Sustainable land use and conservation events

Centurion University has consistently demonstrated its commitment to environmental sustainability and the responsible management of natural resources. Recognizing that healthy land ecosystems are vital for food security, livelihoods, and climate resilience, the university undertakes multiple initiatives to promote the conservation and sustainable utilization of land, forests, and wild landscapes.

1. Sustainable Land Management and Restoration:

- The university has integrated sustainable land use principles into its campus planning and community outreach activities.
- Land within and around the campuses, particularly in Paralakhemundi, Rayagada, and Bolangir aspirational districts of India is maintained through eco-friendly landscaping, organic farming, and soil conservation practices.
- Through rainwater harvesting, hill plantations, and soil erosion control measures, Centurion University actively works to maintain soil fertility and reduce land degradation.
- The establishment of the Soil testing Laboratory in 2024 enables scientific analysis of soil parameters, supporting informed land-use planning and sustainable agricultural practices among farmers and students.

2. Forest Conservation and Green Cover Expansion

- Centurion University has implemented several tree plantation drives and afforestation programs as part of events such as World Environment Day and Van Mahotsav.
- These initiatives aim to increase green cover, restore degraded areas, and promote local biodiversity through the plantation of indigenous and climate-resilient species.
- The “One Plant, One Person” campaign launched in 2024 encourages every student to plant and nurture a tree during their academic journey, ensuring long-term commitment to forest and ecosystem restoration.
- Collaboration with the Forest Department and local panchayats enhances the impact of these efforts by combining scientific knowledge with community engagement.

3. Conservation Education and Awareness

- Centurion University integrates environmental education into its curriculum and outreach programs to foster awareness among students, faculty, and local communities.
- Through workshops, seminars, and field training, the university promotes understanding of ecosystem services, forest management, and biodiversity protection.
- Departments such as Agriculture, Horticulture focus on practical exposure to sustainable land-use systems and community-based conservation models.
- Awareness activities conducted by the NSS club encourage collective participation in campus and village-level conservation drives.

4. Sustainable Utilization of Natural Resources

- The university promotes sustainable agriculture, agroforestry, and integrated farming systems to balance productivity with ecosystem preservation.
- Students and faculty engage in the promotion of organic farming, vermicomposting, Azolla cultivation, and the use of Biofertilizers, Bioenzymes and Biopesticides, reducing chemical inputs and preserving soil and water health.

5. Protecting Wildlife and Natural Habitats

- Centurion University works closely with local authorities to protect wild lands and habitats near its campuses, especially those located in tribal and forest-rich regions of Paralakhemeundi, Rayagada and Balangir aspirational districts of Odisha.
- Students participate in field visits, biodiversity mapping, and eco-restoration activities, contributing to the conservation of local flora and fauna.

The university's conservation and land management initiatives directly support several UN Sustainable Development Goals (SDGs):SDG 13, and SDG12**.** These actions reflect Centurion University's holistic vision of **"Shaping Lives, Empowering Communities"** through sustainable and inclusive development.

❖ **Events at Centurion University:**

- **Educational Programmes, Workshops, and Training – Paralakhemundi Campus**

1. **Mini Kisan Mela (February 2–3, 2024):**

- Organized by final-year B.Sc. Agriculture students in Uppalada and Prahrajpalem villages.
- Aimed at knowledge exchange, community engagement, and promotion of sustainable agricultural techniques among rural farmers.

2. **3rd Utkal Krishi Mela (April 7–8, 2024):**
    - Attracted participation from over 2,000 farmers and stakeholders across Odisha.
    - Showcased agricultural innovations such as hydroponics, aquaponics, drone technology, and AR/VR applications.
    - Promoted scientific and sustainable farming practices aligned with SDG 2 (Zero Hunger) and SDG 12 (Responsible Consumption and Production).
3. **Soil Health Card Distribution:**
    - Farmers received Soil Health Cards providing information on pH, organic carbon, and nutrient levels (N, P, K).
    - Helped farmers make informed decisions on fertilizer use and crop planning.
    - Improved productivity, reduced input costs, and supported soil conservation.
4. **Agri Exhibitions (October 7 & 22, 2024):**
    - Conducted by RAWE students under the READY Programme at Chapara and Pedda Logidi villages in Andhra Pradesh.
    - Guided by faculty from the M.S. Swaminathan School of Agriculture.
    - Aimed to bridge academic learning with field practices and strengthen university–community linkages.

