government or management.

Principles of Ecology

The course encourages the students to obtain knowledge about the Ecosystem and their functioning, so that they will be crusader of environmental sustainability, to convey the principles of ecology, to Provide examples from ecological studies, to illustrate the application of ecological principles to the management of ecosystems. Students acquire knowledge of intricate relationship of man and environment, the physical aspects of the environment to relationships between organisms and their environment and structure and function of ecosystems human influences on the global environment.



Climate Change, Sustainability and Organizations

The course helps to develop an understanding about climate change in general, responses and debates, to create awareness about the impact of climate change on organizations in performance, growth and sustainability, to facilitate in developing reference points to factor in aspects of climate change in organizational planning and development, to develop an understanding of sustainable development, SDGs and their relevance for sustainability of organizations, to comprehend the application of the Integrated Reporting Framework for Sustainability in business.



Introductory Agro-meteorology and climate change

The main objective of this course is to study about different climatic factors affecting crop growth and development, different weather aberrations, climate change, its cause and impacts. Students will be able to learn the impact of weather and climate on agricultural production system.

Waste Disposal and Pollution Abatement

This course helps to inculcate students the basic concepts of waste water discharge from milk reception dock, liquid milk processing section, butter, ghee, ice-cream, condensed milk, milk powder, cheese and paneer manufacturing, to acquaint students with the environmental issues by effluent discharges from dairy plant and to provide a brief idea on waste treatment process in dairy processing plant.

Renewable Energy Systems

To expose the students about energy demand and supply situation in India and to expose students about Renewable energy systems in use. This will enable them to understand the importance of renewable energy in a sustainable way. To have a knowledge of energy scene in India and to acquire the skill of analyzing and designing renewable energy systems.

Environmental Science

The main objective of this course is one must be environmentally educated to make our mother earth a better place to live, to understand the concept of multi-disciplinary nature of Environmental Science where different aspects are dealt with a holistic approach. The students will develop a sense of community responsibility by becoming aware of environmental issues in the larger social context.



1.5. Approach for Sustainable Management of Land

Agricultural Experiential Learning Programme (AELP) Projects

M. S. Swaminathan School of Agriculture, Centurion University of Technology and Management (CUTM) encourages hands on practices through AELP projects.

Some Web Links showing AELP projects:

<http://courseware.cutm.ac.in/courses/domain-genetic-engineering-and-genomics/>

<http://courseware.cutm.ac.in/courses/11961/>

<http://courseware.cutm.ac.in/courses/domain-nutraceuticals/>

Experiential Learning Programme

Experiential Learning (EL) helps the student to develop competence, capability, capacity building, acquiring skills, expertise and confidence to start their own enterprise and turn “Job Creators instead of Job Seekers”. This is a step towards “Earn while Learn” concept.

The M. S. Swaminathan School of Agriculture, CUTM, Paralakhemundi offered the B. Sc. (Hons) Agriculture, M. Sc. (Hons) Agriculture and B.Sc. (Hons) Aquaculture . Total number of students across all the programs are more than 1300.

READY program is designed for final year students which is divided into two semester and total credit hours are 0+20 for one semester.

1.Experiential Learning Programme (ELP) (0+20 credit hour)

A. Agro-Industrial Attachment

AIA/KUS/ICRISAT- Internship

Sl.No.	AIA/ Internship Industries	Students no.
1	BCT-KVK, Visakhapatnam, AP	14
2	Coromandel International Ltd. Visakhapatnam, AP.	1
3	Varanashi Organic Farms, DK, Karnataka	12
4	GTIDS (Gram Tarang Inclusive Development Services)	89
5	ICRISAT	25
	Grand Total	141

Out of 308 registered students 141 students are doing Internship and remaining 167 students are doing Agricultural Experience Learning Program.



A. Agro-Industrial Attachment (AIA/KUS/ICRISAT- Internship)



Fig. 1. Counting of plant stand in sorghum field.



Fig. 2. XRF send preparation (sorghum)



Fig. 3. Extraction of soil samples for boron analysis.



Fig. 4. Preparation of agarose gel for gel electrophoresis



Fig. 5. GTIDS students interaction with customer.



