Centurion University

Shaping Lives...
Empowering Communities...

Times Higher Education
Sustainability
Impact Network

SUSTAINABLE DEVELOPMENT GOAL 9

INDUSTRY, INNOVATION & INFRASTRUCTURE

SUSTAINABLE DEVELOPMENT GOALS

1 NO POVERTY | 2 ZERO HUNGER | 3 GOOD HEALTH AND WELL-BEING | 4 QUALITY EDUCATION | 5 GENDER EQUALITY | 6 CLEAN WATER AND SANITATION | 7 AFFORDABLE AND CLEAN ENERGY | 8 DECENT WORK AND ECONOMIC GROWTH | 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE | 10 REDUCED INEQUALITIES | 11 SUSTAINABLE CITIES AND COMMUNITIES | 12 RESPONSIBLE CONSUMPTION AND PRODUCTION | 13 CLIMATE ACTION | 14 LIFE BELOW WATER | 15 LIFE ON LAND | 16 PEACE, JUSTICE AND STRONG INSTITUTIONS | 17 PARTNERSHIPS FOR THE GOALS

1. Executive Summary

Centurion University continues to pioneer India's vision for **SDG 9: Industry, Innovation, and Infrastructure**, transforming education into enterprise and innovation into tangible, sustainable and scalable impact. Through its **6 campuses**, **40 rural outreach centres**, **15,000 students**, and **1,800 faculty and staff**, Centurion University has built a unique **"education-to-enterprise" ecosystem** that integrates learning, research, production, and entrepreneurship into one seamless model of inclusive, sustainable industrialisation.

Recognised by the Ministry of Skill Development and Entrepreneurship, Government of India as a Centre of Excellence, Centurion University is redefining the future of skill-integrated higher education. Its 52+ industry-sponsored labs, 30+ production units, and 138+ partnerships with leading organizations - including Schneider Electric, Dassault Systems, Ashok Leyland, and Yamaha - serve as live laboratories for students, enabling them to co-create innovative, market-ready solutions that contribute directly to India's industrial and technological advancement.

Between **2021 and 2024**, the University's innovation output has grown exponentially:

- **74 active start-ups (up from 51 in 2021)** through the **Centre for Innovators, Entrepreneurs and Commercialization (CIEC)**.
- **Industry research income** grew from **₹35 crore in 2021–22** to **₹73 crore in 2023-24**, reflecting a **108% increase** in industry trust and collaboration.
- Over **100+ patents filed**, and **2,155 SDG-linked publications** earning **15,075 citations**, reinforcing Centurion University's position as a national research leader.
- A growing academic community, with **605 faculty in 2024**, driving innovation across STEM, healthcare, and humanities.

Centurion University's innovation ecosystem extends far beyond campus boundaries. Through its **Gram Tarang Group of Enterprises**, it transforms knowledge into livelihood and inclusion:

- **GTET** has trained **300,000 youth** across 32 locations, achieving **80% placement** across 200 companies.
- **GTIDS** operates across **14 states**, deploying **8,500 financial inclusion agents** and disbursing **₹400 crore** in microfinance loans to rural women and entrepreneurs.

- **GT Tech** pioneers **AR, VR, AI, and robotics applications** across agriculture, mining, and design - empowering **10,000 farmers** with digital tools.
- **Gram Tarang Foods** and **Vocational Education & Training Units** create green jobs through local production, bio-based industries, and export-ready value chains.
- Innovation-driven enterprises such as SUPERBEE Aeronautics (drones), Skyy Rider EVs, and GT Transformers embody the University's commitment to "Make in India" and "Skill India", while student-led initiatives turn ideas into scalable, sustainable ventures.

Through **Centurion's Research Centres** - spanning smart infrastructure, data science, agri-tech, biotechnology, renewable energy, and advanced manufacturing - the University has created a robust applied research network. State-of-the-art facilities such as the **AR/VR Lab, 3D Printing Lab, Smart Agriculture Centre, Biochar and Bioenzyme Units, and Speed Breeding Chambers** foster next-generation innovation aligned with the **Fourth Industrial Revolution (Industry 4.0)**.

The University's **Waste-to-Wealth** and **Biochar programs** demonstrate how sustainability and innovation intersect, converting waste into renewable products while reducing environmental impact. Similarly, the **Applied Entrepreneurship and Learning Program (AELP)** embeds enterprise-led learning within curricula, allowing students to operate real production units that link academic credit to economic output. Centurion University's infrastructure is equally forward-looking - smart, green, and inclusive. Each campus integrates renewable energy, sustainable waste management, water harvesting, and zero-pollution principles, ensuring that growth remains climate-resilient. Through these multidimensional efforts, **Centurion University is not just aligning with SDG 9v- it is embodying it**. By **bridging academics, industry, and community**, Centurion University demonstrates how innovation, when driven by purpose, can build **resilient infrastructure, inclusive growth, and sustainable futures**.

Summary - Our Impact on SDG 9 - Industry, Innovation and Infrastructure						
Dimension	**Impact Area/Indicator**	**Initiatives**	**2024 Data**	**Output**	**Impact**	**2030 Target**
Innovation Access & Engagement	Enhance scientific research and increase the number of R&D workers.- SDG 9.5	Accessible Innovation Ecosystem	Inclusive access for 12,000+ students and 400+ faculty innovators	Innovation hubs, TBI (Technology Business Incubators), and open innovation challenges	Expanded participation in innovation and entrepreneurship; empowered students and faculty to develop practical solutions and prototypes.	
	Support domestic technology development, research, and innovation.- SDG 9.b	Women and Tribal Entrepreneurs Supported	58% of start-ups women-led; 12% tribal-founded	Equitable incubation, funding and mentorship access	Strengthened gender and social equity in entrepreneurship; fostered diverse, inclusive start-up ecosystem.	
	Upgrade infrastructure and retrofit industries to make them sustainable.- SDG 9.4	Industry-Partnered Labs and Centers	50+ industry-partnered labs operational	Joint R&D, prototyping, and skill-oriented lab engagement	Enhanced hands-on learning, industry-relevant R&D, and collaborative innovation opportunities.	
Market and Mentorship Support	Promote inclusive and sustainable industrialization . - SDG 9.2	Start-ups and Social Enterprises Supported	74 active ventures (₹18 Cr cumulative valuation)	Support in prototyping, market access, and technology transfer	Accelerated growth and market readiness of start-ups; promoted social enterprise solutions.	
Patents and Publications	Encourage innovation and R&D investment.- SDG 9.5	Patents Filed and Granted	82 filed, 15 granted (2024)	Innovations in agri-tech, biotech, and renewable systems	Advanced technology development and knowledge protection; strengthened IP creation in agri-tech, biotech, and renewable systems.	200+ patents filed and 50+ granted by 2030

	Enhance scientific research and support tech innovation- SDG 9.5	Research Projects and Publications	150+ funded projects; 500+ indexed papers (Scopus/WoS)	Interdisciplinary research in AI, sustainable materials, and green energy	Increased research output, interdisciplinary knowledge generation, and global academic visibility.	
Advanced Labs and Infrastructure	Sustainable and resilient infrastructure- SDG 9.4	Sustainable Infrastructure Development Policy	Implemented Green Campus & Resilient Infrastructure guidelines (2024)	Policy ensures eco-design, energy efficiency and climate resilience in construction	Promoted eco-friendly, energy-efficient, and climate-resilient campus infrastructure; reduced environmental footprint.	
	Support domestic R&D and infrastructure for innovation- SDG 9.b	Innovation Labs & Centres of Excellence	20 Centres of Excellence; 15 Innovation Labs functional	Specialized R&D facilities in smart manufacturing, bioengineering, robotics, and materials science	Facilitated advanced R&D, prototyping, and specialized skill development in high-tech domains.	
Community Impact	Increase access of small-scale industries to financial services and integration into value chains. - SDG 9.3	Rural Innovation Outreach	30+ community-driven innovation pilots	Frugal innovation for livelihood, water management, biochar, and farm mechanization	Delivered practical, frugal solutions for rural challenges; improved livelihoods, water management, and agricultural productivity.	
	Promote SME development and entrepreneurship- SDG 9.3	Infrastructure for Micro-Enterprises	Support extended to 500+ local micro-enterprises	Rural infrastructure, processing units, and entrepreneurial mentoring	Strengthened rural entrepreneurship, local economic development, and micro-enterprise sustainability.	
Technology and Transformation	Upgrade infrastructure for sustainability and access to ICT.- SDG 9.4	Digital Manufacturing and Industry 4.0 Skills	2,000+ students trained in CNC, IoT, robotics, and 3D printing	Technology-integrated skill labs and simulation platforms	Built Industry 4.0-ready workforce; enhanced digital manufacturing and	

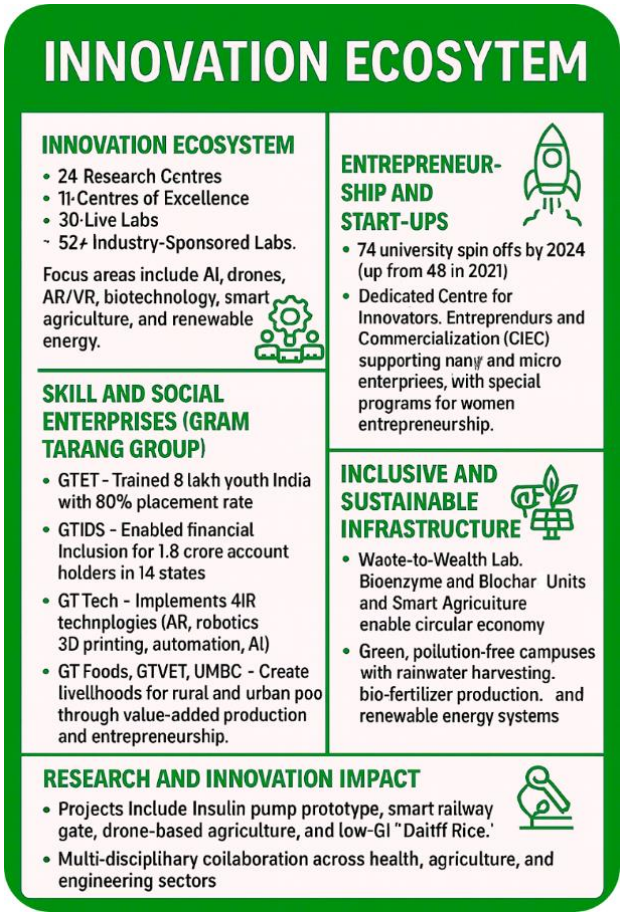
					technology skills.	
	Significantly increase access to ICT and universal internet access - SDG 9.c	Smart Campus and Digital Infrastructure	100% smart classrooms; 95% network uptime across campuses	IoT-enabled operations, virtual learning environment, and digital management tools	Enabled seamless digital learning and operations; improved campus efficiency through IoT and virtual management tools.	

Category	Metric	Achievement
Campuses & Centres	Total campuses	6
Rural outreach centres	Rural outreach	40
Industry-sponsored labs	Industry-sponsored labs	52+
Research centres	Patents filed	**100+**
Innovation & Research	University start-ups (2024)	74
Entrepreneurship	Industry income (2023–24)	₹73 crore
Employment & Skill Development	Youth trained by GTET	8 lakh
Technology & Production	Placement rate	80%
Agriculture drones deployed	Agriculture drones deployed	168
EVs produced (Skyy Rider)	EVs produced (Skyy Rider)	Growing year-on-year
Infrastructure & Innovation Units	Industry units generating revenue	₹ 150 crore

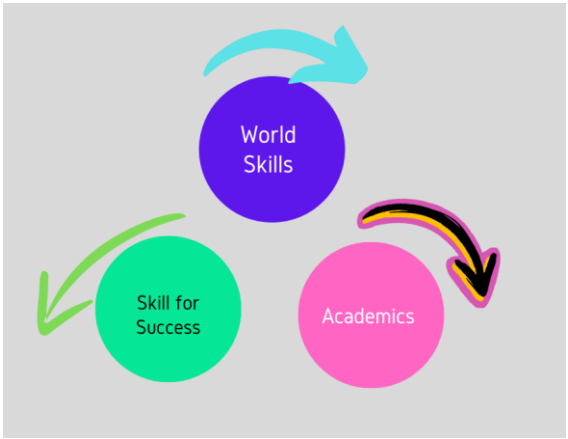
1. Centurion University at Glance

Centurion University is one of the leading skill universities in India. Its unique model lays specific emphasis on creating sustainable livelihoods in challenging geographical and rural demographics through education that results in employability and kindles entrepreneurship. This model has been applauded by the Government of Odisha, Government of India policy think tanks such as the NITI Aayog, and many leading international organizations such as the United Nations, UNESCO, World Bank, and British Council. Centurion University incubated 34 startups in 2020 & 52 startups in 2022, which increased to 72 and 74 startups in 2023 and 2024 respectively.

- **Commitment to SDG-9**: Centurion University actively promotes Sustainable Development Goal 9 by focusing on building resilient infrastructure, sustainable industrialization, and fostering innovation through various initiatives and partnerships.
- **Recognition as a Centre of Excellence**: The Ministry of Skill Development and Entrepreneurship, Government of India, recognized Centurion University as a Centre of Excellence for its industry-linked education model, emphasizing practical, real-time exposure.
- **Skills for Success Program**: The University's flexible curriculum allows students to pursue skill courses outside their specialization, fostering innovation, scientific temper, and entrepreneurial spirit among students.
- **Student-led Startups**: Centurion University has nurtured several student-led startups, including a proposed health and social care startup led by a female student who won a Gold medal in the National Skill Competition.



"Centurion University: Bridging Academics, Skills, and Success for Global Impact."



1.1 “Nurturing Ideas into Enterprises: Yearly Growth of University Spin-offs.”

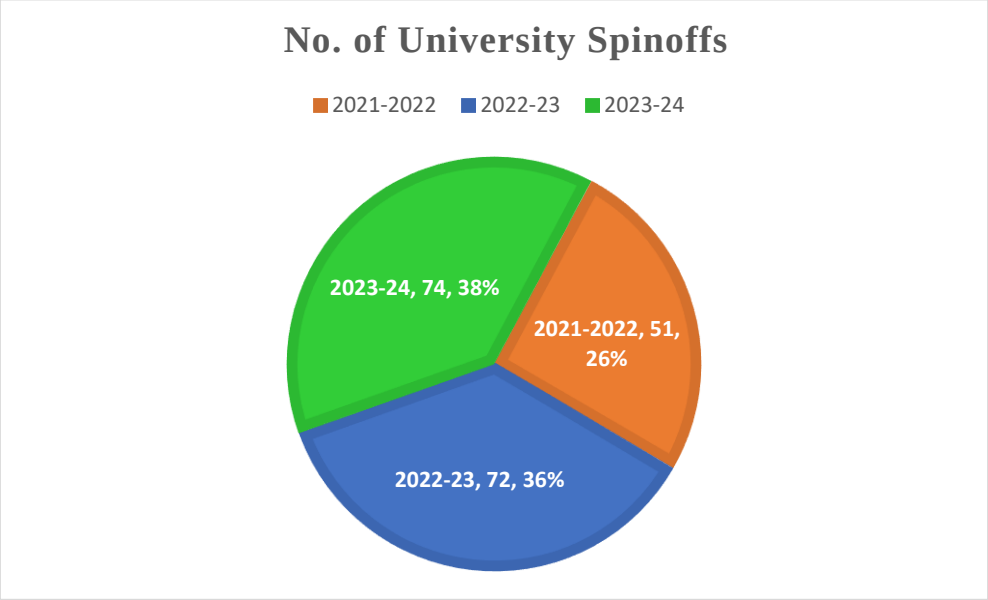


Fig.1 Pie chart showing No.of University Spin offs

The number of university spinoffs increased consistently from 51 in 2021–2022 (26%) to 72 in 2022–2023 (36%), and further to 74 in 2023–2024 (38%), highlighting the University’s expanding innovation ecosystem. This growth demonstrates Centurion University’s commitment to fostering research translation, technology commercialization, and the creation of sustainable start-ups through its Centres of Excellence, Industry-Sponsored Labs, and the Centre for Innovators, Entrepreneurs and Commercialization (CIEC), thereby strengthening industrial innovation and regional economic infrastructure.