.

Fig 1: Glimpses of Kisan mela

- **Environmental Awareness and Plantation Initiatives – 2024**

1. **World Environment Day – June 5, 2024:**
    - Organized by Team CaSR in collaboration with the Department of Horticulture.
    - Conducted a plantation drive to promote environmental awareness and sustainability.
    - Encouraged students and staff to adopt eco-friendly practices and contribute to a greener campus and community.
2. **Van Mahotsav – July 1, 2024:**
    - Jointly organized by the Range Forest Office, Devgiri Range, and the NSS Unit, Centurion University–Paralakhemundi.
    - Involved 25 NSS volunteers planting indigenous tree species to enhance local biodiversity.
    - Strengthened commitment to natural resource conservation and climate change mitigation.
3. **World Nature Conservation Day – July 28, 2024:**
    - Plantation Drive conducted by the NSS Unit at the Aquaculture Research Farm, Totagumuda.

- 85 student volunteers planted saplings under the guidance of NSS Programme Officers.
- Aimed at restoring natural habitats, improving air quality, and promoting environmental stewardship.

4. **"One Plant, One Person" Initiative – August 21, 2024:**
    - Involved 1st-year B.Sc. Agriculture, B.F.Sc., and M.Sc. Agriculture students.
    - Each student planted a Kadam sapling to nurture throughout their academic journey.
    - Objective: Enhance campus green cover, improve air quality, and instill a sense of environmental responsibility.

Outcomes:

- Strengthened the university's role in environmental conservation and sustainability education.
- Fostered student engagement and a culture of eco-conscious citizenship.
- Supported SDG 13 (Climate Action) and SDG 15 (Life on Land) through continuous green initiatives.

Fig 2: Glimpses of Plantation drive

- On the occasion of Teacher's Day, the Agri flora Student's Society (CSAR) and NSS Unit of Centurion University organized a combined celebration and plantation drive on 5th September 2024 at Madhusudanpur Government High School, Gosani, Gajapati, Odisha.

To honour the invaluable contributions of teachers, drawing and debate competitions were conducted for school students, with prizes and certificates awarded to the winners.

- Our team also participated in the Teacher's Day celebration organized by the school and shared our experiences with the students. As part of the "One Person One Plant" campaign, a plantation drive was conducted within the school premises, promoting environmental awareness and encouraging an eco-friendly lifestyle among students.

Fig 3: Glimpses of NSS unit planting trees in nearby areas

- **Soil Conservation Initiatives by RAWE (Rural Agricultural Work Experience) Students – 2024**

1. **Field-Based Soil Conservation Activities:**
    - RAWE (Rural Agricultural Work Experience) students actively engaged in on-field initiatives promoting soil health and sustainable agriculture.
    - Supported local farmers in adopting eco-friendly and sustainable soil management practices.
2. **Soil Testing and Fertility Management:**
    - Conducted soil testing to assess nutrient composition and overall soil health.
    - Provided recommendations for organic inputs to improve fertility without degrading the ecosystem.
3. **Promotion of Sustainable Practices:**
    - Demonstrated vermicomposting, Azolla cultivation, and Trichoderma application to enhance soil structure and microbial activity.
    - Encouraged low-cost, biological soil enrichment methods to replace chemical fertilizers.

4. **Use of Organic Formulations:**

    - Trained farmers to prepare and apply Panchagavya and Jeevamrita, traditional organic formulations.
    - Promoted natural enrichment of soil and reduction of synthetic input dependency.

5. **Vegetation and Soil Stability Measures:**

    - Organized plantation drives and established kitchen gardens to increase vegetation cover.
    - Helped reduce soil erosion, enhance biodiversity, and ensure long-term soil stability.

Outcomes:

- Strengthened soil conservation awareness among farmers and students.
- Promoted eco-friendly farming techniques supporting SDG 2 (Zero Hunger), SDG 12 (Responsible Consumption and Production), and SDG 15 (Life on Land).