Fig. 6. GTIDS students sourced loan

M. S. Swaminathan School of Agriculture, Centurion University of Technology and Management- Rural Agricultural Works Experience (RAWE)

The students have conducted all RAWE related activities either in their own village or nearby village because of the COVID situation. All the activities thoroughly monitored by Guides and Supervisor through online and online platform called learning record was developed. All the presentation and evaluation conducted by online mode. This programme undertaken by the students during the VII semester for a total duration of 20 weeks with a weightage of 0+20 credit hours in two parts viz., RAWE and AIA. It consist of general orientation and on campus training by different faculties followed by village attachment/unit attachment in University/ College/ KVK or a Research station.

The students attached with the agro-industries to get an experience of the industrial environment and working. Weightage in terms of credit hours will be given depending upon the duration of stay of students in villages/agro-industries. At the end of RAWE/AIA, the students given one week time for project report preparation, presentation and evaluation. The students have recorded their observations in field and agro-industries on daily basis and prepared their project report based on these observations.

The students attached with the agro-industries to get an experience of the industrial environment and working. Weightage in terms of credit hours will be given depending upon the duration of stay of students in villages/agro-industries. At the end of RAWE/AIA, the students given one week time for project report preparation, presentation and evaluation. The students have recorded their observations in field and agro-industries on daily basis and prepared their project report based on these observations.

Sl.no.	Rural Awareness Works Experience	Total no
1	RAWE	272





2. Supporting Land Ecosystems through Action

2.1. University Initiatives Supporting Land Ecosystems

Centurion University has extensive and well planned campuses in Bhubaneswar, Parlakhemundi, Rayagada and Balangir, with 25% of the land area dedicated to green spaces. It has fostered renewable energy use and water conservation measures so as to reduce its carbon footprints. It has robust infrastructure in terms of quality and capacity to ensure that each student has access to the relevant facilities and a conducive environment for realizing the planned learning outcomes.

A number of initiatives has been taken for protection of environment such as tobacco and alcohol free campus, Plastic bag free campus, Conversion of biodegradable waste into biofertilizer, Plantation of trees, Regular cleanliness drive, Soil Conservation through plantation and contour development, Rain water harvesting, Energy Management practices, Regular awareness drive and competitions organized by Green Club, Erection of Grid interactive solar power plant, Waste water recycling through gardening, Annual census of floral and faunal resources, etc.

The first best practice outlined is Community Action Learning Program (CALP). The concept stems from a core belief and conviction that an institution is part of the larger community and everything the students learn should connect and contribute to a social impact.

Green Initiatives of the University in Agriculture

- Planting trees (in and around University campuses and also at local habitats) every year and protecting them till they are grown up.
- Managing pesticides in agriculture.
- Promoting urban agriculture and urban forestry at the community level, and terrace farming at the household level.
- Landscaping with trees and plants.
- Use of Biofertilizer and vermicompost.
- Precision Agriculture (<http://research.cutm.ac.in/courses/center-for-smart-agriculture/>).

Centurion University has extensive and well planned campuses in Bhubaneswar, Parlakhemundi, Rayagada and Balangir, with 25% of the land area dedicated to green spaces. It has fostered renewable energy use and water conservation measures so as to reduce its carbon footprints. It has robust infrastructure in terms of quality and capacity to ensure that each student has access to the relevant facilities and a conducive environment for realizing the planned learning outcomes.

A number of initiatives has been taken for protection of environment such as tobacco and alcohol free campus, Plastic bag free campus, Conversion of biodegradable waste into biofertilizer, Plantation of trees, Regular cleanliness drive, Soil Conservation through plantation and contour development, Rain water harvesting, Energy Management practices, Regular awareness drive and competitions organized by Green Club, Erection of Grid interactive solar power plant, Waste water recycling through gardening, Annual census of floral and faunal resources, etc.

The first best practice outlined is Community Action Learning Program (CALP). The concept stems from a core belief and conviction that an institution is part of the larger community and everything the students learn should connect and contribute to a social impact.

Evidence -2

Green Initiatives of the University in Waste Management

- Reusing solid waste in such a way that there is less burden on the government agencies to manage them.
- Protecting water bodies such as rivers, ponds, lakes and wetlands in the neighborhood.
- Ban on the use of Plastic.
- Waste to wealth (<http://research.cutm.ac.in/courses/center-for-waste-to-wealth-management/>).
- By using tankers instead of plastic barrels for transformer oil, CUTM is reducing waste generation.