1.2 Fuelling Innovation: Year-on-Year Growth in Industry-Linked Research.

Progression - Year wise

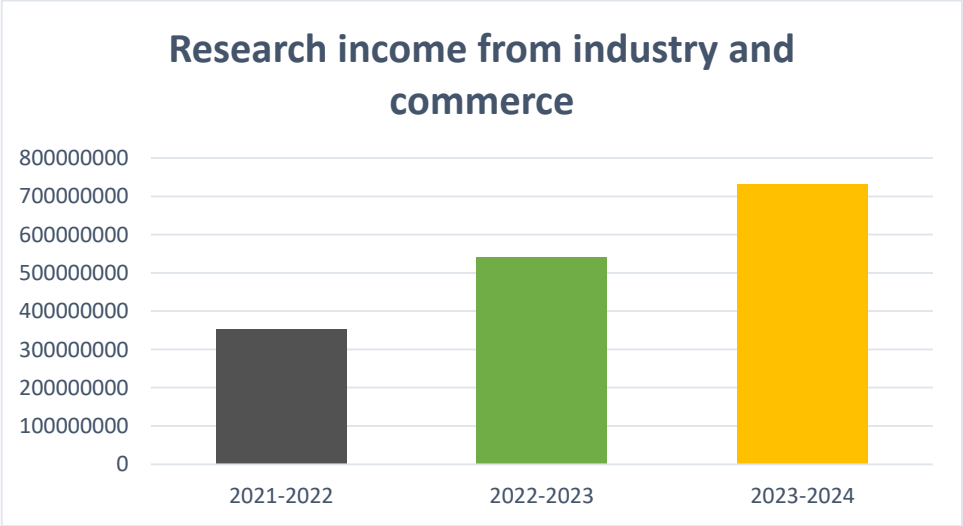
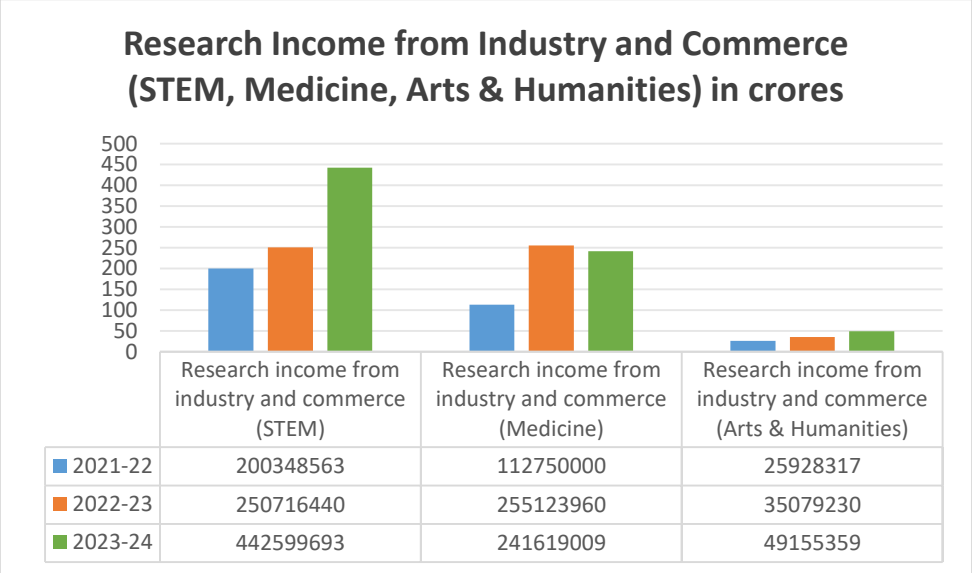


Fig.2 Graph of Research Income from Industry & Commerce

This graph states that highlights a consistent and significant growth in financial support received by the university from industrial and commercial entities over the past three academic years. In 2021–22, the research income stood at approximately ₹35 crore, which increased to ₹55 crore in 2022–23, and further rose to ₹73 crore in 2023–24. This upward trend demonstrates the university's growing engagement with industry, particularly in STEM (Science, Technology, Engineering, and Mathematics) domains. The steady increase in income reflects enhanced trust from the private sector in the institution's research capabilities, its alignment with industry needs, and its ability to deliver innovative, real-world solutions through collaborative research.



	Research income from industry and commerce (STEM)	Research income from industry and commerce (Medicine)	Research income from industry and commerce (Arts & Humanities)
2021-22	200348563	112750000	25928317
2022-23	250716440	255123960	35079230
2023-24	442599693	241619009	49155359

Fig.3 Graph showing Research Income from Industry & Commerce (STEM, Medicine, Arts & Humanities)

The graphs highlight Centurion University's strong and sustained growth in industry-funded research across STEM, Medicine, and Arts & Humanities. Rising STEM income reflects successful commercialization, patent-driven innovation, and socio-economic impact. The sharp increase in medical research funding underscores expanding partnerships with healthcare and pharma sectors, emphasizing translational and industry-driven outcomes. Meanwhile, the surge in Arts and Humanities funding showcases recognition of socially impactful, interdisciplinary research in culture, livelihoods, and community innovation. Together, these trends demonstrate the university's growing role in bridging academia with industry to drive innovation, real-world applications, and inclusive development.

1.3 Expanding Expertise and Academic Capacity to Drive Innovation and Sustainable Growth."

"Year-on-Year Growth in Academic Staff by Subject Area"

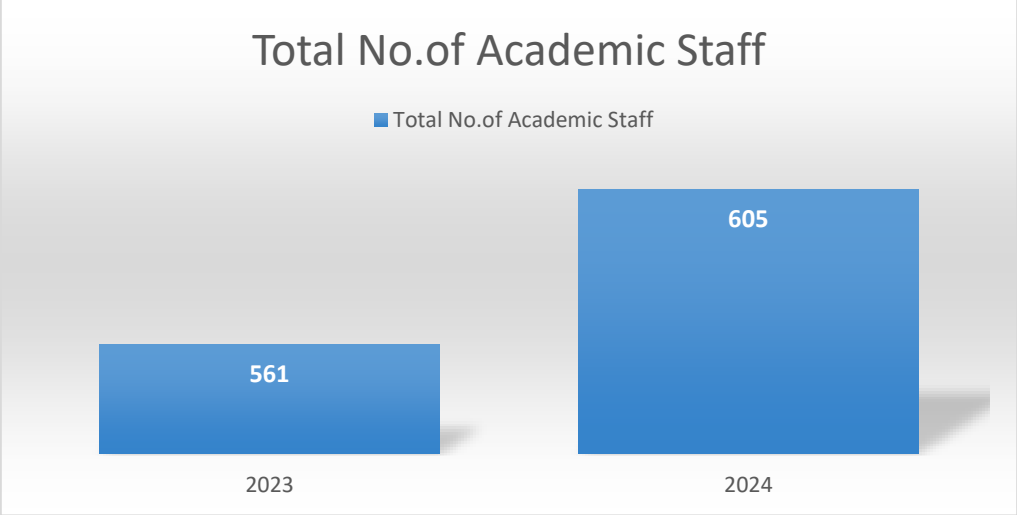


Fig.4 Graph Showing Total No. of Academic Staff (2023 & 2024)

The chart depicts a steady growth in the total number of academic staff at Centurion University, increasing from 561 in 2023 to 605 in 2024. This rise demonstrates the University's sustained commitment to investing in human capital to strengthen its innovation and research ecosystem, in alignment with Sustainable Development Goal 9 (Industry, Innovation, and Infrastructure). By expanding its cadre of qualified educators and researchers, Centurion University continues to enhance its capacity to deliver cutting-edge, industry-relevant education, promote interdisciplinary innovation, and advance the development of sustainable technologies that contribute to regional and national development.

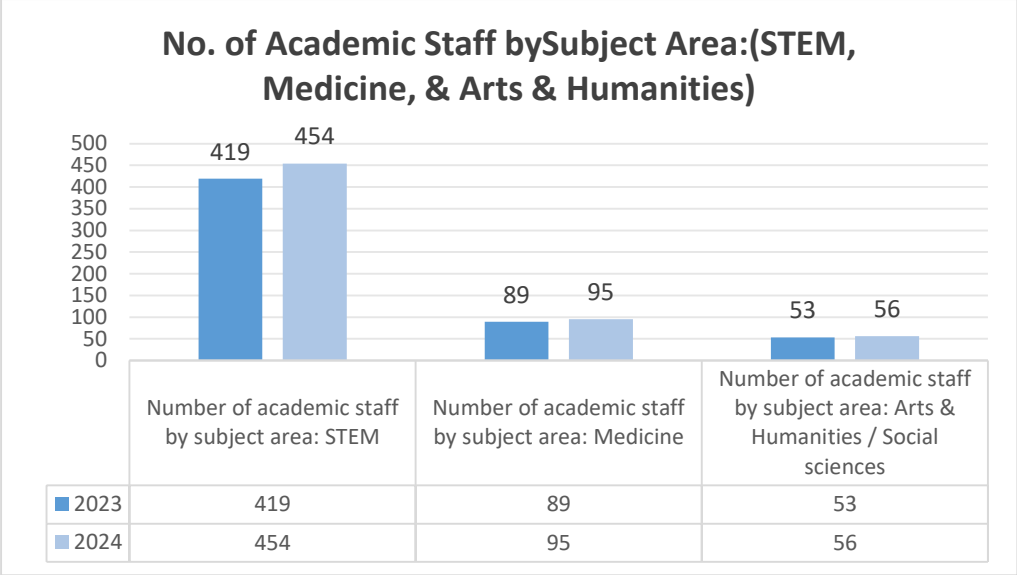


Fig.5 Graph shows No. of Academic Staff by Subject Area

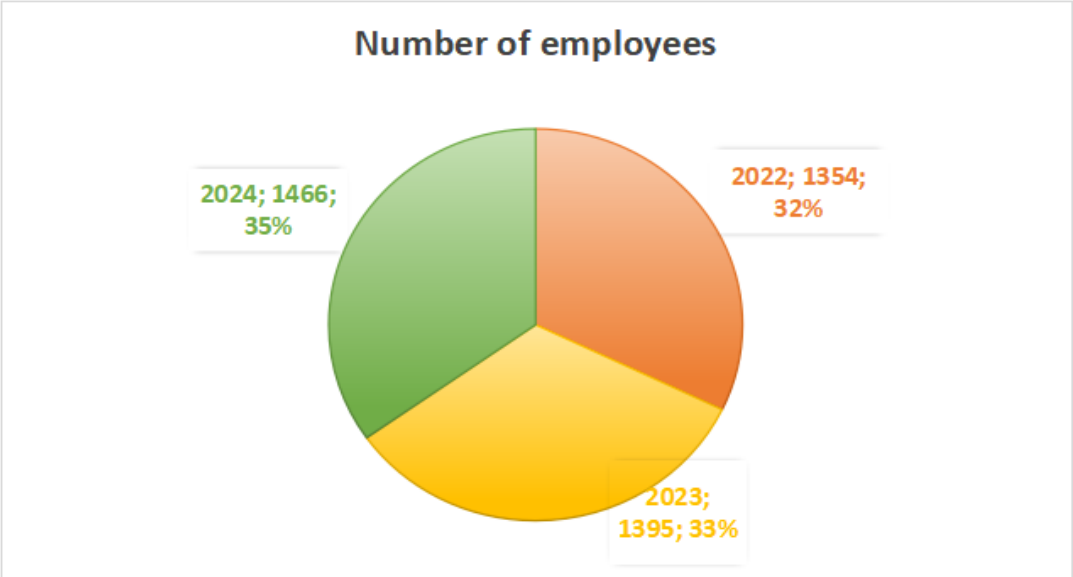


Fig.6 Pie chart showing no. of Employees (2022-2024)

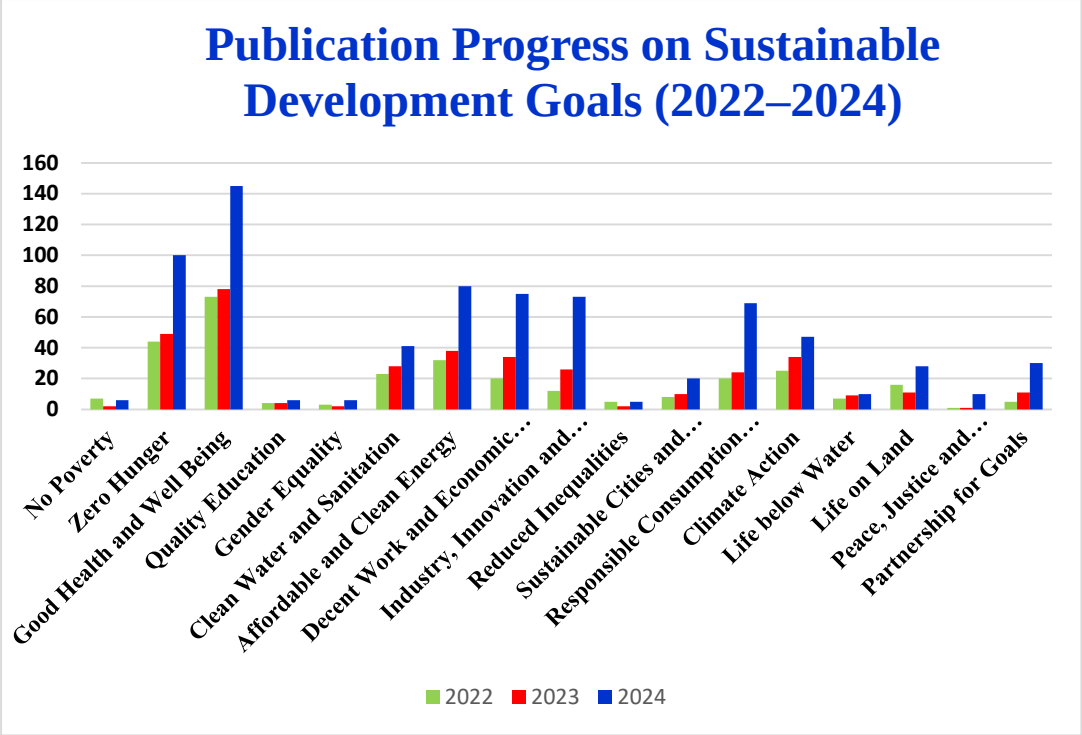


Fig. 6(a) Graph showing publication progress on SDG s(2022-2024)

2. Community outreach through incubation & social entrepreneurship

2.1 Centurion- Gram Tarang

With roots in a skill development program started by Centurion University in 2006 to place jobless tribal youth in Gajapati, Gram Tarang was formally incorporated in 2009 and chosen as one of the National Skill Development Corporation's inaugural partners in 2010.