Fig 4: Photos of students demonstrating organic nutrients to local farmers.

- **Soil Health and Capacity-Building Initiatives – 2024**

1. **Establishment of Soil Health Monitoring Laboratory (2024):**

    - A Soil Health Monitoring Laboratory was developed to commercially analyze soil samples and issue Soil Health Cards.
    - Samples are received from farmers, NGOs, research scholars, and students across different regions.

- The laboratory analyzes **six key soil parameters**:
    - Soil pH
    - Soil Electrical Conductivity (EC)
    - Soil Organic Carbon (SOC)
    - Available Nitrogen (N)
    - Available Phosphorus (P)
    - Available Potassium (K)
- After analysis, **Soil Health Cards** are generated detailing all measured parameters for improved soil management and decision-making.

2. **AIA Training on Soil and Water Testing (June–July 2024):**
    - 10 students under the Agro Industrial Attachment (AIA) programme received hands-on training in soil and water testing and fertilizer recommendation.
    - Training included laboratory work, field visits to farmers' plots, NGOs, and the District Soil Testing Lab, Paralakhemundi.
    - Participants successfully completed the two-month programme and were awarded AIA completion certificates.
3. **Research Partnership with J-PAL South Asia:**
    - Centurion University collaborated with J-PAL South Asia for a research project titled "Regenerative Agriculture."
    - The project focuses on promoting sustainable and climate-resilient farming practices.
    - Farmers from Barchana Block, Jajpur District, Odisha were trained in soil sample collection and educated on the importance of Soil Health Cards for sustainable agriculture.
4. **Five-Day Residential Training for Vocational Trainers (20–24 June 2024):**
    - Conducted at Centurion University, Paralakhemundi, as one of the selected national venues.
    - 91 Vocational Trainers (VTs) participated in a five-day residential training programme.

Outcomes :

- Strengthened soil health management systems through research, training, and analysis.
- Enhanced student and farmer capacity in soil testing, nutrient management, and sustainable farming techniques.
- Supported SDG 2 (Zero Hunger), SDG 12 (Responsible Consumption and Production), and SDG 13 (Climate Action) by promoting regenerative and evidence-based agriculture.

Fig 5: Collection of Soil sample form villages

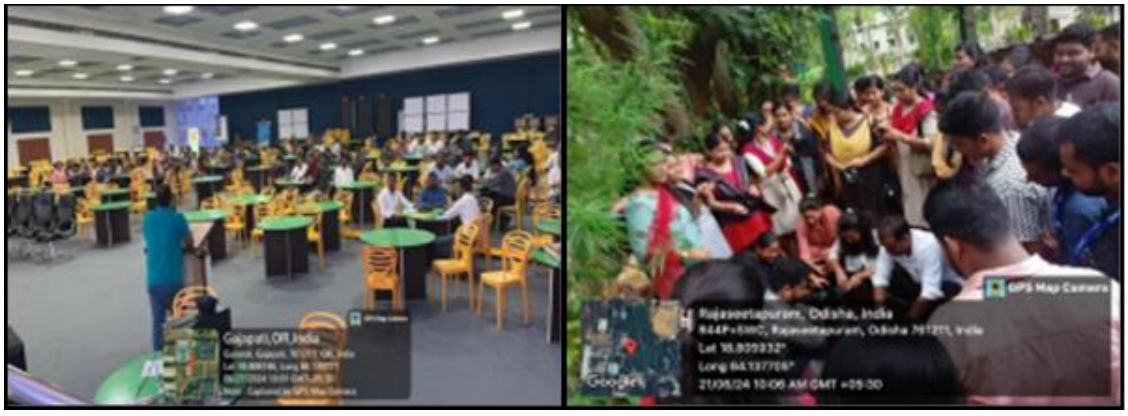

Fig 6: Glimpses from the training Programme

- **Management Development Program (MDP)**

A 3-day Management Development Program (MDP) from 26th June to 28th June 2024, for Secretaries of Primary Agricultural Cooperative Societies (PACS) under the Registrar of Cooperative Societies, Government of Odisha.