2.2. Biodiversity Policy

- CUTM is committed to maintaining and wherever possible, enhancing, the quality of this environment, both for people who live and work in the University and for the wider community.
- CUTM's vision is to create the most stimulating, challenging and rewarding university experience in a world-class learning community by sharing its unique fusion of education, research and practice and inspiring our students and staff to enrich the world. The University recognizes that its operations have the potential to impact on biodiversity both directly and indirectly and that it has a responsibility to manage these impacts.

Identify and Monitor a species

1. Ensure ecological surveys.
 2. Actively seek opportunities to use the campuses as a Living Lab to link landscape management to education and research.
 3. Implement mechanisms for monitoring habitats and biodiversity on campus wherever possible.
 4. Actively encourage student and faculty-led monitoring projects at species level on campus.
 5. Review and update the Biodiversity actions with the Sustainability team at least once every year.
 6. Faculty members are encouraged to take classes in the gardens so that students and teachers can interact with the flora and fauna.
 7. Laboratory work for hands on training.
- CUTM is committed to maintaining and wherever possible, enhancing, the quality of this environment, both for people who live and work in the University and for the wider community.
 - CUTM's vision is to create the most stimulating, challenging and rewarding university experience in a world-class learning community by sharing its unique fusion of education, research and practice and inspiring our students and staff to enrich the world. The University recognizes that its operations have the potential to impact on biodiversity both directly and indirectly and that it has a responsibility to manage these impacts.

Conserve endangered species

- Seek to support projects and program that will conserve and, where possible, enhance habitats and biodiversity.
- Minimize the impact on habitats and biodiversity from grounds maintenance and landscaping work and prevent pollution by restricting the use of pesticides to a minimum.
- Seek to create, maintain and enhance habitats to encourage wildlife, where possible.
- Minimize the impact on biodiversity from development works and where possible seek a net increase in ecological value through project design and delivery.
- Ensure ecological surveys are completed prior to, and post completion of, building work and the results are documented.
- Work with stakeholders to improve habitat and biodiversity management practices.
- Provide training for staff to ensure contractors are able to meet the requirements of the Biodiversity and Sustainability Policies.
- Ensure all contractors are provided with a copy of the CUTM Design Standards which reference the Biodiversity Policy.
- Raise awareness of staff and students about biodiversity on campuses, as well as the importance of biodiversity in general.
- Encourage learning & teaching and research activities to contribute to the delivery of this policy, in particular promote grounds as an educational resource for student projects.
- Encourage and support CUTM participation and contribution (research, development, good practices, and policy/procedures) at relevant national and international forums.
- Work in partnership with environmental groups, local communities, and local authorities to share research and knowledge and improve biodiversity management practices.
- Collaboration with industry such as SunMoksha Power Pvt. Ltd. SunMoksha / Team.
- Focus on tissue culture and genetic engineering to preserve endangered species.



2.3. Efforts To Restore Local Biodiversity

Apiculture

This unit was established in 8th January 2019 for academic purpose with an aim to initiate AELP program on Apiculture to develop entrepreneurship among the students. Learning during working in the unit develops self-confidence for handling Bee-boxes and to generate income through producing honey and bee colonies. Visit to the apiary by the farmers will inspire and motivate the farmer to promote beekeeping in this South-Eastern district of Odisha. Such interested farmers can be educated by conducting Farmers training at University level by the Scientist and the AELP students.



Therefore, inside M.S. Swaminathan School of Agriculture, CUTM, Paralakhemundi campus apiculture unit has been established with 25 numbers of boxes (Indian honey bee, *Apis cerana indica*) of which 16 boxes have been installed in Coconut Orchard behind Dispensary, 7 boxes in Tribal village and 2 boxes are placed in the lawn of MDC, Guesthouse.

Each unit consisted of a wooden box containing colony of *Apis cerana indica* placed over a cemented stand. Subsequently boxes of each unit have been topped with a slanting wooden roofing top for protection and beautification.

University started production of honey in commercial level and selling under brand name JAGANATH Honey. Apart from honey university also started extraction of waxes and making their product like wax candle, scented candle. Following are some of glimpse of Honey production in CUTM.

Insect Diversity Study in and around the campus

Insect data was collected in and around Centurion University of Technology and Management, Paralakhemundi (Odisha: India), with a mercury vapour lamp and sweep net. Hence, no specific permissions were required for any of the collection localities/activities. Specimens were processed by a series of steps like sorting, cleaning, and mounting. Photographs were taken with a Leica DFC 425C digital camera on the Leica stereo zoom auto montage microscope and simple digital camera.