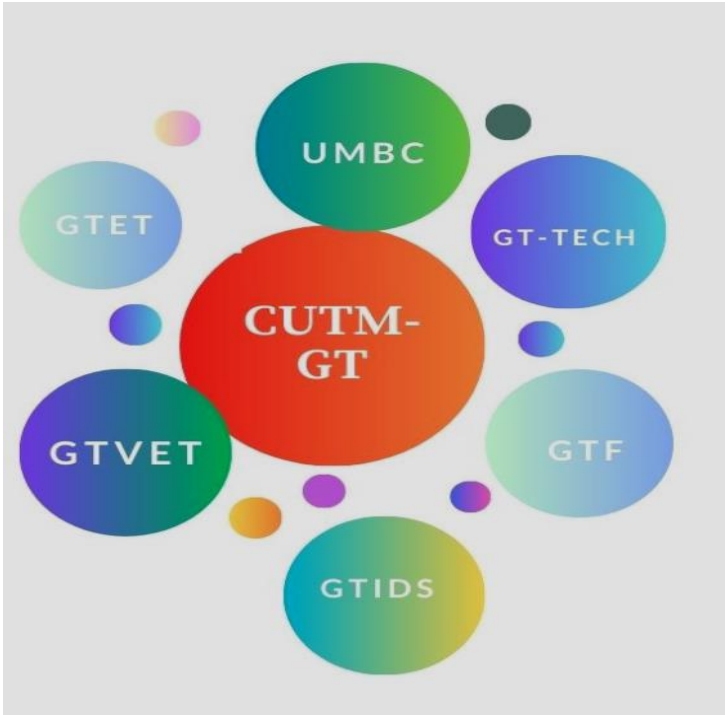


Fig. 7 The University- GT Entities

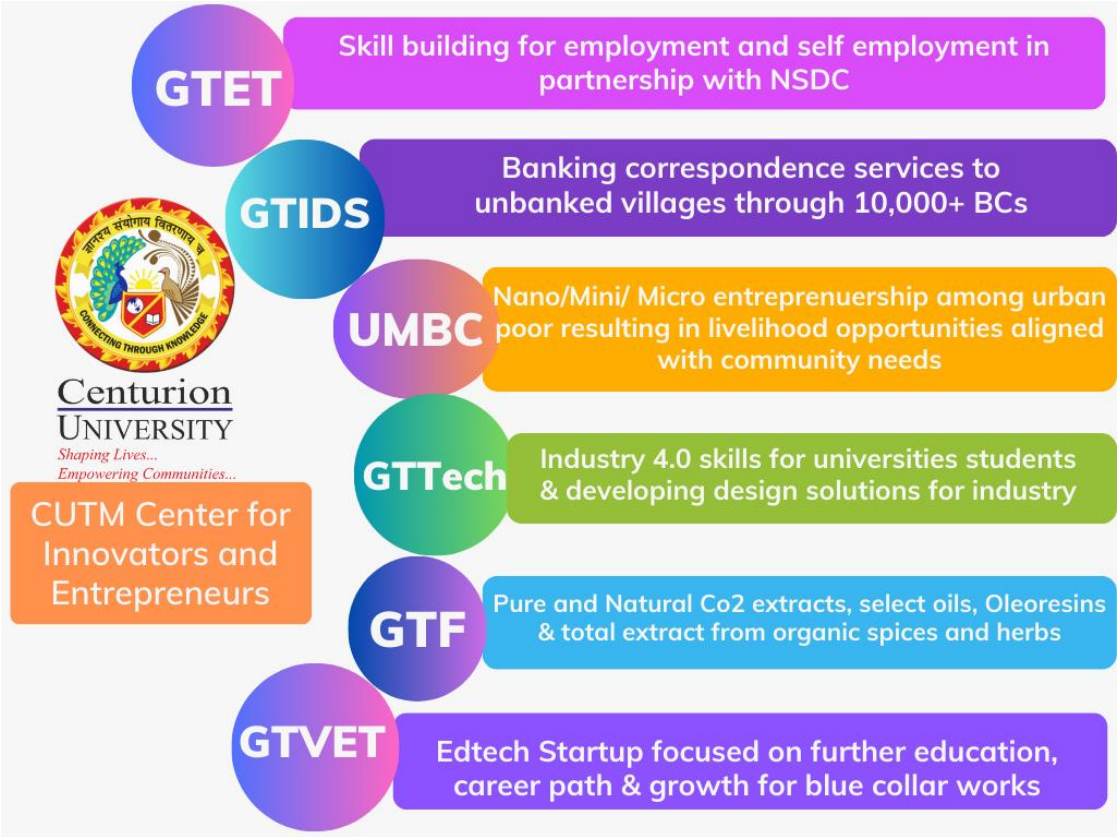


Fig. 8 The University GT Entities and its focus

2.1 Gram Tarang Employability Training Services Pvt Ltd (GTET)

Since its founding, GTET has trained 300,000 youth at 32 locations in Odisha, AP, Jharkhand, Assam, and Punjab. Its overarching goal is to get 100,000 or more youth employed annually.

- **Comprehensive Skill Development Model**: GTET operates 5 large centers offering long-term courses (ITI, Diploma, D. Voc., B.Voc) in fields like Mechanical, Electrical, Automotive, Mining, Hospitality, and Healthcare, along with smaller centers for short-term placement-linked training in various trades.
- **Industry Collaboration**: It runs joint skill development programs with leading companies like Ashok Leyland, Yamaha, Schneider, Godrej & Boyce, and Cafe

Coffee Day, providing practical, hands-on learning in industry-specific labs and workshops.

- **High Placement Rate**: GTET's focus on experiential learning and strong industry involvement ensures a placement rate of over 80%, with trainees securing jobs in more than 200 companies across India.
- **Inclusive Education**: Over 50% of the trainees are from scheduled castes and tribes, 40% are women, and there are special programs for the differently abled, ensuring an inclusive approach to skill development.
- **Awards and Recognition**: GTET has been recognized as the Best Skill Provider by NSDC multiple times and was honored by FICCI as a top skill provider for 3 consecutive years at global skills summits.

- **Production**

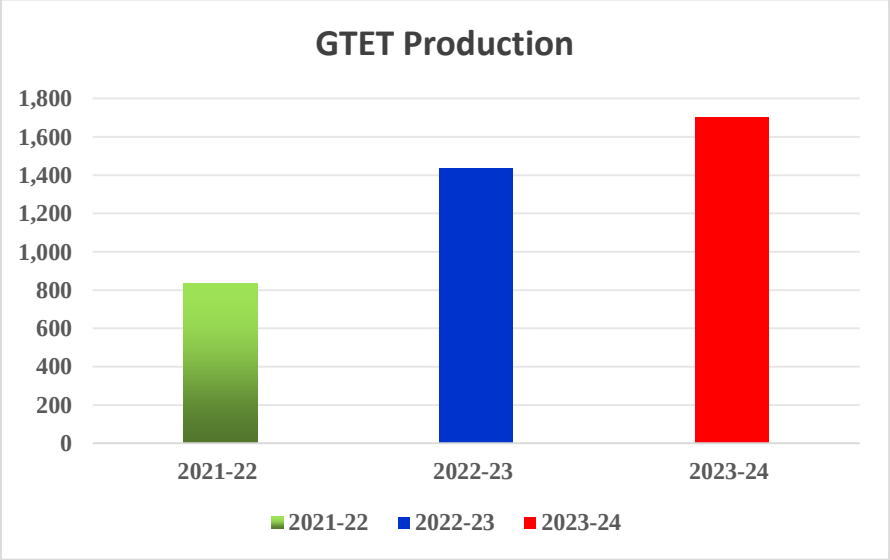


Fig. 9 GTET Production year wise

2.2 Gram Tarang Inclusive Development Services Pvt Ltd. (GTIDS)

GTIDS is a social entrepreneurial outreach initiative of the University. It was started in 2011 to provide access to much-needed financial services in some of the remotest parts of India. Lack of these formal financial services has been identified as a major development impediment in multiple studies done on the subject.

- **Extensive Agent Network and Financial Inclusion:** GTIDS recruited over 8,500 agents across 25,000 villages in 14 states, facilitating the opening of over 1.6 crore no-frills accounts and mobilizing significant savings and fixed deposits.
- **Microfinance and Loan Disbursement**: GTIDS disbursed over INR 400 Crores in microfinance loans to 1,60,000 beneficiaries under the government's Mudra Scheme, supporting financial access for underserved communities.
- **Banking Services Provider**: As a principal services provider for five banks, GTIDS employs 1,500 agents to offer banking services like withdrawals, savings, insurance policies, and NPA recovery to 500,000 beneficiaries.
- **Fintech Innovation**: GTIDS developed the Insta Money app, empowering local businesses to offer Aadhaar banking, loans, and digital payment services, strengthening its position in the fintech sector.

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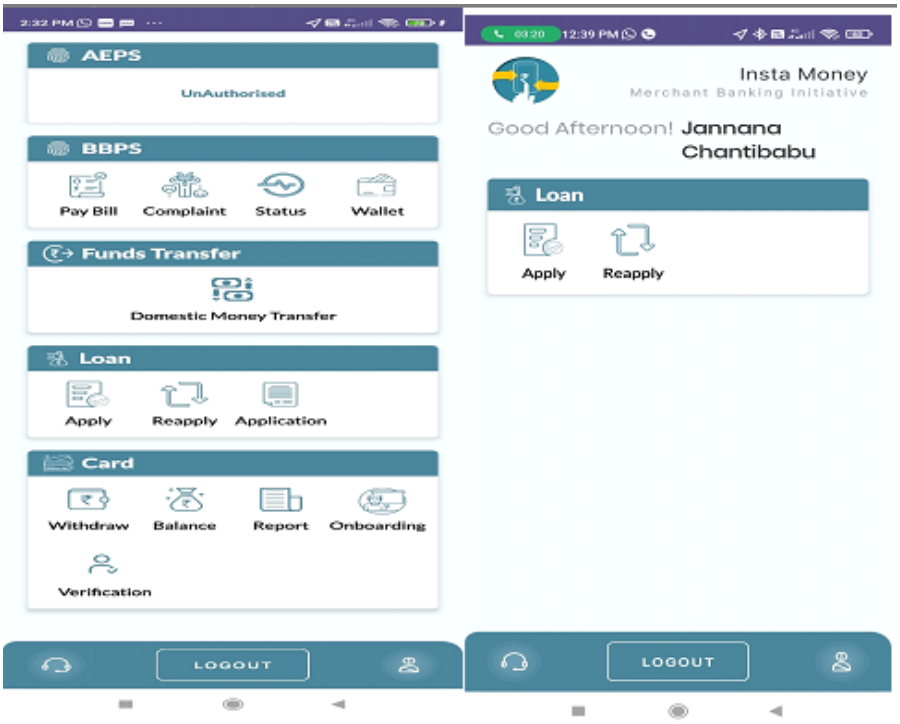


Fig. 10 Insta-Money App

Fig. 11 Interaction regarding Instamoney

- **SUPERBEE Aeronautics Pvt Ltd:**

SUPERBEE Aeronautics Pvt Ltdis at the forefront of advancing drone technology through a relentless commitment to innovation and excellence.

- **Innovative Drone Technology**: SUPERBEE Aeronautics focuses on advancing drone technology with a system-level design approach, addressing complex aerospace challenges through innovative solutions.
- **Commitment to Quality and Sustainability**: Quality is central to SUPERBEE's operations, as they strive to transform industries and support

sustainable development through purpose-driven, indigenous design and development solutions.

- GTIDS is operating 37 Agriculture Drone Clusters across 7 states of India, deployed 168 Agriculture Drones and sprayed over 2 Lakh acres in the last 3 years. Other Drone related initiatives are as follows.
  - ✧ Rotorcraft RPAS Small Pilot Training by East India's first Directorate General of Civil Aviation- authorized Remote Pilot Training Organization (RPTO) at Centurion University's Paralakhemundi campus. So far, the RPTO has trained and produced over 200 pilots since its inception in March 2024.
  - ✧ Drone & Hydrographic Survey for rejuvenation of 75+ water bodies in Bhubaneswar city for Bhubaneswar Municipal Corporation & for various municipalities, NACs across Odisha.
  - ✧ RGB Survey of Agriculture Lands in Andhra Pradesh, Uttar Pradesh.

Fig. 12 Medicine spraying using Drone

सत्यमेव जयते

GOVERNMENT OF INDIA
MINISTRY OF CORPORATE AFFAIRS

Central Registration Centre

Certificate of Incorporation

[Pursuant to sub-section (2) of section 7 and sub-section (1) of section 8 of the Companies Act, 2013 (18 of 2013) and rule 18 of the Companies (Incorporation) Rules, 2014]

I hereby certify that SUPERBEE AERONAUTICS PRIVATE LIMITED is incorporated on this TWENTY FOURTH day of MAY TWO THOUSAND TWENTY FOUR under the Companies Act, 2013 (18 of 2013) and that the company is Company limited by shares

The Corporate Identity Number of the company is **U26515OD2024PTC045918**

The Permanent Account Number (PAN) of the company is **ABNCS5230K***

The Tax Deduction and Collection Account Number (TAN) of the company is **BBNS15206C***

Given under my hand at Manesar this TWENTY FOURTH day of MAY TWO THOUSAND TWENTY FOUR

Signature Not Verified
Digitally signed by
DS MINISTRY OF CORPORATE AFFAIRS , CRC MANESAR 1
Date: 2024.05.25 16:54:29 IST

PRAMOD MEENA

Assistant Registrar of Companies/ Deputy Registrar of Companies/ Registrar of Companies

For and on behalf of the Jurisdictional Registrar of Companies

Registrar of Companies

Central Registration Centre

Disclaimer: This certificate only evidences incorporation of the company on the basis of documents and declarations of the applicant(s). This certificate is neither a license nor permission to conduct business or solicit deposits or funds from public. Permission of sector regulator is necessary wherever required. Registration status and other details of the company can be verified on mca.gov.in

Mailing Address as per record available in Registrar of Companies office:

SUPERBEE AERONAUTICS PRIVATE LIMITED

C/O-THE PRINCIPAL ITOT, (CUTM), RAMACHANDRAPUR, Jatni, Jatni, Khorda- 752050, Orissa

*as issued by Income tax Department

- **Production**

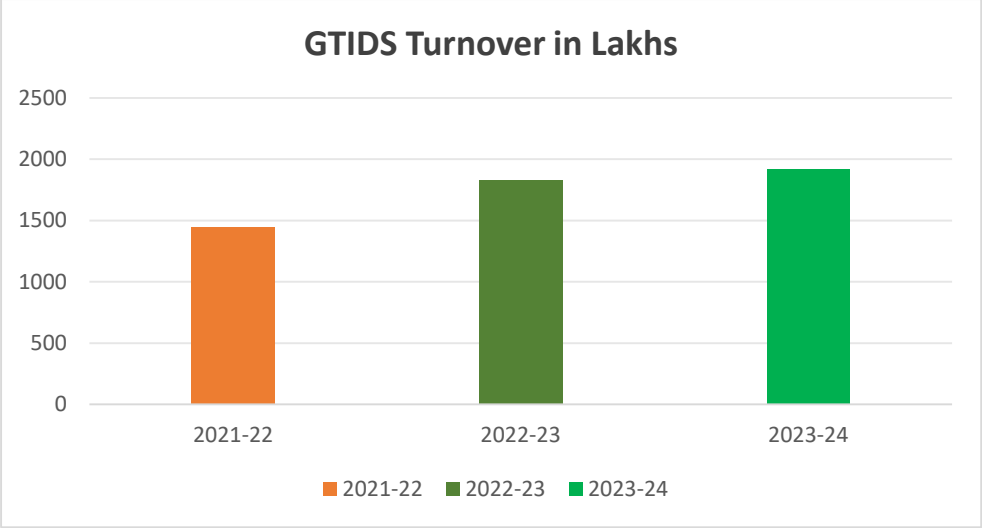


Fig.13 GTIDS Turnover

2.3 Urban Micro-Business Center (UMBC)

Urban Micro Business Center is a not for profit company created by Centurion University as its social outreach in urban slums focusing on creation of nano/mini/micro entrepreneurs. The unit was setup in partnership with Bhubaneswar Municipal Corporation and is a 5000 sq ft multi activity center located at Kargil basti.

- **Entrepreneurship Development**: UMBC has identified and trained 220 potential entrepreneurs from poor families in Bhubaneswar slums to start nano businesses.
- **Support for Women Entrepreneurs**: It provided zero-interest loans to 150 women through bank linkages, fostering financial independence.
- **Bakery Unit and Buy-Back Program**: In collaboration with OMFED, a bakery unit was set up with a formalized buy-back arrangement for its products.
- **Research and Learning Hub**: The center serves as a platform for students and faculty from institutions like Centurion University, RMIT, and University of Queensland for research and learning.
- **Sustainable Creche**: A self-sustaining creche for pre-school children was established in 2021 under an Australian Alumni Grant.

Fig. 14 UMBC working Details

2.4 Gram Tarang Technologies Pvt. Ltd. (GT Tech)

Gram Tarang Technologies Pvt. Ltd. (GT Tech) is a technological firm incubated within Centurion University. It is a private limited company incorporated on 13 August 2018 and based in the states of Andhra Pradesh and Odisha, whereas, has operations across India.

- **Focus Areas**: Gram Tarang Technologies (GT Tech) develops innovative digital products and solutions across sectors like agriculture, mining, and architecture engineering construction (AEC) for government, private, and educational clients.
- **4th Industrial Revolution Technologies**: GT Tech integrates advanced technologies like augmented reality, robotics, 3D printing, automation, and AI to digitize organizations and stay competitive globally.
- **Partnerships**: GT Tech collaborates with companies such as Dassault Systems, Aarav Unmanned Systems, and AMS to deliver engineering services, design solutions, and support niche technologies.
- **Agriculture Training and Innovation**: GT Tech provides virtual reality training to farmers and supports agricultural advancements such as

vermicomposting using digital simulations, impacting 10,000 farmers across Andhra Pradesh.

- **Dedicated Team**: With a team of 130 engineers specializing in mechanical, civil, and software disciplines, GT Tech delivers comprehensive technology solutions across multiple sectors.