Program Objectives and Focus Areas

1. **Introduction to Health and Well-being:**

- Provided foundational understanding of physical, mental, and social well-being.
- Emphasized the role of healthy lifestyles in community and professional development.

2. **Financial Inclusion and Digital Literacy:**
   - Highlighted the importance of financial inclusion in empowering rural communities.
   - Discussed digital tools and technologies that enhance financial accessibility.
   - Explored key financial inclusion initiatives implemented in Odisha.
3. **Drone Technology in Modern Farming:**
   - Introduced participants to the application of drones in precision agriculture.
   - Showcased how drone technology can increase productivity and reduce labor efforts.

Apiculture Unit Activities

1. **Awareness and Skill Development:**
   - Conducted training sessions and live demonstrations on beekeeping.
   - Aimed at spreading practical knowledge among students, farmers, and visitors.
2. **Community Engagement:**
   - Set up a rural hut as an interactive learning space.
   - Enabled rural communities to gain firsthand experience in sustainable apiculture practices.

Outcome:

- Enhanced awareness about apiculture as a livelihood option.
- Strengthened links between modern agricultural practices and rural entrepreneurship.

- **Training on Nursery management:**

A One-day Training Programme on Commercial Horticultural Farm and Nursery Management" on 22nd August 2024 for the farmer trainees coming across Gajapati district in collaboration with SURAKSHA NGO. Around 35 farmers are trained under the above said training programme.

Fig 9: Training on Nursery management

- **Training on Dragon Fruit - Capacity Building Program**

1. **Organizer:**
    - AGARANA NGO, Rayagada district.
2. **Purpose of the Program:**
    - To provide training-cum-exposure for progressive farmers on modern and sustainable agricultural practices.
3. **Participants:**
    - **15 farmers** from Rayagada district participated in the program.
4. **Type of Program:**
    - Capacity-building programme aimed at enhancing farmers' technical and practical knowledge.
5. **Training Modules Covered:**
    - Mushroom and spawn production techniques.
    - Organic farming practices for sustainable cultivation.
    - Nursery development for quality planting materials.

- Post-harvest processing and value addition methods.

6. **Practical Exposure:**
    - Hands-on sessions conducted at Centurion University .
    - Exposure provided at various commercial agri-based units, including:
        - Spawn Production Unit
        - Mushroom Unit
        - Bakery Unit
        - Microbiology Laboratory

Outcome:

- Farmers gained practical skills and confidence to adopt innovative farming and processing techniques.
- Promoted knowledge sharing and the adoption of commercially viable and sustainable agri-enterprises in the Rayagada region.

Fig 10: Training on Dragon fruit

- **Domesticating of Dragon Fruit Cultivation at Hilltop, Centurion University Paralakhemundi**

1. **Location and Background:**
    - Situated on a hilltop area within the Centurion University campus, Paralakhemundi.
    - The site was originally barren, rocky, and unproductive, with poor soil fertility and limited water availability.
    - The land remained uncultivated for years due to its challenging topography and dryland conditions.

2. **Purpose and Vision:**
    - Developed in 2022 under Centurion University's commitment to sustainable agriculture, dryland horticulture, and experiential learning.
    - Aimed to transform unproductive land into a model site for sustainable horticultural innovation.
3. **Development Process:**
    - Scientific land development carried out through:
        - Land leveling and contour formation.
        - Soil enrichment using organic matter and compost.
        - Installation of drip irrigation systems for water efficiency.
        - Construction of cemented trellis poles to support dragon fruit vines (*Hylocereus spp.*).
4. **Planting and Cultivation Details:**
    - High-quality planting materials of both red- and white-fleshed dragon fruit varieties were sourced.
    - Implemented a systematic plantation layout ensuring proper spacing and canopy management.
    - Regular nutrient management, training, and pruning conducted as per scientific recommendations.
5. **Growth and Performance:**
    - Within two years, the plantation has shown excellent growth and vigor.
    - Plants have now reached the bearing stage, producing their first successful harvests.
    - Fruit yield and quality have been highly encouraging.