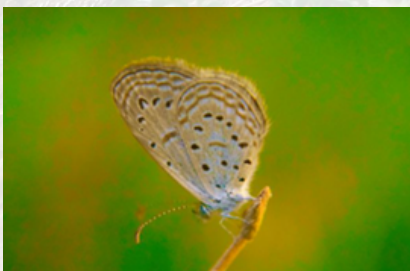
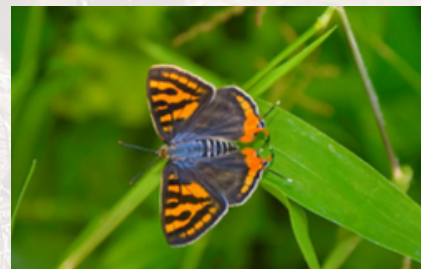
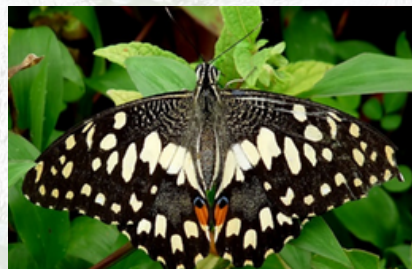
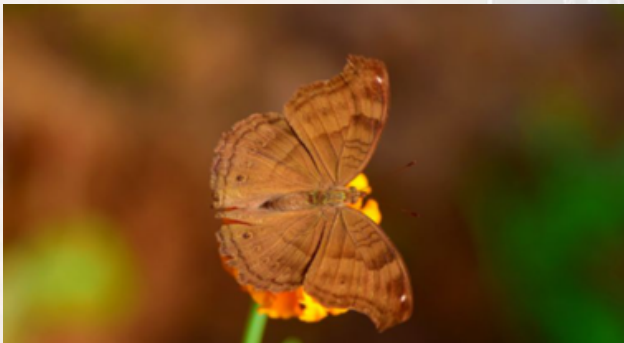
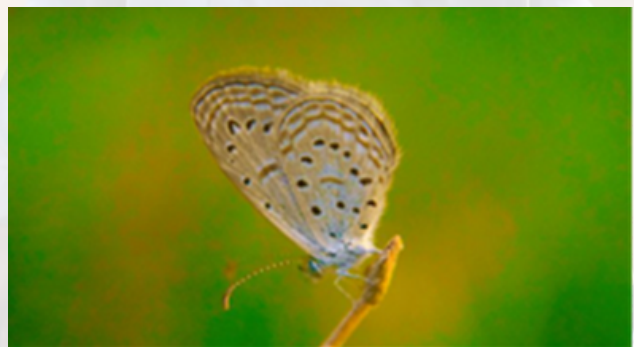
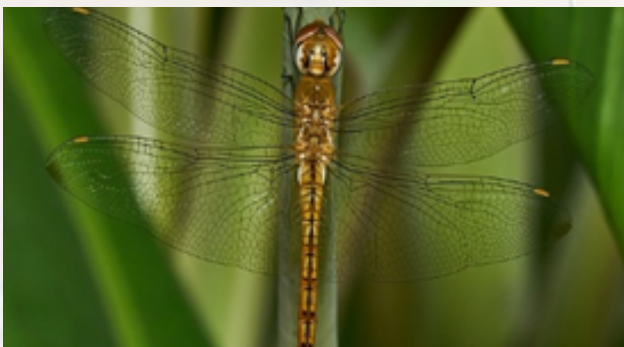
Sl.No.	Common name	Scientific name	Family	Order
1	Preying mantid	Mantis religiosa	Mantidae	Dictyoptera
2	Two-spotted assassin bug	Platymeris biguttatus	Reduviidae	Hemiptera
3	Scarlet skimmer	Crocothemis servilia	Libellulidae	Odonata
4	Globe skimmer	Pantala flavescens	Libellulidae	Odonata
5	Slender skimmer	Orthetrum sabina	Libellulidae	Odonata
6	Great spreadwing	Archilestes grandis	Lestidae	Odonata
7	Coconut rhinoceros beetle	Oryctes rhinoceros	Scarabidae	Coleoptera
8	Dung beetle	Dichotomius carolinus	Scarabidae	Coleoptera
9	Six-spot ground beetle	Anthia sexguttata	Carabiade	Coleoptera
10	Dark grass blue	Zizeeria knysna	Lycaenidae	Lepidoptera