Fig. 15"Knowledge on Wheels- Farmer's Experience Zone"

- **Production GT-Tech**

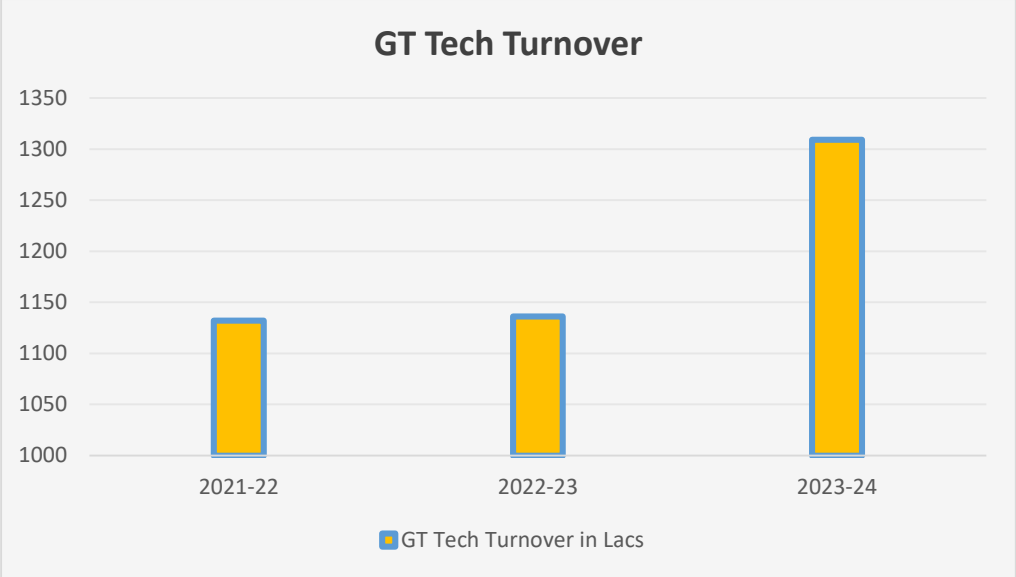


Fig. 16 GT-Tech Turnover

2.5 Gram Tarang Foods:

Gram Tarang Foods is a Social Entrepreneurship Outreach Entity of Centurion University dedicated to producing phyto extracts (Select Oils, Oleoresins and Total Extracts) from raw, organic spices, herbs and flowers.

- Product portfolio includes Flavour, Fragrance and Colour extracts from Ginger, Turmeric, Vanilla, Pepper, Vetiver, Tulsi, Paprika and more.
- Non-Toxic, Non- Flammable, Clean and Green, Made in India Plant and Machinery on Globally accredited Technology Platform with Substantial Scope of Scalability, both, horizontally and vertically.
- Value additions will happen at the local level instead of just selling raw product with a plan to institute research for low cost organic production and introduction of new corps like patchouli.

Fig. 17 Flavour, Fragrance and Colour extracts from Ginger

- **Sustainable Livelihoods for Rural Communities**: The enterprise focuses on empowering rural, especially women, by processing and marketing locally sourced food products like spices, herbs, medicinal plants, and flowers.
- **Collaboration and Market Support**: Its research scientists collaborate with farmers to develop sustainable extraction methods, while supporting market access, local development, and value addition for farmers through its campus facilities.

.

With businesses like Himalaya, Naturals, and Robertet, we empower Rural Communities, Promoting Local Agriculture, Generating Employment Opportunities.

2.6 Gram Tarang Vocational Education and Training (GTVET)

Gram Tarang Vocational Education and Training (GTVET) is an integral part of Centurion University . It is focused on delivering high-quality vocational education and skill development programs tailored to meet the needs of various industries and communities.

The primary mission of Gram Tarang Vocational Education and Training (GTVET) is to bridge the gap between education and employment by offering industry-aligned vocational training. The objectives include:

- **Enhancing Employability:** To equip students with skills that make them job-ready and capable of securing employment in various sectors.
- **Promoting Inclusive Growth:** To provide skill development opportunities to marginalized communities, including women, rural youth, and school dropouts.
- **Supporting Economic Development:** To contribute to the socio-economic development of regions through skill-building and employment generation.
- **Diverse Range of Courses:**
    - Courses offered by Gram Tarang are certified by recognized bodies such as the NCVET, National Skill Development Corporation (NSDC) and Sector Skill Councils (SSCs).
    - The certifications are valued by employers, enhancing the employability of graduates across India and abroad.
- Skill Development and Employment: GTVET has trained thousands, helping graduates secure well-paying jobs, start businesses, or pursue further education, thereby improving livelihoods and employability.

- **Industry Partners**

Fig. 18 Digital Product Development in partnership with Dassault Systems

Centurion University is one of the leading skill universities of India. Its unique model lays specific emphasis on creating sustainable livelihoods in challenging geographical and rural demographics through education that results in employability and kindles entrepreneurship. This model has been applauded by the Government of Odisha, Government of India policy Think-Tanks such as the NITI aayog and many leading international organizations such as the United Nations, UNESCO, World Bank, British Council among others. Centurion University incubated 52 startups in the year 2022 which has increased to 74 startups in 2024.

- Centurion University is committed to advancing Sustainable Development Goal 9 (SDG-9) which focuses on building resilient infrastructure, promoting inclusive and sustainable industrialization, and fostering innovation..

- Centurion University has been recognized as a “Centre of Excellence” by the Ministry of Skill Development and Entrepreneurship (MSDE), Government of India. The education model that Centurion University follows domain specific industry linked delivery structure and evaluation process in its education model.

2 Centre for Innovators, Entrepreneurs and Commercialization (CIEC)

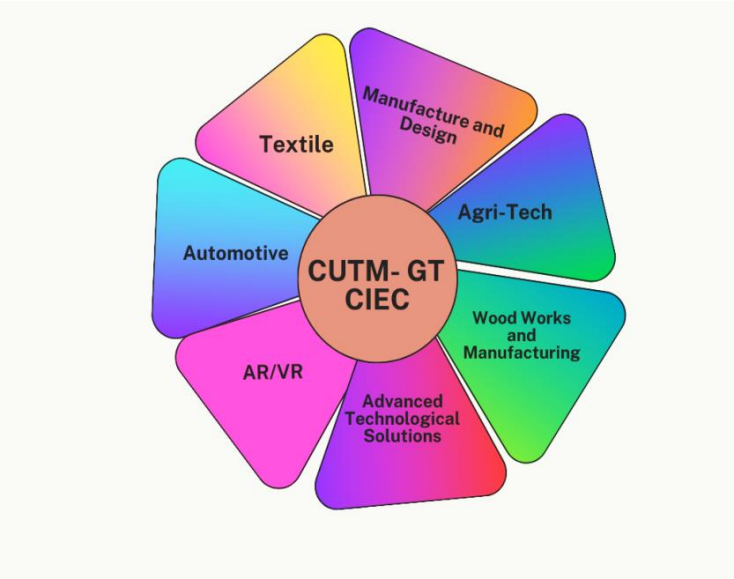


Fig.19 Centurion University-GT CIEC

CIEC is an incubator for nano and micro enterprises. It leverages Centurion University's industry level production facilities/labs, 3D printing infrastructure, digital design lab and research outputs created by various research centres to encourage and nurture entrepreneurs. CIEC is supported by the Government of Odisha "Start-up Odisha" program and a network of mentors. Under its aegis, Centurion University has partnered with FICCI-FLO (Federation of Indian Chambers of Commerce and Industry's Women Wing) for a specifically Women entrepreneurs targeted program in Odisha..

CIE (Centre for Innovators and Entrepreneurs) is sector agnostic and welcomes applications from all sectors in any stage.

To name a few sectors –

- Agriculture & allied fields
- Healthcare
- Education & Skill Development
- Alternate Energy
- Waste Management

- Art & Craft
- Fashion & Retail

Fig.20 University- Industry Symbosis

- **Startups of Centurion University**

Name of start-up	Area	Important clients
GT-Transformer	Transformer manufacturing	Govt. of Odisha
Skyy Rider Automotive, Pvt Ltd	E-Rickshaw, E- Vehicle	OMFED, Govt. of Karnataka, Centurion University, Bhubaneswar Municipal Corporation
Likhan Ecofriendly pen	Eco-friendly pens	Bhubaneswar market, to be listed in Amazon
Susmita enterprises	Apparel manufacturing	Market of Odisha and India

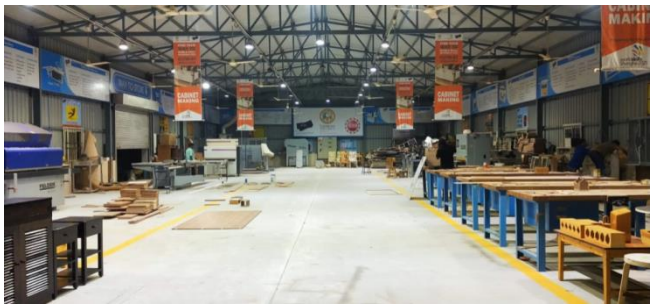
Centurion woodworks	Furniture manufacturing	Market of Odisha and India

Some of the Venture/Startup/SME Unit Established with the Support of Higher Education Institutions (HEI) are as follows:-

- Centurion Fab,Centurion MechTech,Gram Tarang Garments,Centurion Gram Sanjeevani, Futurator India Private Limited, Jivada Ventures, Searchingyard Software,Yardhealth Innovation and Research,RR Agro, Sangam Designs, and Vastalya Wellness

3.1 Wood Engineering

3.1.1 Introduction



Woodwork Learning Lab is one of the leading furniture manufacturing labs in Odisha today, providing complete furniture solutions for all segments through its strong manufacturing base. Our expertise lies in extremely innovative and cost-effective customized office furniture, modular workstations, student desks, conference tables, chairs, educational, and laboratory retail furniture.

The Wood Engineering Production Centre at Centurion University is a dynamic hub that fosters hands-on, experiential-based learning. Over 650 differently-abled students have gained valuable skills in Wood Engineering, apparel manufacturing, and Coffee brewing through this initiative.

Fig.21 Wood Engineering Works

Fig.22 Carpentry Workshop

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Some of the woodwork setups are presented as follows:-

Fig.23 Setup at Nexus 4.0 (Centurion University Bhubaneswar)

Fig.24 Setup at Centurion University

Fig.25 Setup in Class room and Labs, Centurion University

3.1.2 Production

The Wood Engineering Unit works hard to maximize the use of the existing resources and minimize waste with its innovative methods and infrastructure. This Unit has

worked on various ways to upcycle waste material into exciting and practical designs of furniture for in-house use as well as for the market. The future lies in reducing waste and ensuring that every effort applied is towards the sustainability of the planet.

Fig.26 Wood Work Production Year Wise

3.2 Apparel Manufacturing Lab

- **Skill Development for Marginalized Youth**: Centurion University, an accredited Skill University, has trained 300,000 youth from challenging backgrounds, including marginalized communities and differently-abled individuals, across several states in India.
- **Leading Apparel Manufacturing Solutions**: The University established the Apparel Manufacturing Lab at Parlakhemundi in 2014 and expanded with advanced technology at Bhubaneswar in 2016, becoming a leading provider of innovative, cost-effective apparel solutions, including industrial and medical garments.

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Fig.27 Different Machines in Apparel Lab

Fig.28 Student Working in Labs

Some of the advanced machines are used in Apparel Manufacturing are as follows:-

Fig.29 Advanced Sewing Machine &15 Needle Embroidery Machine

Fig.30 Fusing Press & Cloth Cutting Machine

- **Sustainable Production Practices**: The Apparel Manufacturing Unit employs waste-to-wealth principles, maximizing resource use and upcycling waste materials into commercially valuable products, ensuring minimal waste throughout the production process.
- **Empowerment and Environmental Awareness**: By fostering economically productive citizens who earn livelihoods with dignity, the unit also promotes awareness of the importance of environmentally friendly manufacturing practices, contributing to a sustainable ecosystem.

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3.2.1 Production

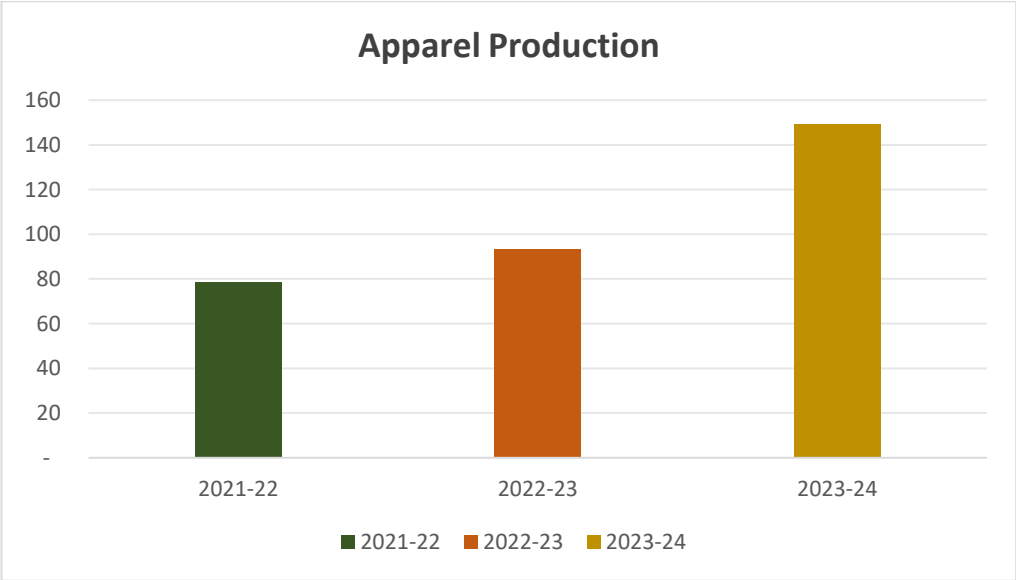

Fig.31 Graph of Apparel Production Year wise

3.3 Transformer Unit: Manufacturer and Repairer of all kinds of Transformers

- **Advanced Training in Energy Sector**: Gram Tarang established a state-of-the-art transformer manufacturing and repair workshop to focus on vocational training in the energy sector, meeting national and international standards and serving various discoms and private clients.
- **Comprehensive Educational Support**: Launched in August 2017, the Transformer Unit supports student projects by providing training in manufacturing, testing, and design, positioning Centurion University as a pioneer in transformer manufacturing in eastern India.
- **Skill Development for Workforce Readiness**: The Transformer Manufacturing Unit has trained over 600 students and professionals to address the skilled labor shortage in the power sector, equipping them with the technical expertise needed for careers in energy companies and transformer manufacturing firms.

.3.3.1 Products

The most important part of the transformer is testing and evaluation, which are conducted using high-precision testing equipment with the best accuracy from leading equipment manufacturers in India. Centurion University Transformer Testing Laboratory basically revolves around transformer design, manufacturing, QC, and Maintenance. Development and supply of the distribution transformers from 10KVa to 1MVA of M3 grade core or better than that. The capacity of the unit is from a few KVA to hundreds of MVA.

Fig.32 Transformer Unit Workshop

Fig.33 Different Types of Machine in Tranformer Unit

3.3.2 Production

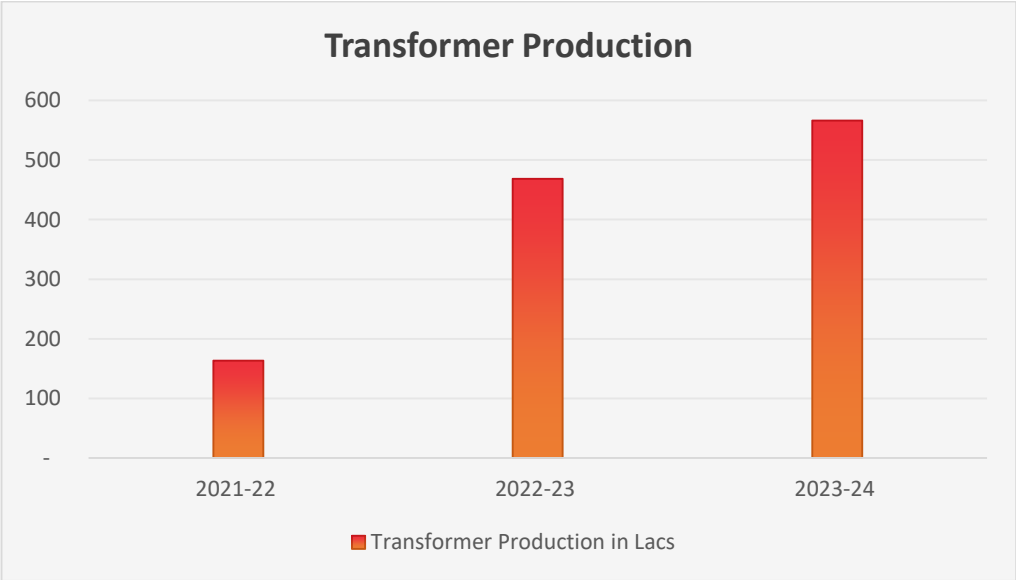

Fig.34 Graphical Presentation of Transformer Production Year Wise

3.4 Electrical Vehicle Manufacturing Unit

A student of Centurion University, Nihar Ranjan Panda and his team, introduced a skill-training institute, Skyy Rider which commenced as the Electric Vehicle (EV) Manufacturing Unit with the belief in the power of electric mobility to transform the world. Having the upper hand at being the first-mover advantage in Odisha, it eched its mark in being the only brand developing, innovating, and supplying EVs at an economical rate. Additionally, increasing fossil fuel prices also helped penetrate the market.