At present, the Dragon Fruit block serves multiple purposes:

- As a demonstration and training unit for students and farmers under experiential learning programmes.
- As a research and innovation platform for exploring sustainable practices, varietal performance, and postharvest management.
- As a model for community outreach, encouraging local farmers to adopt dragon fruit as a potential income-generating enterprise in dryland areas.

This transformation of a once-barren hilltop into a productive and vibrant horticultural landscape reflects the university's vision of integrating education, research, and sustainable development. The success of the Dragon Fruit field stands as a testimony to Centurion University's commitment to promoting livelihood-linked and climate-smart agricultural practices in the region.

Fig. 11 Land preparation in hill top for establishment of dragon fruit unit

Fig. 12 Unit at bearing stage

Impact and Significance:

- Demonstrates the feasibility of cultivating high-value, climate-resilient crops in marginal and upland hill areas.
- Serves as a model for sustainable land utilization and skill-based horticultural education.
- Provides hands-on learning opportunities for students and inspiration for local farmers to adopt innovative horticultural practices.

- **Terrace Orchard at Centurion University, Paralakhemundi**

The development of the Terrace Orchard represents a significant step toward optimum land utilization, ecological restoration, and livelihood enhancement through horticulture. It reflects

the university's continuous efforts to integrate education, research, and community engagement in promoting climate-resilient and resource-efficient farming systems.

1. **Establishment and Objective:**
    - Established in 2023 at Centurion University , Paralakhemundi.
    - Aimed at promoting sustainable and diversified fruit production systems in hilly and undulating terrains.
    - Focused on optimum land utilization and conservation of soil and water resources.

2. **Site and Land Development:**
    - Developed over a 5-acre terraced landscape, utilizing the site's natural topography.
    - Created step-like platforms (terraces) to conserve soil, reduce erosion, and enhance productivity.
    - Before development, the area was underutilized due to uneven slopes and poor accessibility.

3. **Soil and Water Conservation Measures:**
    - Adopted systematic planning and soil conservation techniques.
    - Constructed terraces with contour bunding, drainage systems, and irrigation channels.
    - Ensured efficient water use and prevention of soil erosion.

4. **Crop Diversity and Plantation Design:**
    - A wide range of fruit crops planted to ensure year-round productivity and diversity.
    - Major crops include:
        - Guava
        - Pomegranate
        - Banana
        - Citrus
        - Custard Apple

        - Dragon Fruit
    - Crop selection based on adaptability to local climate and income potential.
    - Integrated intercrops and green manure species to improve soil fertility and biodiversity.

5. **Scientific Management Practices:**
    - Drip irrigation installed for water efficiency.
    - Mulching applied to retain soil moisture and suppress weeds.
    - Integrated nutrient management (INM) for balanced plant nutrition.
    - Regular pruning, canopy management, and pest monitoring implemented.

6. **Performance and Early Results:**
    - Orchard shows excellent plant establishment and vigorous vegetative growth.
    - Early-bearing species (like banana and guava) have already begun producing fruits.
    - Indicates strong potential for long-term productivity and sustainability.

7. **Academic and Community Impact:**
    - Functions as a model demonstration site under the M.S. Swaminathan School of Agriculture.
    - Provides hands-on learning for students, researchers, and farmers.
    - Supports research, training, and skill development in:
        - Sustainable horticulture
        - Water-efficient farming
        - Land reclamation and soil conservation practices

8. Significance:
    - A model of integrated and eco-friendly fruit production in upland ecosystems.
    - Demonstrates how scientific land management can transform marginal terrains into productive assets.
    - Contributes directly to SDGs on sustainable agriculture, land conservation, and education.

Centurion University envisions becoming a regional hub for sustainability education and ecological research in eastern India. The university plans to expand its efforts through:

- Community-based forest management programs,
- Restoration of degraded landscapes,
- Biodiversity documentation projects, and
- Student-led sustainability campaigns that strengthen harmony between humans and nature.

Centurion University's initiatives in conserving and sustainably utilizing land and forest resources embody a practical, education-driven approach to environmental stewardship. By combining research, training, community engagement, and policy alignment, the university is cultivating a generation of environmentally responsible citizens committed to building a resilient and sustainable future.

Fig.13 Different activities in terraced orchard