Sl.No.	Common name	Scientific name	Family	Order
11	Tussock moth	Lymantria sp.	Lymantridae	Lepidoptera
12	Swallow tail butterfly	Papilio demoleus	Papilionidae	Lepidoptera
13	Rosy gypsy moth	Lymantria mathura	Lymantridae	Lepidoptera
14	Indian honey bee	Apis cerana indica	Apidae	Hymenoptera
15	Rock bee	Apis dorsata	Apidae	Hymenoptera
16	Beet webworm moth	Spoladea recurvalis	Crambidae	Lepidoptera
17	Quaker butterfly	Neopithecops zalmora	Lycaenidae	Lepidoptera
18	Chocolate pansy	Junonia iphita	Nymphalidae	Lepidoptera
19	The Tiny grass blue	Zizula hylax	Lycaenidae	Lepidoptera
20	Silverline	Cigaritis vulcanus	Lycaenidae	Lepidoptera
21	Cucumber moth	Diaphania indica	Crambidae	Lepidoptera



Sl.No.	Common name	Scientific name	Family	Order
22	Sugarcane looper	Mocis frugalis	Erebidae	Lepidoptera
23	The common evening brown	Melanitis leda	Nymphalidae	Lepidoptera
24	Greensilk moth	Trilocho varians	Bombycidae	Lepidoptera
25	Peacock pansy	Junonia almosa	Nymphalidae	Lepidoptera
26	Common Pierrot	Castaleus rosimon	Lycaenidae	Lepidoptera
27	Common Branded Redeye	Matapa aria	Hesperiidae	Lepidoptera



2.4. Community-based Land Ecosystem Maintenance

Seed production in Paddy, Maize and Okra

Hybrid crop production is the best strategy for increasing crop yields. Hybrids perform better than varieties because of heterosis and hybrid vigour. Multilocation trials were being conducted in and around three separate farms, namely Ganadahati, Ranadevi, and R. Sitapur, to show the effectiveness of hybrid types in the paddy, maize, and okra crops as well as their adaptability to our agroclimatic zone. In the aforementioned fields, one hybrid of paddy (Marvel 1011), two hybrids of maize (Saghan and Don) and one hybrid of okra (Kashi Shrishti) were grown on respective plots of 49 acres, 30 acres, and 1 acre. Faculty from the Centurion University's Genetics and Plant Breeding, Agronomy, and Horticulture (Vegetable Science) departments were actively involved in the production of commercial hybrid seeds. Students in the AELP Seed Production domain enthusiastically participated in the production of paddy, maize, and okra seeds.

Seed production in paddy

The medium-tall, semi-compact Marvel 1011 hybrid has a crop maturation period of 120–125 days and is resistant to BPH, BLB, and blast tolerance. In CUTM farms, the crop was planted in 2meter-long strips in June, leaving 30 cm-wide alleyways. In this area, there was aggressive tillering and robust crop establishment. The right intercultural operations kept the fields free of weeds. In all three farms, the team measured the panicle length (32–35 cm on average), number of tillers per hill (10–14 on average), plant height (95–110 cm on average), and quantity of grains per panicle (200–300 in number). This hybrid shows no signs of pests or diseases. In all three farms, the anticipated yield may increase to 25 to 30 quintals per acre.

Seed production in maize

Saaghan and DON, two hybrids that were chosen for commercial seed production at the CUTM farm in R. Sitapur. Both hybrids mature in 110–115 days during the Kharif season, produce one ear per plant, and are resistant to most major diseases and pest attacks. The crop was sown in this area in July, and good germination was seen. To increase the crop canopy and for improved crop growth, proper intercultural operations such as fertilizer application, weeding, and earthing up were carried out. The team measured the plant height (average: 160 cm), number of cobs per plant (one), the average length of a cob (20 cm), average number of rows of kernels on a cob (14–16 on average), and average number of kernels per row (24–28 on an average). The predicted production per acre could increase to 10–15 quintal per acre.



Seed production in okra

For the first time, CUTM has begun producing hybrid okra seeds on an one acre of land in R. Sitapur. Male and female parental line of Kashi Shrishti (VROH-12) were bought from IIVR in Varanasi, UP. Additionally, CUTM and this organization have a Memorandum of Understanding in place, and CUTM also holds a license for commercial seed production and distribution. Okra parental lines were sowed in a 4:1 ratio (female: male). To keep the crop stand, proper intercultural operations were carried out. In order to create hybrid seeds in okra, timely and frequent pollination and emasculation were performed. The anticipated yield could increase to 4 kg per acre.