- **Innovative Electric Vehicle Production**: The Electrical Vehicle Manufacturing Unit aims to transform the transportation industry by creating

sustainable and affordable electric vehicles, emphasizing stylish and functional designs that cater to modern consumer needs.

- **Hands-On Student Engagement**: The unit actively involves students in the manufacturing process, providing comprehensive training on electric vehicles and their latest trends, enhancing their employability, and bridging the gap between theoretical knowledge and practical application.

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Fig.35 Electric Vehicles

Fig.36 EVs inauguration of refrigerated Carts

3.4.2 Production:-

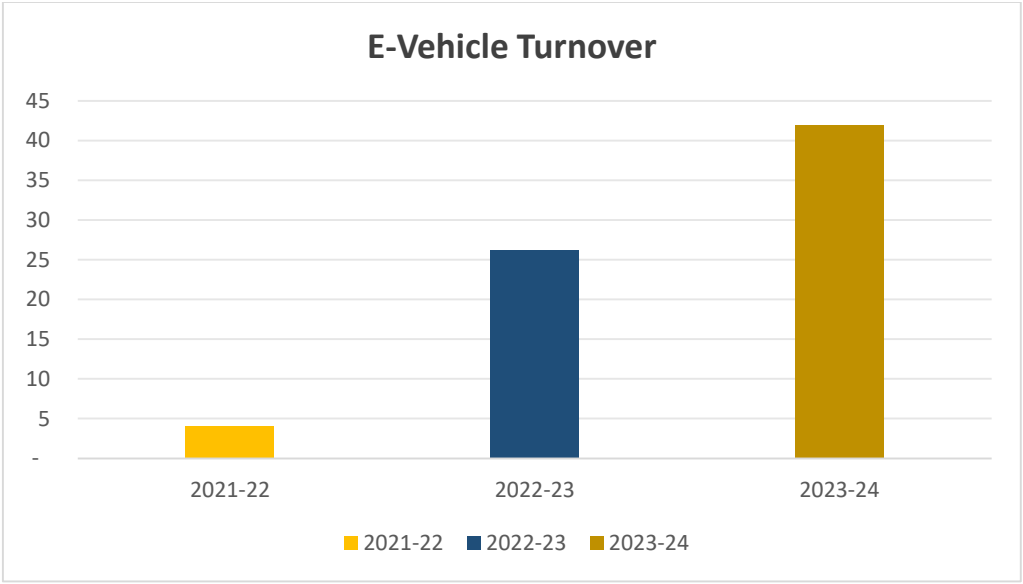

Fig.37 Graph of EVs Production Year Wise

4 Waste to Wealth

- **Sustainable Waste Management**: The "Waste-to-Wealth" initiative converts waste into valuable products like biogas, biofuels, and fertilizers, promoting sustainable development while generating income and improving rural livelihoods, health, and food security.

- **Commitment to Sustainable Production**: Centurion University's 'Waste-to-Wealth Lab' focuses on eco-friendly manufacturing of various products, aligning with Sustainable Development Goals by minimizing waste and fostering responsible citizenship among students and the community.

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Fig.38 Recycling Materials

4.1 Pavers Manufacturing Unit

Pavers Manufacturing Unit commenced on 14 November 2011, to develop student learning. Besides skill integration, the pavers manufacturing Unit has resulted in the enactment of several Centre of Excellence as it serves as a state-of-the-art learning facility and action learning laboratory. Learning at Centurion University is also accomplished in Action Learning Labs and Production Centers. Production Centers cater to the manufacturing of products and services besides engaging students in action learning.

4.1.1 Products

The manufacturing of pavers includes a variety of shapes and sizes which are used as per the requirements. The designs range from hexagonal, square, and rectangular to zig-zag and many more.

Fig.39 Concrete Pavers Unit

Fig.40 Different types of Pavers

4.2 Paper Production Unit

- **Eco-Friendly Paper Production**: Established in June 2017, the paper production unit recycles discarded papers and cloth wastes from the University and apparel unit, creating handmade paper without chemicals, thus promoting sustainable and eco-friendly practices.
- **Cost-Effective and Waste Reduction**: The unit produces affordable paper sold to government offices and private institutions, significantly reducing waste generated by the University while minimizing the environmental impact of traditional paper production.

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Fig.41 Different type of Products from Paper Production Unit

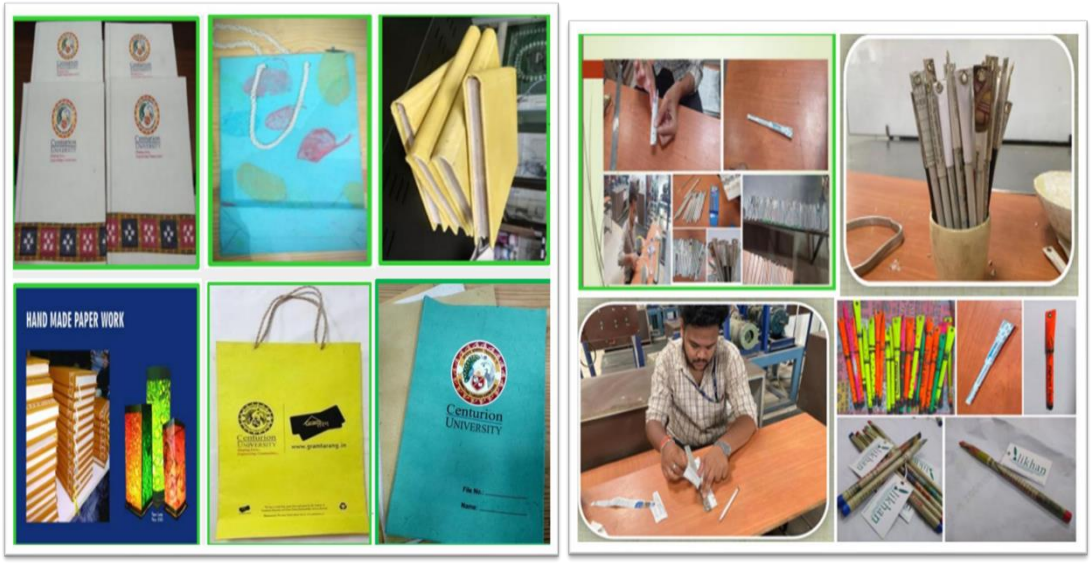

Fig.42 Handmade Paper Work

4.3 Ceramics Pottery Production Unit

The Centurion University strongly emphasizes art and design, including terra cotta products. Terra cotta products are ceramic materials made from clay and other natural materials, often used in architectural and decorative applications.

- The university's programs might focus on designing, developing, and manufacturing terra cotta products, teaching students about their cultural significance, historical uses, and modern applications in construction, sculpture, and other fields. This could include ceramics, sculpture, and architectural design courses.

Fig.43 Different products from Pottery Production Unit

4.4 Biofertilizer Production Unit

The Centurion University's Biofertilizer Production Unit is a research facility focused on developing eco-friendly and sustainable agricultural practices.

- **Sustainable Agriculture Focus**: Centurion University's Biofertilizer Production Unit develops eco-friendly biofertilizers using microorganisms to enhance plant growth and reduce reliance on harmful chemical fertilizers, supporting sustainable agricultural practices.
- **Improved Crop Yields**: The unit's research aligns with the university's vision to improve rural livelihoods by producing biofertilizers that enhance crop yields while minimizing environmental degradation.
- **Training and Capacity Building**: The Biofertilizer Unit provides extensive training programs to educate farmers on effectively using biofertilizers and related technologies, ensuring they maximize the benefits of these sustainable products.

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Fig.44 Different Biofertilizers

4.5 3D Printing

The 3D Printing Lab at Centurion University was established in January,2020 and 3D printing Lab is a part of GT Tech, a broader initiative within the university that focuses on integrating advanced technologies and fostering innovation across various domains . The Aim and Objective of 3D Printing Lab are as Follows:-

- ✧ Hands-on experience in 3D printing technology.

- ✧ Encourages students to experiment with new designs and ideas, fostering creativity and innovation across various disciplines such as engineering,healthcare, and architecture.
- ✧ Supporting Research and Development and Facilitating Interdisciplinary Collaboration.

Fig.45 3D Printing Lab

4.6 AR/ VR Lab

- **Innovative Learning Environment:** The AR/VR Lab at Centurion University is a cutting-edge facility designed to explore and advance Augmented and Virtual Reality, providing students and faculty with the resources needed to engage in innovative research and development.
- **Diverse Applications and Collaboration:** The lab supports a wide range of projects, including educational tools, medical simulations, architectural visualizations, and entertainment, fostering hands-on learning and collaboration across various fields.
- **Preparation for Industry Needs:** By bridging the gap between academic learning and industry requirements, the lab equips students with essential skills for careers in the rapidly evolving AR and VR sectors, promoting experiential learning and potential entrepreneurial ventures..

Fig.46 Workshop of AR/VR

Infrastructure

Centurion University's campuses comprise of all the requisite infrastructure and facilities to cater to the needs of the residents and visitors.

- The academic facilities comprise of library, lecture theatres, conference and meeting rooms. Residential facilities include quarters, guest houses and hostels. Central mess and guest house dining rooms cater to the residents.
- A dedicated restaurant and market complex provides customized healthy food options for students.
- Sports and fitness are given utmost importance, and it includes gymnasiums, open gymnasiums, cricket fields, volleyballcourts, and basketball court.
- A dedicated swimming pool is open for students and staff members.
- Ayurveda Wellness Centreprovides naturopathy and specific massage treatment, healthcare facilities on campus include both primary and secondary medical care at the Community Diagnostics Center.

- The University ensures the highest degree of safety and zero tolerance towards pollution of any kind and all of its campuses are honk-free and adhere to safe speed limits.
- The thriving ecosystem and green campus are boon of clean water and sanitation facilities. It enables the recycling of waste water and the harvesting of rainwater.

We have:-

- 11 Centre of Excellence
- 24 Research Centers
- 30^{+} Live Labs
- 52+ Industry Sponsored Labs
- 138+ MOUs and Collaboration

Fig.47 Lab of Centurion University

5 Different Research Centres in Centurion University

It all started in the year of pandemic, 2020. The role of research in academic institutions is significantly for its growth, Development and sustainability. Centurion University is focused on the cutting edge research advancements that makes a differences through appropriate and relevant Innovation.

The University has launched **22 Research Centers** on 15th August,2020 with an aim of promoting research with focus solely on Innovations, Incubation and Entrepreneurship and now it has been increased to 24 research centres.

❖ **Centre for EduTech and Skills Tech**:-

- **Innovative Learning Models**: The Centre for EduTech and Skills Tech is transforming traditional education by integrating technology to create personalized, accessible learning experiences that equip learners for success in the digital age.
- **Focus on Emerging Technologies**: The center explores new frontiers in education through technologies like blockchain and the metaverse, using AR, VR, and 3D learning to help students visualize and analyze complex concepts across various fields such as science, engineering, and agriculture.

Fig.48 Student in 3D Workshop

There are 45 Assets in our 3D Assets, some of them are:-

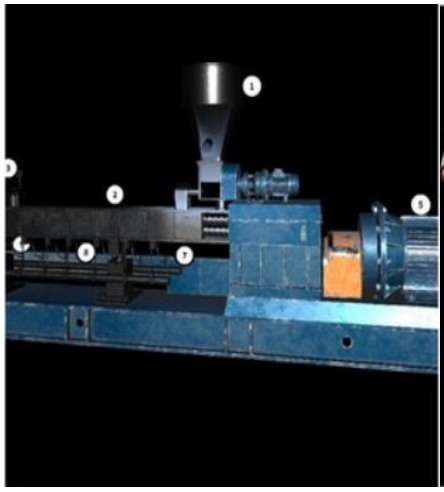


Fig.49 Twin Screw Extruder

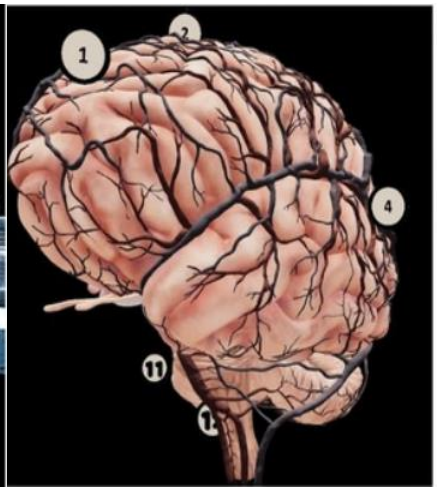


Fig.50 Human Brain Anatomy

Fig.51 Fish Respiration

Fig.52 Muscular System

An MOU was signed with Appearition for adopting immersive learning - Platform, Content, IP and Multiple Apps running at the same time to cater to the needs of students and conducting pilotstudy. The purposes were capacity-building and change management, mentoring the students and faculty in content creation, engaging students in projects and internships.

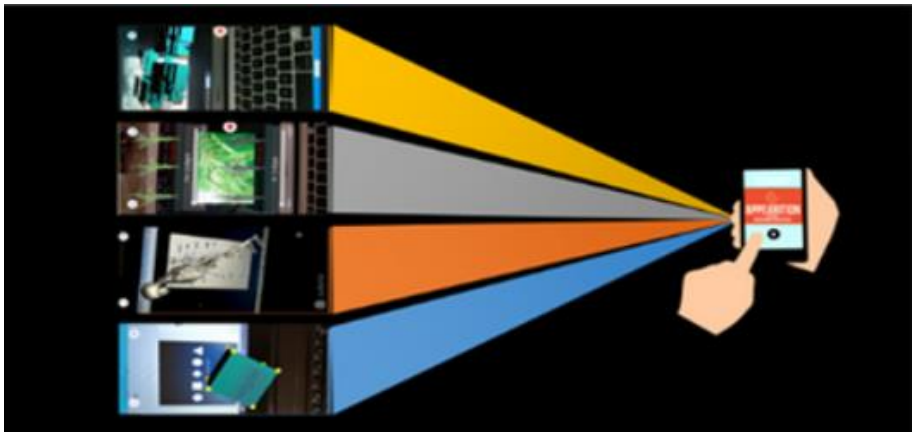


Fig.53 Centurion Apparition Pilot Project (AR & VR)

Fig.54 University Campus on Unity Engine and Connect through the Metaverse

- **Centre for Agriculture Production:-** The centre for Agriculture Production is mainly focuses on production and technology adaption of Various research units. The centre aims to provide learning platforms for students in different units and also adds supports for startups in different units by introducing certificate/Skill courses. The research units in this Research centre are
  - Seed Processing Unit

- ✧ Hybrid Seed Production Unit
- ✧ Mushroom Unit
- ✧ Spawn Unit
- ✧ Bio-Fertilizer Unit
- ✧ Bio-Pesticides Unit
- ✧ Marigold Production & Commercial Nursery Unit
- ✧ Honey Production & Bee Keeping Unit
- ✧ Vermicompost Unit
- ✧ Tulsi & Mentha Production Unit
- ✧ Dragon Fruit Unit
- ✧ Lemon Grass Production Unit
- ✧ Live Stock Unit
- ✧ Horticulture Unit
- ✧ Dairy Unit

This research Centre is also producing

- ✧ Paddy rice of RNR 15043 variety, which is called DaiFit Rice with low GI index of 51.6, good for diabetic patients.

The Products from this research centre are Milk, Panneer, Khova, Curd, Bakery Cakes and Biscuits, paddy straw, mushrooms, Oyster mushrooms, vermicomost, liquid bio-fertilizer like Azotobacter, Rhizobium, Pseudomonas, Vegetable seed like Tomato, Brinjal, Mentha and Tulsi, Marigold flowers for extraction of oil with CO2 extraction, lemon grass etc

Fig.55 Livestock Unit

Centurion University has well-managed institutional dairy and poultry farm at Paralakhemundi campus, where students are being trained for different skills associated with farm management and production. The institutional dairy farm has 24 cows (HF and Jersey cross bred) and 17 buffalo (Murrah) and institutional poultry farm has 29 Kadaknath birds.

Fig.56 Mushroom Unit

Fig.57 Bio-Fertilizer Unit

Fig.58 Vermicompost Unit

Fig.59 Diary Unit

- **Centre for Aquaculture and Fish Processing Technology:-** The centre for Aquaculture and fish Processing Technology was established in the year 2020 with an aim to develop infrastructure and research in the field of Aquaculture and Fish Processing Technology. It focuses on enhancing the fish production through sustainable aquaculture technologies i.e,
    - Ornamental Aquaculture
    - Biofloc Aquaculture
    - Water Budgeting Study
    - Developing species specific feeds and health products for improved well-being of fishes
    - Aquaponics
    - Development of Value- added fish products
    - Sustainable valorization of fish by-products and processing wastes.

Fig.60 Fish Based High Value by Product Developed Diversified Value-Added Fish Product Developed Standardization of Culture of Earthworm as Fish Food

Fig.61 BIOFLOC Aquaculture and Crap Hatchery

Fig.62 Egg Collection Tank

Fig.63 Breeding and Hatching Pool

Fig.64 Fish Processing Technology

Fig.65 Intensive Aquaculture

- **Centre for Smart Engineering and Communication Technologies**

  - **Research and Development Focus**: The Centre for Communication Technologies (CCT), inaugurated on August 15, 2020, focuses on R&D of antennas for medical, military, daily applications, and 5G systems, aligning with Sustainable Development Goal 9 (Industry, Innovation, and Infrastructure).

- **Integration with Smart Engineering**: CCT has merged with the Centre of Smart Engineering Applications, established in 2020 to develop low-cost, indigenous technologies through innovative research and development efforts.

The Centre is involved in various research activities related to ECU for EV, IIoT for Garments manufacturing and Mining Industries, Shakti Processor (RISC-V) Design, and Insulin Pumps Prototype Development, which leads to Publications, Products, and Patents. The Centre uses various simulation tools like Matlab, Cadance, Xilinx, HFSS, Ansys, Keil µVision, Multisim, Eagle. The Centre for Smart Engineering Application also encourages Research Scholars for Post Graduate and Doctoral Degree in Signal Processing, Embedded System, VLSI Design, IIoT, and Electric Vehicles.

- **Insulin Pump Prototype**

An insulin pump delivers a pre-programmed amount of insulin to a diabetic patient in a continuous manner.

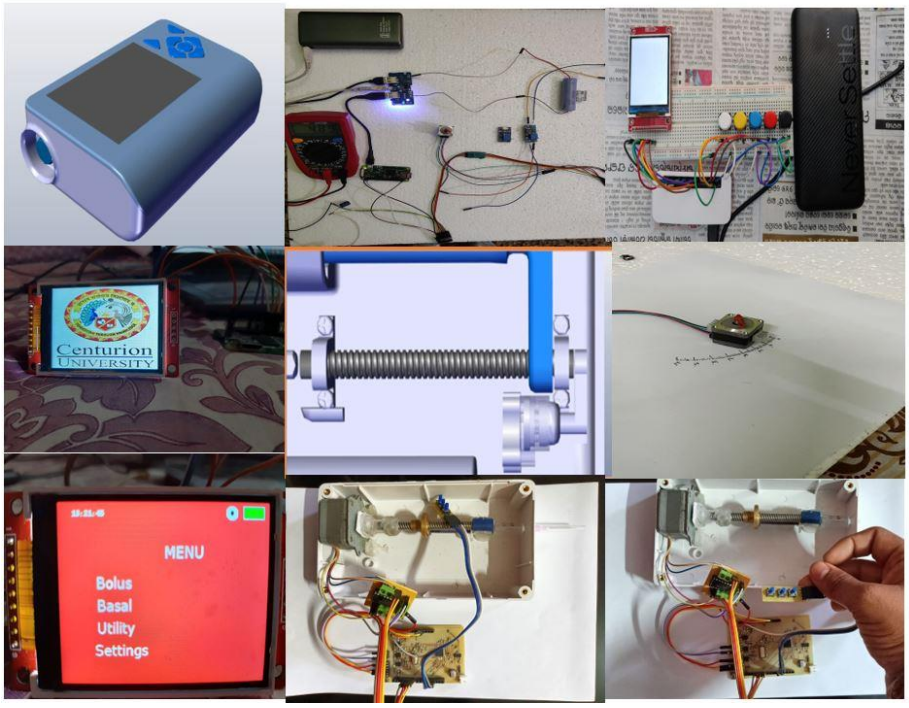


Fig.66 Insulin Pump Prototype

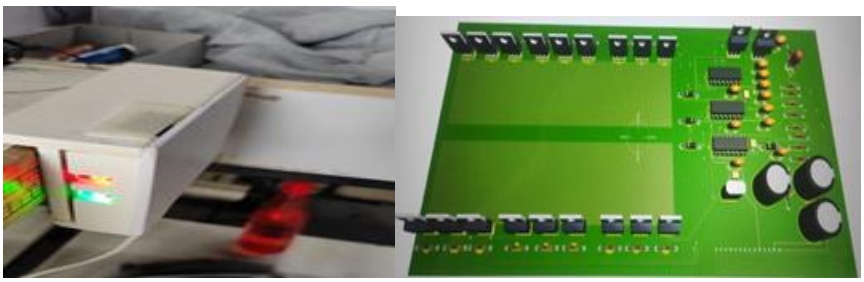


Fig.67 ECU for E-Rickshaw & IIOT Based Garment Production Line

Fig.68 Development of Mobile Robot

Fig.69 Electric Scooter

❖ **Centre for Computational Mathematics:-**

- Computational mathematics is a multidisciplinary field essential to science, engineering, and medical technology, where computing plays a key role.

- It bridges the gap between academia, R&D, and industry by focusing on computational techniques that reduce testing costs and product development time.

- Computational methods complement experimental and theoretical approaches, solving highly complex problems more efficiently.

- The Centre emphasizes three major areas: Computational Fluid Dynamics (CFD), High Performance Computing (HPC), and Quantum Computing (QC)..

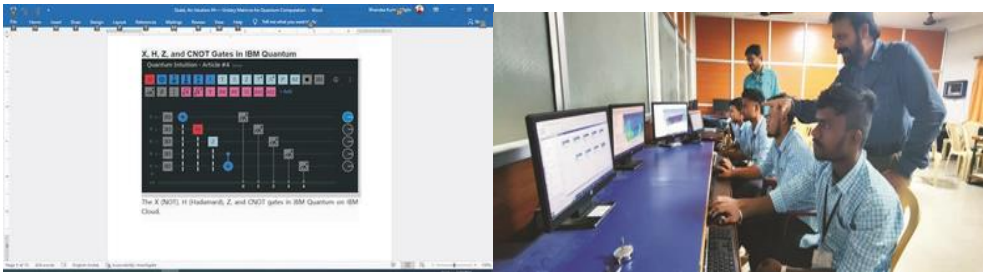


Fig.70 Quantum Computing

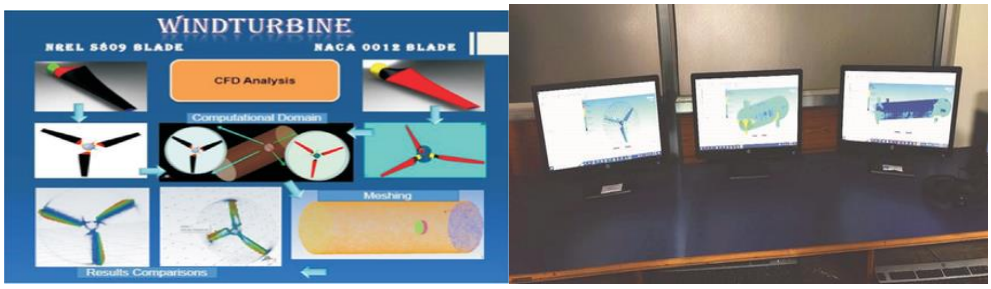


Fig.71 Computational Fluid Dynamics Analysis

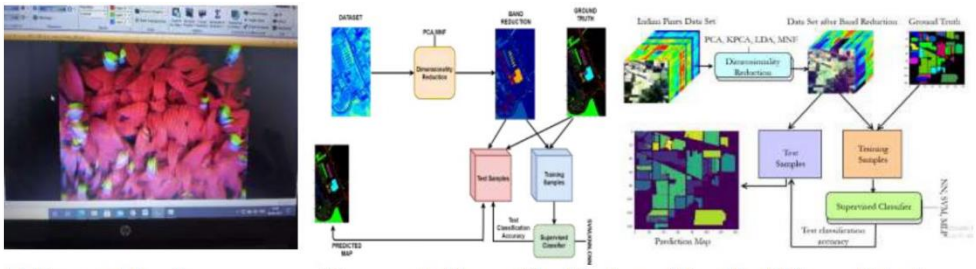
❖ **Centre for Data Science and Machine Learning:-**

- Machine learning enables computers to act without explicit programming, focusing on extracting knowledge and generating insights from data.

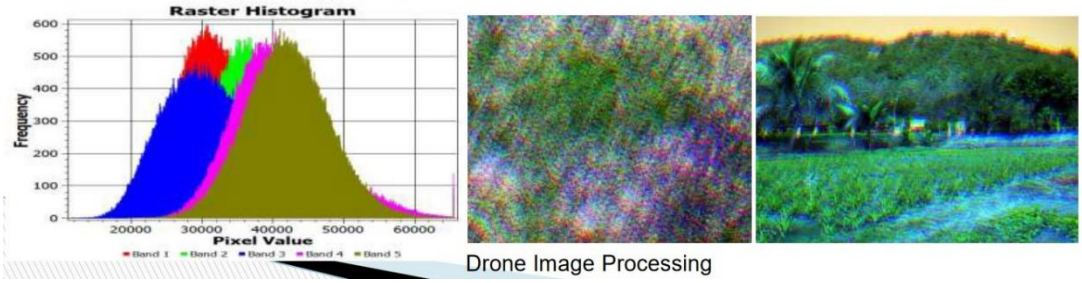
- The Centre for Data Science and Machine Learning develops systems and algorithms for pattern recognition, predictions, and data visualization across various applications.

- It conducts survey research and collects both structured and unstructured data, including text, multimedia, images, and video.

- The Centre performs data analysis, such as prediction, classification, and clustering, to solve real-life problems..

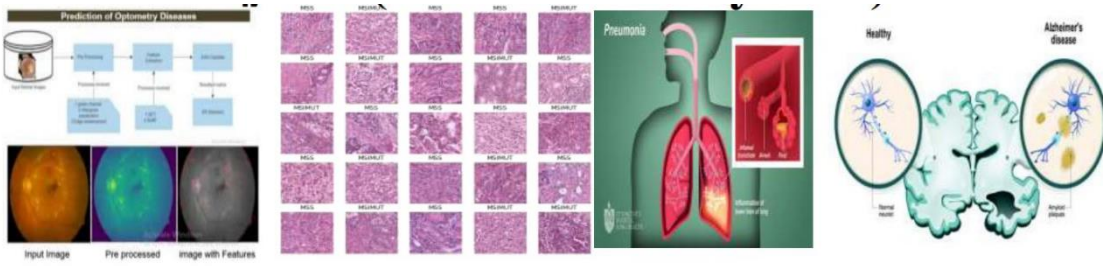


Multispectral Imaging Hyperspectral Image Classification Wheat Leaf Disease Detection



Drone Image Processing

Fig.72 ML, Multispectral and Hyperspectral Imaging



Eye Health Care System Gastrointestinal Cancer Detection Pneumonia Disease Detection Alzheimer Disease Detectio

- Breast Cancer Detection
- Brain Tumor Detection
- Bacteria Classification using Deep Learning
- Malaria Cell Detection
- Lung Cancer Detection
- Melanoma Detection
- Blood Cell Image Classification

Fig.73 MLProjects (Health Care System)

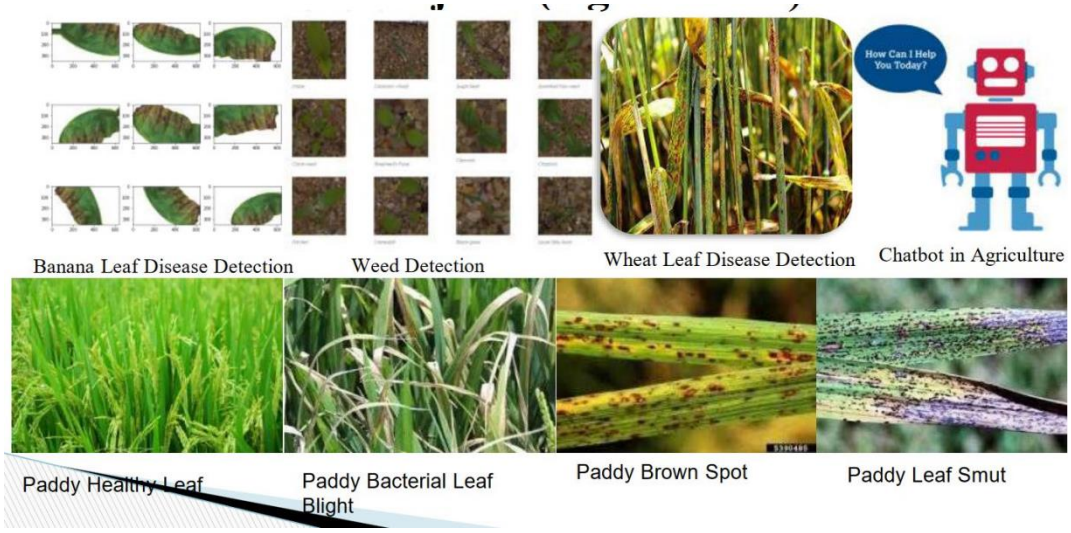


Fig.74 Machine Learning Projects in Agriculture

❖ **Centre for Design and Manufacturing**:-

- The Centre for Design and Manufacturing focuses on transforming concepts and lab models into market-ready products.
- It has in-house capabilities to manufacture power distribution transformers and CNC machined components for aerospace and automotive industries.
- The Centre also works on E-vehicle manufacturing, apparel making, wooden furniture, FRP products, 3D printing, welding, and fabrication.
- In the last two years, its clientele has included prestigious organizations like HAL, ISRO, BHEL, Indian Railways, and ALIMCO..

Fig.75 CNC Machining

Fig.76 Laminar Airflow

Fig.77 3D printing Lab

Fig.78 E-Vehicle Designs

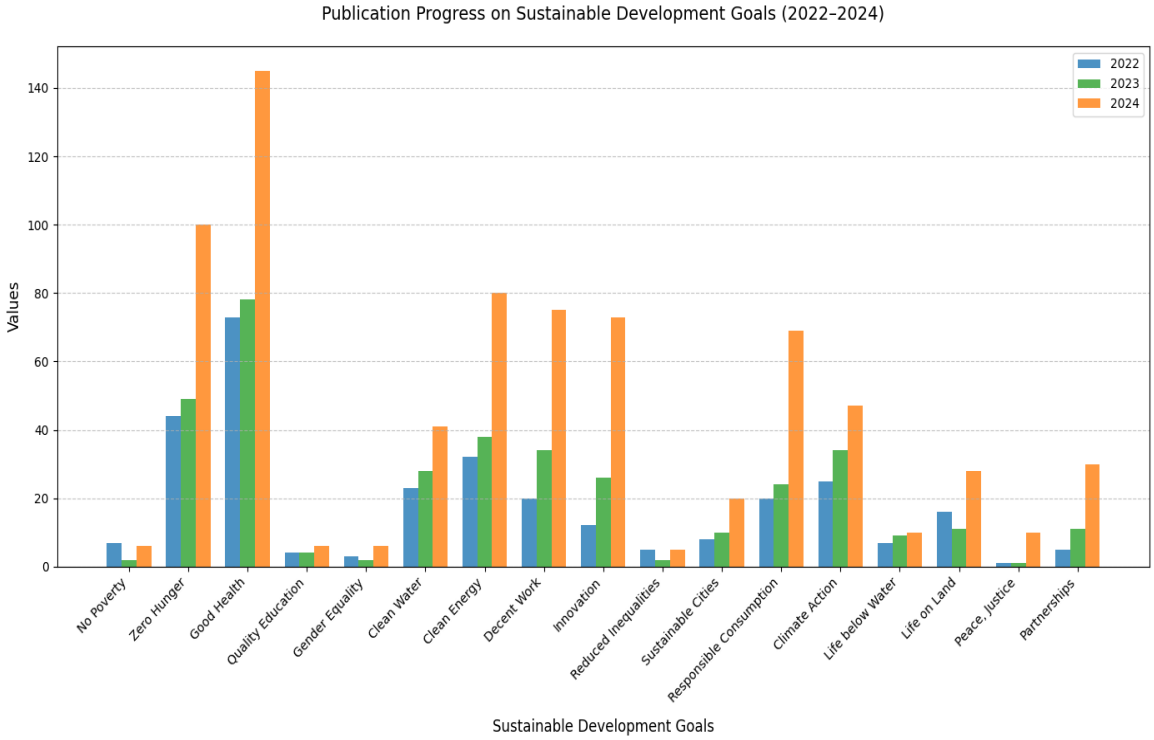


Fig.79 Graph of No. Of SDG Publications for the 2022-24

❖ **Centre for Drones** :-

- Established in March 2023, the Research Centre for Drones focuses on developing cost-effective drone technology for land planning, mapping, vegetation imaging, and infrastructure inspections.