Field photographs of cultural operations in seed production farms



Faculty members and AELP students involved in seed production



Paddy packet 3 Kg



Nursery preparation in Paddy



Seed treatment of paddy



Paddy field



Visit by DoA Scientist from KVK and MSSSoA in paddy field



Monitoring for crop establishment in maize



Tassel initiation stage in maize



Maturity stage in maize



Cob with intact husk in maize



Pre-emergence herbicide spraying in okra



Emasculation in okra



Pollination in okra



Fungicide spraying in okra

Students research trial at CUTM farm at Bagusala

The CUTM research farm in Bagusala is located near Parlakhemundi's seventh mile in the Gajapati district of Odisha. The distance from it to the Centurion campus is 10 kilometres. Here, master's students studying agronomy and crop production may conduct their research trials. Students are given a certain amount of land and access to all agricultural facilities in this location to conduct their research trials. On the allocated land, the students produce crops related to the many agronomic topics listed below.

- To monitor crop growth and productivity by using various fertilizer doses
- To research cutting-edge cropping techniques
- To evaluate the effectiveness of water consumption and crucial irrigation stages for different crops
- To assess the impact of weed control on various crops and to examine the impact of applying herbicides at varying concentration
- To study whether mulching or other forms of protected cultivation affect crop development and yield
- Assessment of nutrient management for better nitrogen, phosphorous, and potassium usage as well as agronomic effectiveness in different crops



Students research trial at CUTM farm at Ranadevi

CUTM farm at Ranadevi is a remote village in Parlakhemundi in the Gajapati district of Odisha. It is 2.8 kilometers away from the Parlakhemundi campus of CUTM. Students pursuing their master's degrees in Horticulture as well as Genetics and Plant Breeding in Ranadevi conduct research on a variety of current issues aimed at enhancing agricultural growth. The research activities are primarily focused on solving the current agricultural issues in this area, and the research programme is established by faculty members and carried out by M.Sc. students using anticipatory approaches.

- The department of Genetics and Plant Breeding's primary research topics are listed below, which involve modifying plant species to produce desired genotypes and phenotypes for particular uses. Controlled pollination, genetic engineering, or combinations of the two are methods of manipulation that are followed by the artificial selection of offspring.
- Collection, evaluation and screening of various crop genotypes against biotic and abiotic factors
- To study the genetic variation present in the set of germplasm lines
- To study genetic diversity for the selection of genetically divergent parents using morphological and molecular markers
- To study combining ability and heterosis in various crops
- Stability study for yield and yield components in different crops
- Quality seed production in different crops
- Construction of genetic linkage map of crops using DNA markers
- Morphological and genetic characterization of crop landraces

The major areas of research are enumerated for Horticulture department are mentioned below which covers a broad range of plant types, including fruits and vegetables, landscape plants, woody plants and more.

- Effect of planting date and variety of different horticulture crop
- Morphological characterization and yield of horticulture crops
- Effect of some fertilizer types on growth, yield and quality of vegetable crops under protected condition
- Effects of nitrogen, phosphorus and watering regimes on growth of horticultural crops
- Genotype × Environment interaction studies on the performance, adaptability and stability of various horticulture crops.





3. Land-sensitive Waste Disposal

3.1. Courses and Initiatives to Maintain and Study Water Quality

Some of the important courses taught at Centurion University of Technology and Management related to the above-mentioned areas are:

1. Water and soil quality management in aquaculture

Web Link: <http://courseware.cutm.ac.in/courses/water-and-soil-quality-management-in-aquaculture/>

2. Monitoring of water quality

Web Link: <http://courseware.cutm.ac.in/wp-content/uploads/2020/05/water-quality.pdf>

3. Soil and Water chemistry

Web Link: <http://courseware.cutm.ac.in/courses/soil-and-water-chemistry/>

4. Soil and Water Conservation through Watershed

Web Link: <http://courseware.cutm.ac.in/courses/soil-and-water-conservation-through-watershed/>