- The Centre promotes innovation and research in four key areas: Manufacturing, Application, Service, and Training (MAST) related to drones.

- It collaborates with Gram Tarang Inclusive Development Services to achieve its MAST goals.

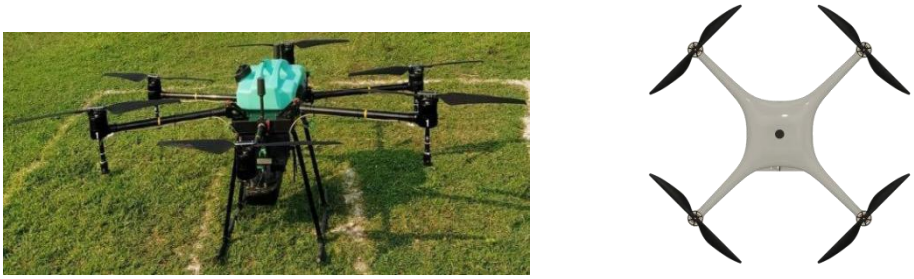


Fig.80 KRISHAK- Agri-Spray Drone & Survey & Image Processing Drone

❖ **Centre for Drug Design:-**

- The Centre for Drug Design (CDD) was established in 2020 to discover drugs and formulations for combating life-threatening infectious and non-infectious diseases.
- It consists of 60 faculty members from diverse fields such as Pharmacy, Zoology, Botany, and Forensic Science.
- The Centre engages in interdisciplinary research, using In-silico, in-vitro, and in-vivo approaches to synthesize New Chemical Entities (NCEs) from natural resources.
- CDD collaborates with academic and industrial partners both in India and abroad for drug discovery research..

Fig.81 Day Cream and Cleansing Gel

❖ **Centre for Fintech:-**

- Established in 2020, the Centre for Fintech focuses on developing low-cost, indigenous technologies through Research & Development.

- The Centre aims to create versatile learning environments by using technology and skills to connect, collaborate, and innovate.
- Key focus areas include AEPS, Fund Transfers, QR-based payments, Digi Pay, and Mutual Funds Distributors.

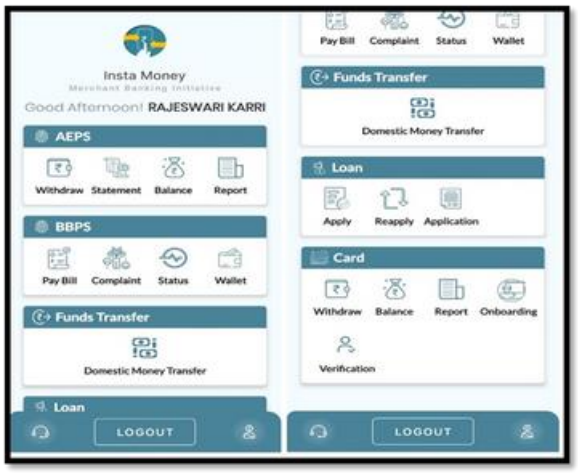


Fig.82 Instamoney Dashboard

❖ **Centre for Genetics and Genomics**:-

The Centre for Genetics and Genomics focuses on investigating gene functions to enhance crop and vegetable traits, aiming to develop climate-resilient plants resistant to biotic and abiotic stresses.

- **Hands-On Training**: The center provides hands-on training to students in molecular biology, plant tissue culture, and genetic engineering techniques, fostering skills in advanced breeding and biotechnology.
- **Research and Funding Projects**: The center is involved in funded projects by SERB and DST, focusing on disease resistance in vegetable crops and identifying candidate effectors from the Indian brown plant hopper through comparative transcriptomics and proteomics.

Fig.83 Students working on DNA Extraction

❖ **Centre for Governance and Sustainable Societies:-**

- The Centre for Governance and Sustainable Societies conducts research and promotes awareness of sustainable development goals (SDGs) through capacity-building initiatives, including conferences, webinars, and workshops.

- It engages in consultancy projects and academic research to design interventions aimed at fostering a sustainable society..

Fig.84 Workshops on Different Topics

❖ **Centre for Lasers:-**

- **Research and Prototyping:** The Centre for Lasers focuses on researching laser applications across various industries and developing prototypes, while also offering skill courses and summer internships to engage students in laser technology.

- **Collaborative Development:** The center collaborates with in-house research facilities and external institutions to enhance the understanding and application of laser technology through innovative research and development initiatives..

Fig.85 DIY Laser Lab

Fig.86 Students working with Laser Engraving Machine

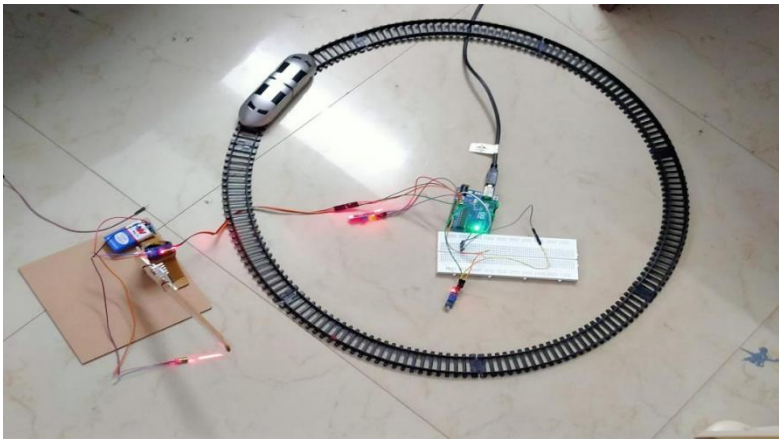


Fig.87 Smart Railway Gate Management (Laser Project)

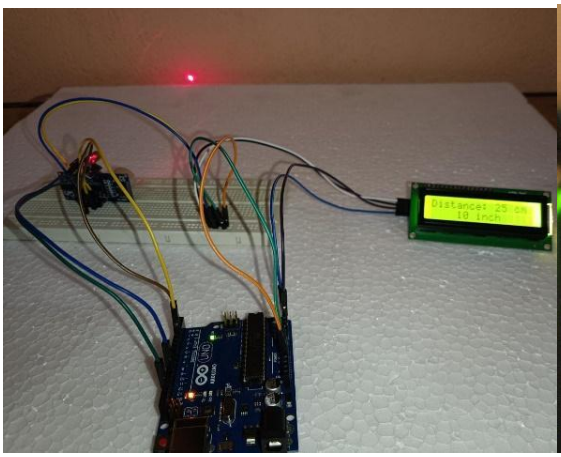


Fig.88 Laser Distance Measurer

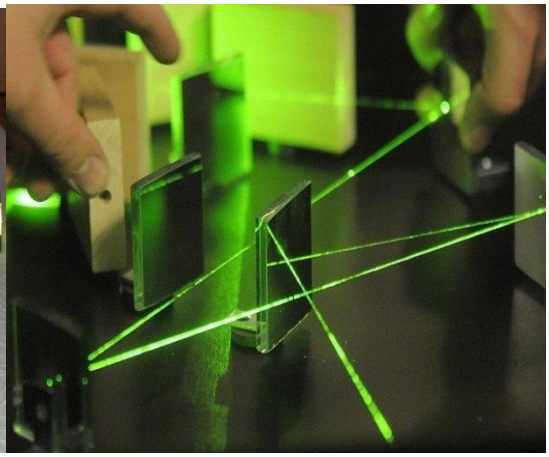


Fig.89 Laser Light Show

❖ **Centre for Medical Diagnostics:-**

- **Community-Based Health Care:** The Centre for Medical Diagnostics focuses on providing community health care and conducts outreach programs to improve local health outcomes through subsidized diagnostic services.

- **Comprehensive Diagnostic Services:** The Community Diagnostic Centre offers a variety of tests for monitoring health conditions and collaborates with health institutions to conduct health camps.

- **Cutting-Edge Training Facilities:** The Centre provides advanced laboratory facilities for student training in pathological investigations, radiology, optometry, emergency medicine, and physiotherapy.

- **Skill Development and Workforce Support:** It aims to enhance disease diagnosis, provide doorstep services, create industry-ready professionals, and address workforce gaps in the health sector through educational programs and training initiatives.

Fig.90 Community Outreach Activities

Fig.91 Collaborations with Centre for Medical Diagnostics

❖ **Centre for New Materials:-**

- **Material Research and Development:** The Centre for New Material focuses on R&D of advanced materials, including graphene, polymers, perovskites, nanomaterials, and alloys, targeting applications in water purification, agriculture, photovoltaic cells, and more.

- **Collaborative Applications:** The center develops nanomaterials like nanocurcumin, ZnO, and TiO2 for agricultural use, collaborating with the Centre for Smart Agriculture and the Centre for Phytopharma to enhance their impact..

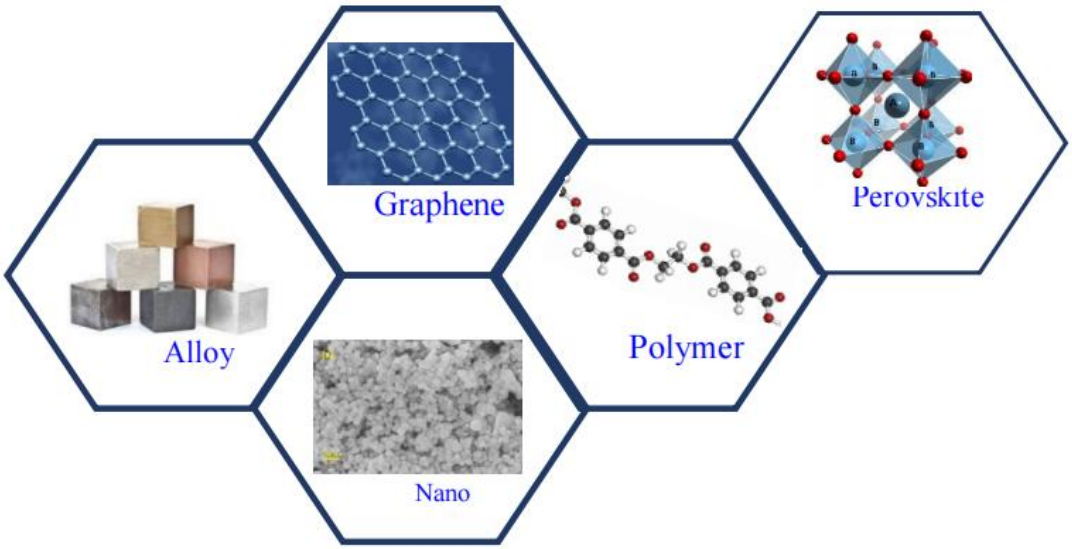


Fig.92 Nanomaterial Synthesis and Ag nanocomposite for water purification

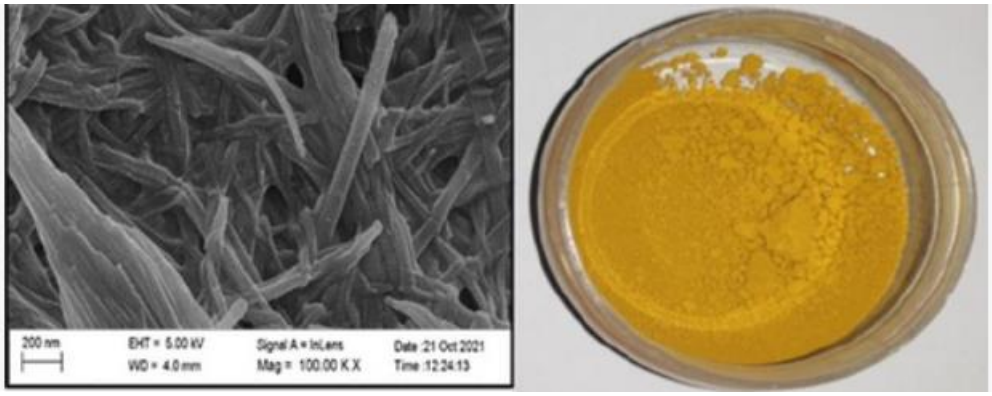


Fig.93 NanoCurCumin

❖ **Centre for Phytopharma**:-

- **Diverse Research Focus:** The Phytopharma Research Centre specializes in phytochemical analysis, essential oil extraction, and the implications of phytochemicals on human health, while also working on bioactive compound extraction, prebiotics, and probiotics.

- **Hands-On Learning and Projects:** The center offers domain-specific programs and skill courses for students to gain practical experience, and is involved in several funded research projects, supported by a diverse team of experts from chemistry, nutraceuticals, agriculture, and dairy technology.

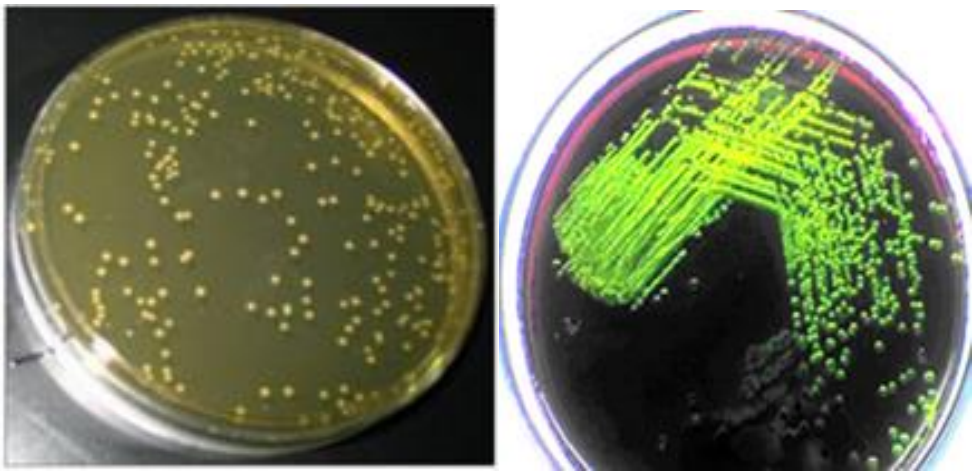


Fig.94 Growth of Lactobacillus species and Greenish mettalic sheen of E coli

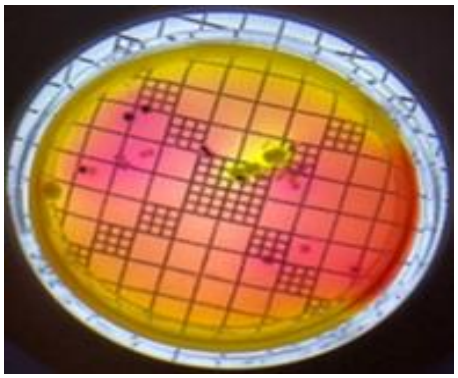


Fig.95 Staining photograph of E coli

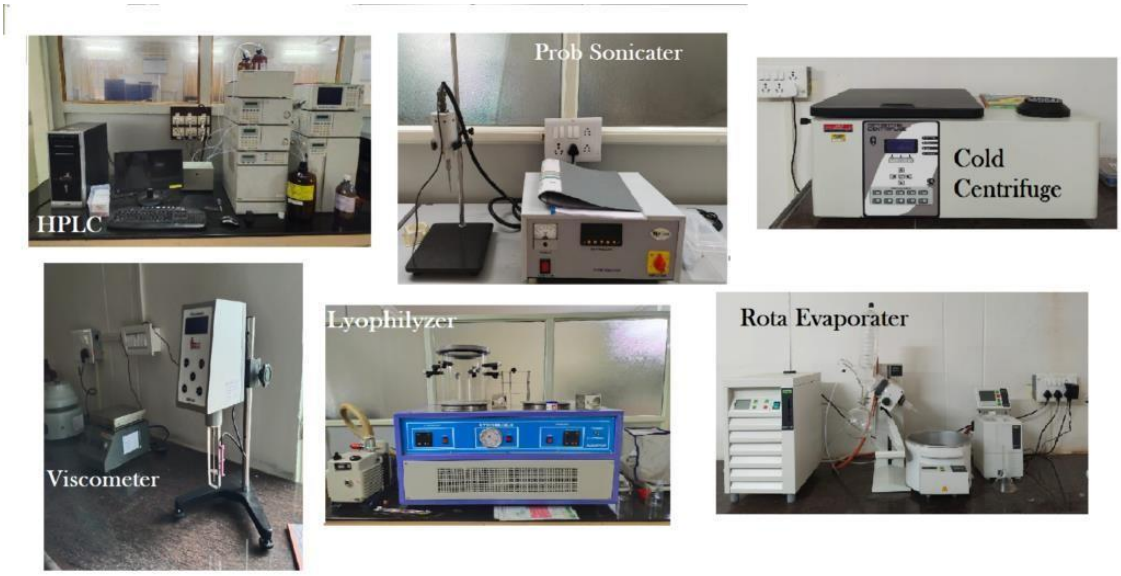


Fig.96 Machines for Phytopharma

Fig.97. Infrastructure and Facilities for Phytopharma

❖ **Centre for Plant Tissue Culture and Vegetative Propagation:-**

- The Centre focuses on micropropagation of banana, chrysanthemum, and ornamental plants, ensuring healthy, pathogen-free seedlings for agricultural use.

- It promotes academic research, training, and skill development to benefit tribal farmers, rural communities, and entrepreneurs, enhancing productivity in industrial sectors..

Fig.98 Different Plant Tissue Culture

❖ **Centre for Smart Infrastructure:-**

- Focus on Indigenous Technologies: Established in 2020, the Centre for Smart Infrastructure develops low-cost, indigenous technologies through R&D, emphasizing clean technology, smart grids, and IoT automation for sustainable rural livelihoods.

- Skill Development and Industry Collaboration: The center offers skill and certificate courses in areas like solar PV installation and polyhouse automation, and collaborates with industry partners such as Selco India and Schneider India to enhance its projects and training programs.

Fig.99 Automated Polycarbonate-based Polyhouse & Polyhouse at PKD Campus

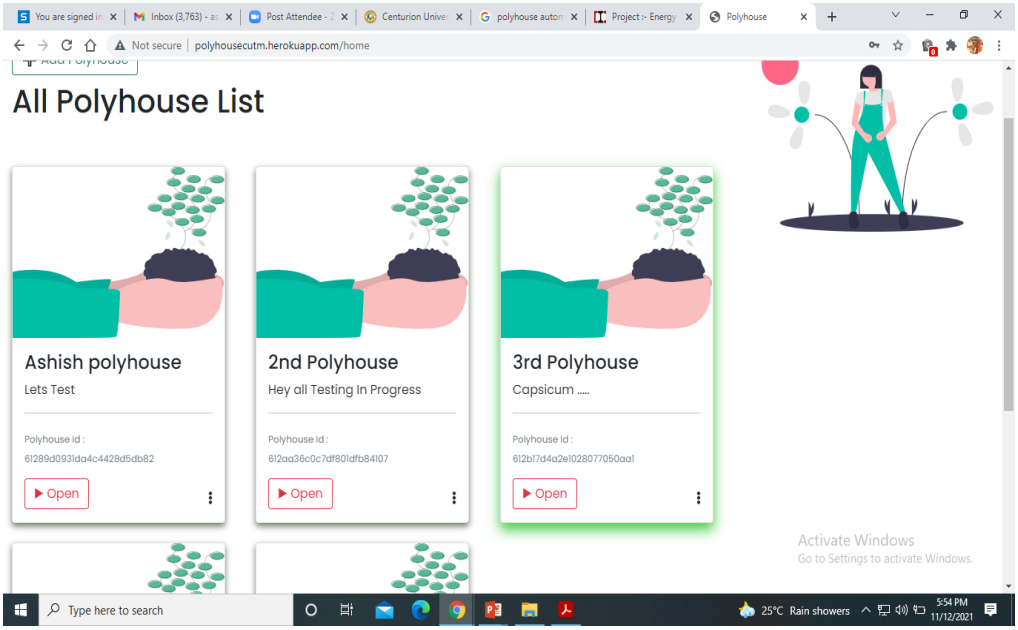


Fig.100 Web and Database Management

Fig.101 Solar Lighting at University

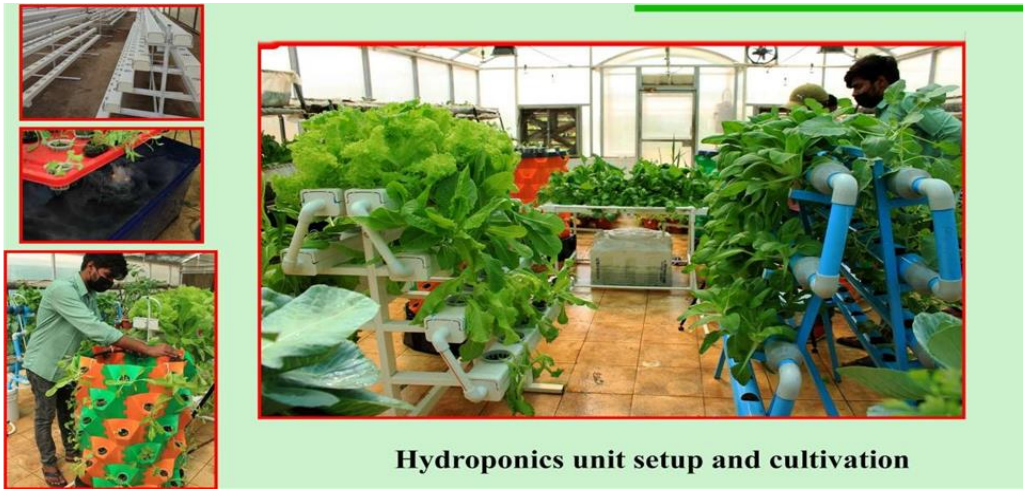


Fig.102 Hydroponics Unit

❖ **Centre for Smart Agriculture**:-

- **IoT-Based Automation and Soilless Culture:** The Centre for Smart Agriculture promotes IoT-based automation in greenhouses and educates individuals on soilless culture practices, aiming to enhance agricultural productivity and sustainability.

- **Precision Agriculture Research:** The center focuses on research and application of smart tools for precision agriculture, including the protected cultivation of gerbera and Dutch roses and the management of low GI rice using specialized apps like Paddy Predict and Kalgudi.

- **Innovative Crop Management Techniques:** The centre implements hydroponics and aeroponics for growing exotic crops, utilizes UAVs for crop health monitoring, and promotes efficient water management practices such as micro-irrigation and mulching to optimize yield.

Fig.103 Different types of Cultivations

6. Centurion University Innovation Ecosystem: From waste to resource, from seed to solution.

❖ SPeed Breeding/ Growth Chamber

Centurion University has established advanced Speed Breeding and Growth Chamber facilities to accelerate agricultural research and crop improvement. These state-of-the-art controlled environment chambers enable rapid plant growth by optimizing light, temperature, humidity, and nutrient conditions, allowing researchers to achieve multiple generations of crops within a single year. This innovation significantly reduces breeding cycles and enhances the development of climate-resilient, high-yield, and nutrient-rich crop varieties. By integrating modern biotechnology with sustainable farming practices, the University's Speed Breeding facility not only supports cutting-

edge research but also empowers farmers and students with practical solutions to address food security, climate change, and sustainable agriculture challenges.

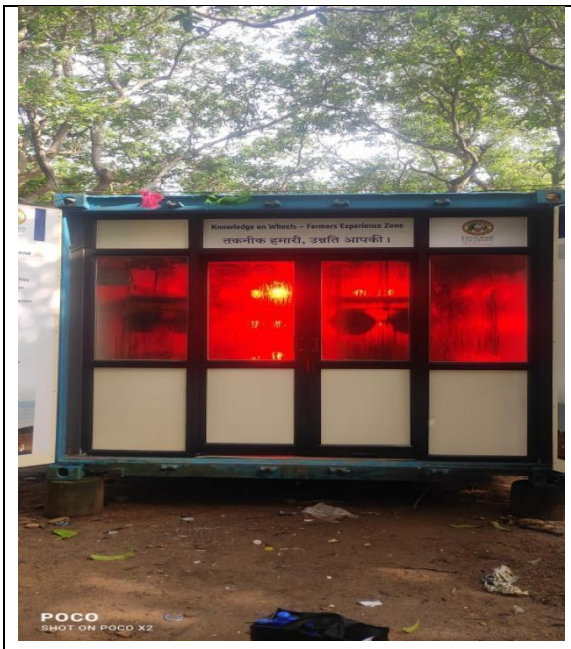


Fig 104.Speed breeding growth chamber outer view

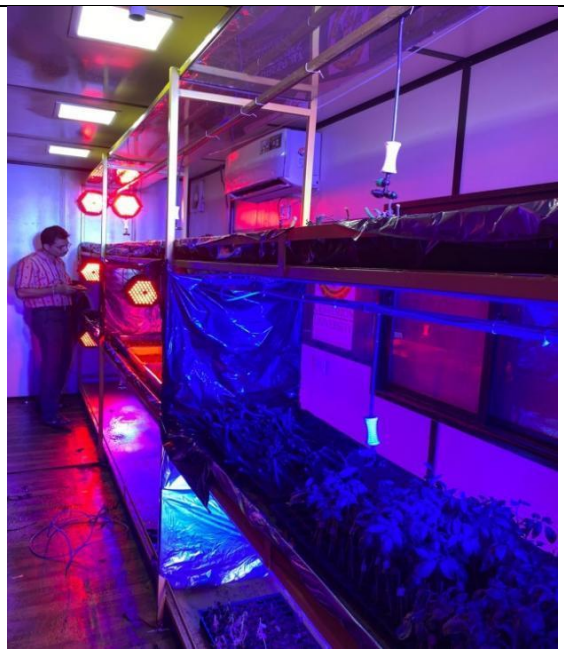


Fig 105.Speed breeding growth chamber Inner view

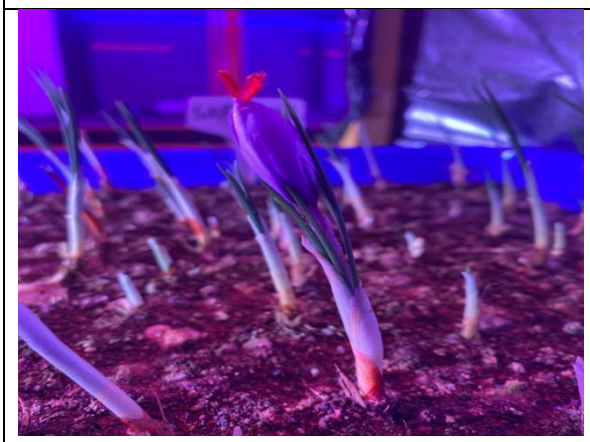
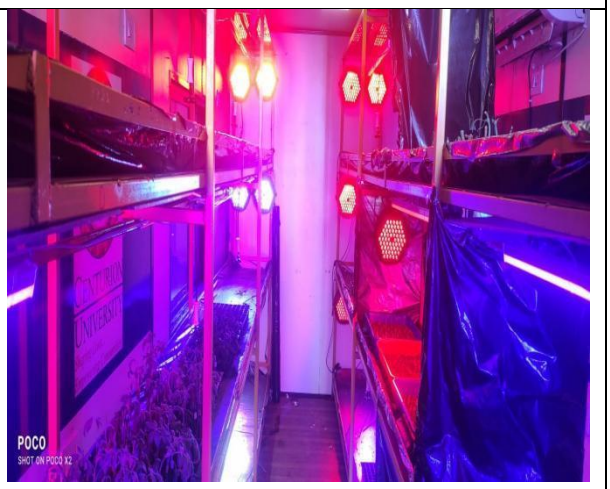


Fig106. saffron plants at Growth chamber



❖ **BIOENZYME UNIT**

"Turning waste into innovation, Centurion University powers sustainable solutions for a greener tomorrow."

Fig. 107 workshop on understanding Bioenzyme

Centurion University with collaboration with Bioenzyme Entreprenuers Academic,India has established a Bioenzyme Production Unit as part of its commitment to sustainability and waste-to-resource innovation. The unit focuses on producing eco-friendly cleaning and agricultural solutions by fermenting organic waste such as fruit and vegetable peels. These bioenzymes serve as natural alternatives to chemical-based products, supporting environmental conservation, soil health improvement, and cost-effective farming practices. The initiative not only reduces organic waste and promotes a circular economy but also provides hands-on learning opportunities for students, fostering awareness of sustainable living and green entrepreneurship.

Fig. 108 Preparation of Bioenzymes by our Students

Fig.109 Preparation of Bioenzyme by our "Green Brigade Staff"

- **BIOCHAR UNIT- "Biochar: Transforming waste into wealth for resilient agriculture."**

Centurion University has established a Biochar Production Unit to promote sustainable agriculture, waste management, and environmental conservation. The unit focuses on converting agricultural residues and organic waste into biochar through pyrolysis, a process that produces a stable form of carbon. Biochar enhances soil fertility, improves water retention, and reduces the need for chemical fertilizers, while also serving as a significant tool for carbon sequestration and climate change mitigation. By integrating research, innovation, and hands-on training, the Biochar Unit not only supports eco-friendly farming practices but also provides students and farmers with practical knowledge to adopt sustainable and cost-effective solutions, aligning with the principles of circular economy and green innovation.

Fig. 110 BIOCHAR Preparation and in house BioChar

7. AELP UNIT- Applied Entrepreneurship and Learning Program Unit--"Building skills, shaping industries, driving innovation."

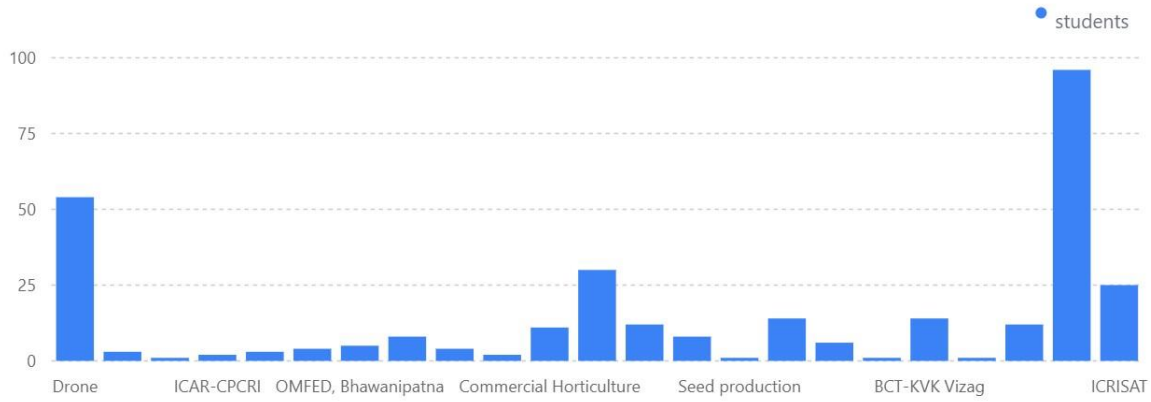


Fig. 111 Graph shows the students allotted for AELP unit in 2023-24

At Centurion University, Applied Entrepreneurship and Learning Program (AELP) Units serve as dynamic platforms where education, innovation, and enterprise converge. These units function as live laboratories—ranging from bioenzyme and biochar production to food processing, textiles, renewable energy, and advanced agri-tech—where students gain hands-on experience in running real-time enterprises. By integrating academic learning with entrepreneurial practice, AELP Units strengthen the University's innovation infrastructure, foster industry linkages, and nurture future-ready professionals. This unique model exemplifies SDG 9 by building resilient innovation ecosystems, promoting sustainable industries, and equipping students with the skills to drive inclusive and sustainable economic growth.

8. Conclusion

Centurion University stands as a living laboratory where ideas evolve into enterprises, skills spark innovation, and infrastructure drives transformation. By blending academics with industry-linked learning, the University has created an ecosystem that not only nurtures start-ups and patents but also delivers real-world solutions with social impact. From drones revolutionizing agriculture to waste-to-wealth innovations and resilient rural enterprises, Centurion University proves that sustainability and industrial growth can walk hand in hand. Its unique model ensures that every innovation is inclusive, every infrastructure resilient, and every initiative future-ready. In doing so,

Centurion University does not just contribute to SDG 9—it redefines how education can become the engine of sustainable industrialization and global progress.

“Centurion University : Where innovation meets impact, and infrastructure fuels sustainable futures.”

Centurion UNIVERSITY

Shaping Lives...

Empowering Communities...