5. Aquatic Pollution

Web Link: <http://courseware.cutm.ac.in/courses/aquatic-pollution/>

The Campus and water

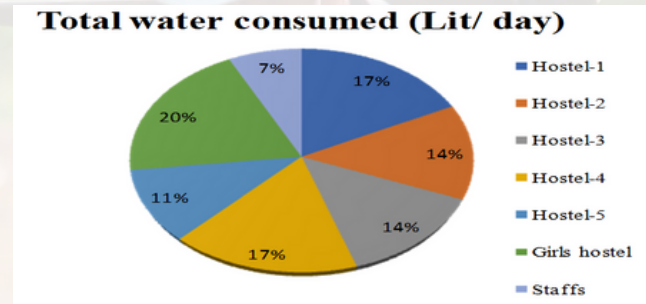
The university campus has massive use of water at different hostels, staff quarters and office. The campus is using a total of 279000 lit/day, which is a big amount cannot be ignored. Hence water treatment is matter of concern. Looking towards requirement of water for human, animal and agriculture use, the university has set its own Sewage Treatment Tank (STP) inside the campus. Looking towards the massive use of water, water treatment plant is required in the campus. In case of water crisis the treatment water can be used for gardening farming purposes. Centurion campus has a very big garden of about 5 acres which needs lot of water and the water from the treatment plant can be used for gardening. Our campus borrows water from a very far place which is highly expensive. During rainy season a large amount of water wasted by flowing through drainage which can be used by the campus through treatment process. Since there is B.Sc. Agriculture in the college the treatment water can be used by the students for plantation. Many new buildings are being constructed inside the campus which needs a large amount of water for curing the bricks and watering the foundation, wall and slab. To certain extent the treated water can meet the demand of construction works.



During summer the water supply to the hostel is just time to time and not regular so treatment plant is highly essential to this site. Thousands of gallons of water is used by the students, staff and mess members lot of water is wasted through drains so, constructing a treatment is very important. The drain water is deposited in the tank but of no use after the tank is filled the water is removed and wasted. Since there is a hill nearby our site there comes a large amount of surface runoff water which can be treated for our domestic use.

To avoid further future a problem regarding water a waste water treatment plant is definitely required.

It is essential to access the quality of the waste water coming from the university campus.



The following are the conventional test to be carried out in establishing the water quality. The recorded data of different tests of waste water are described in the figures 1, 2 & 3 below:

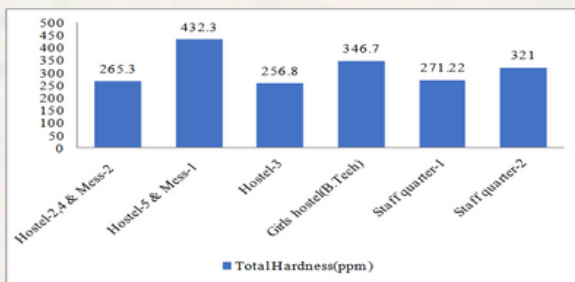


Fig 1: Hardness of water

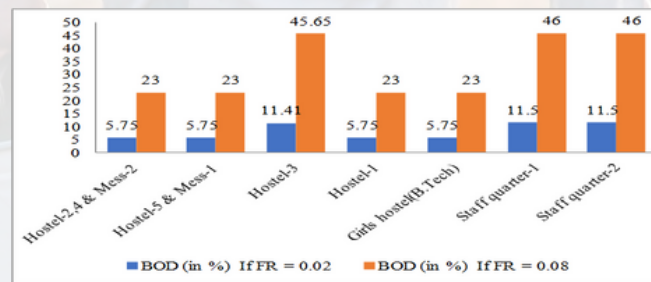


Fig 2: Biological Oxygen Demand

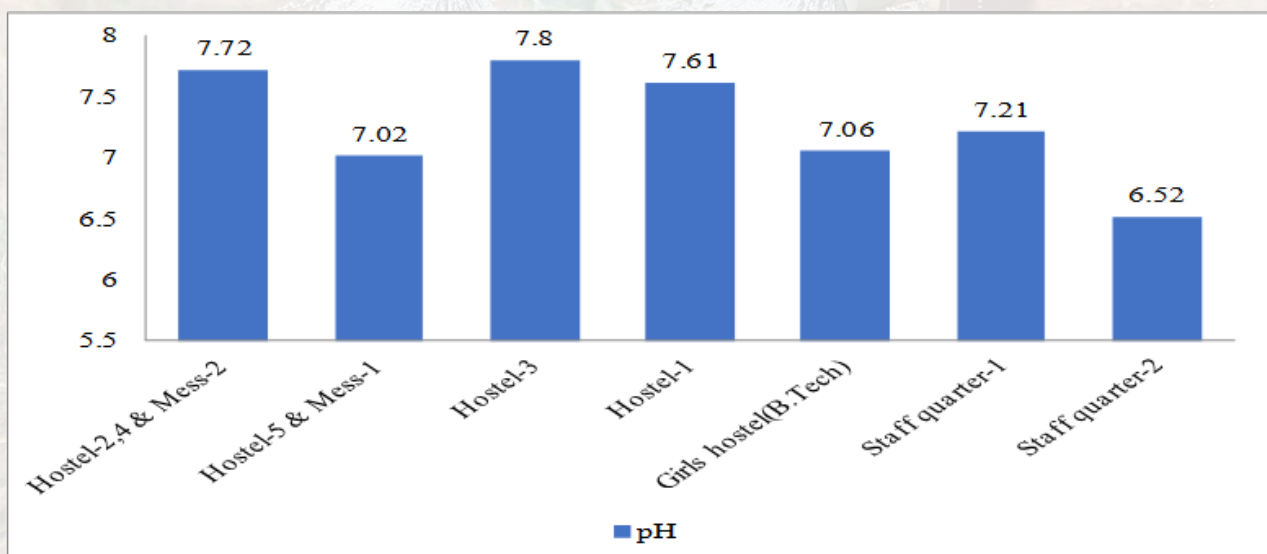


Fig 3: pH Process of waste water treatment

3.2. Policy on Recycling and Reduce Waste on Campus

Centurion University is committed to reducing its environmental impacts through effective waste management and aims to divert at least 90% of waste from landfill. The purpose of this policy is to enable the university to honour its commitment to manage waste responsibly.

Definitions:

Waste: Waste includes any substance or object which the holder discards or intends or is required to discard and any substance which constitutes a scrap material, an effluent or other unwanted surplus arising from the application of any process or any substance or article which requires to be disposed of which has been broken, worn out, contaminated or otherwise spoiled as per the Environmental Protection Act 1990 and amendments.

General waste: A form of controlled waste, comprising of all waste from the university the exception of fibre, co-mingled recyclables, food waste and hazardous waste.

Fibre waste: Card and paper

Co-mingled waste: Cans, Glass and Plastic. Note the absence of food as this will contaminate recyclables

Hazardous Waste: It includes waste that could, in certain circumstances, be harmful to human health or the environment in the short or long term due to its physical, chemical or biological properties. Batteries, fluorescent tubes, photographic chemicals, paint, waste oils, solvents, acids, alkaline solutions, pesticides and electrical equipment are all hazardous wastes.

Plan for Effective Management of waste

To manage waste responsibly, the university does:

- Remain compliant with all relevant waste legislation;
- Aim to reduce the amount of waste generated and the associated environmental impacts by applying the principles of the waste management hierarchy;
- Provide facilities to ensure the safe handling, effective segregation and secure storage of waste on all campuses, with these aimed at maximising reuse and recycling opportunities;
- Set specific objectives and targets in relation to minimizing waste, improving recycling rates and reducing disposal to landfill;
- Complete regular waste audits in order to drive continual improvement;
- Provide appropriate training and induction for staff, students and visitors around waste practices and site specific requirements



Steps for effective waste management across the university

All staff, students, contractors and visitors have a personal responsibility to ensure the waste they create is dealt with in accordance with this policy. Chief consideration must be given to applying the waste management hierarchy to all activities across the university.

- Reduce: Only order/purchase/use the amount of materials required
- Reuse: Retain materials which can be reused onsite or by others
- Recycle: Segregate to maximise value of material for recycling
- Recover: Energy from waste will be recovered where facilities allow
- Dispose: Last resort
- Research: Centre for Waste to Wealth is dedicated to developing strategies to use waste and convert it to useful product. <http://research.cutm.ac.in/courses/center-for-waste-to-wealth-management/>



3.3. Hazardous Waste

The Biomedical Waste Bins are colour coded for managing the segregation of different Biomedical wastes into separate bins. CUTM collaborates with external organizations which are expert in handling hazardous waste. Non-Government Organization "Sani Clean Private Limited" through an MoU for disposal of the wastes on a daily basis. The vendor from the company picks up the wastes from the colour coded bins and disposes it by duly adhering to the government regulations and guidelines applicable for Biomedical Waste Management Policy.

