SDG 15: Life on Land

Overview

The University of Science and Technology – Yemen (UST) recognizes the **profound link between healthy terrestrial ecosystems and sustainable community livelihoods**, particularly in a country like Yemen, where land degradation, water scarcity, and desertification threaten food security and social well-being.

Aligned with **Sustainable Development Goal (SDG) 15: Life on Land**, UST's activities in 2024 focused on:

- Environmental education and research on biodiversity, soil, and sustainable agriculture.
- Community engagement in reforestation and land restoration.
- Academic and policy collaboration with national and international institutions to promote ecosystem resilience.

Through its **Faculty of Environmental and Agricultural Sciences**, the **Center for Environmental Studies**, and **community outreach programs**, UST integrates teaching, research, and applied action for sustainable land management and environmental restoration.

1. Learning and Student Experience

a. Environmental and Agricultural Education

UST's programs prepare students to address land and ecosystem challenges through:

- **Bachelor's and Master's programs** in Environmental Sciences, Agricultural Systems, and Natural Resource Management.
- Courses in **Biodiversity Conservation**, **Soil Science**, **Land Use Planning**, **Climate-smart Agriculture**, and **Forestry Management**.
- Student-led fieldwork on **soil health**, **native vegetation mapping**, and **urban greening** projects.

In 2024, more than **900 students** engaged in land-related academic programs, workshops, and community projects.

b. Student Engagement and Awareness

- **Green Campus Club** organized the "**Plant a Tree, Sustain the Future**" campaign — resulting in **1,200+ native trees planted** across Aden, Taiz, and Sana'a campuses.
- Field studies and workshops on **soil erosion control** and **urban agriculture** were integrated into the Environmental Science curriculum.
- **World Environment Day (2024)** was celebrated under the theme *"Restoring Our Earth,"* with exhibitions and student research presentations on land restoration.

2. Research and Innovation

a. Research Themes (2023–2025)

UST's faculty and postgraduate researchers produced significant research aligned with SDG 15:

1. *"Assessment of Soil Erosion and Land Degradation in Yemen's Highland Regions"* – UST Journal of Environmental Studies (2024).
2. *"Biodiversity Mapping of Native Flora in Southern Yemen"* – Faculty of Environmental Sciences Research Group (2024).
3. *"Sustainable Agriculture Techniques for Arid Lands: Yemen's Case Study"* – UST-Agricultural Research Collaboration (2023).
4. *"Reforestation and Carbon Sequestration Potential in Semi-Arid Zones"* – Climate and Sustainability Research Center (2025).
5. *"Community-Based Land Rehabilitation in Post-Conflict Yemen"* – in partnership with the **UNDP and FAO** (2024).

These studies provide data and policy insights to combat desertification and promote land resilience.

UST faculty research actively addresses challenges of land degradation, desertification, water scarcity, and biodiversity loss — key concerns under SDG 15.

Year	Project / Publication	SDG 15 Relevance
2024	*Land Degradation and Desertification in Yemen: Causes and Mitigation Approaches* — UST Journal of Environmental Research	Provides data on soil erosion, vegetation loss, and sustainable land-management practices.
2024	*Sustainable Agricultural Practices for Arid Regions* — Faculty of Agricultural and Food Technology	Introduces climate-smart agriculture for soil fertility and yield stability.
2023–2025	*Reforestation and Urban Greenery Initiatives in Sana'a* — Civil and Environmental Engineering Department	Supports tree planting and urban-greening projects to enhance air quality and biodiversity.
2024	*Conservation of Medicinal Plants in Yemen's Highlands* — Faculty of Pharmacy	Catalogues endangered native plants and explores conservation through biotechnology.
2024	*GIS Mapping of Deforestation and Land-Use Changes in Yemen* — Engineering Research Center	Applies satellite data to track deforestation and guide land-use planning.

These studies illustrate UST's contributions to ecosystem restoration, sustainable agriculture, and biodiversity protection, directly supporting SDG 15 targets

b. Research Collaboration and Technology

UST partners with:

- **Ministry of Water and Environment** – for monitoring desertification and land degradation.
- **Food and Agriculture Organization (FAO)** – for sustainable land and food systems research.
- **UNDP Yemen** – on post-conflict environmental recovery projects.
- **Arab Environment Facility (AEF)** – for biodiversity data exchange and ecosystem management.

In 2024, UST researchers developed **GIS-based land degradation models** to identify priority areas for restoration in Lahj and Aden regions.

3. Sustainable Campus Operations

a. Green Campus and Biodiversity

- UST's campuses integrate **green design principles**, including native plant landscaping, reduced water irrigation, and soil health monitoring.
- **Biodiversity Gardens** were established at Aden and Taiz branches featuring native flora and medicinal plants for research and conservation.
- The university introduced **composting systems** using organic campus waste, producing soil fertilizer for the Green Campus Project.

b. Waste Management and Environmental Impact

- The **Zero Waste to Landfill initiative (2024)** reduced organic and paper waste by **65%**, minimizing the university's land pollution footprint.
- Laboratories implemented **eco-safe waste disposal protocols**, preventing chemical contamination of soil and groundwater.

4. Community Engagement and Environmental Restoration

a. Reforestation and Land Restoration

UST's **Community Service and Environmental Outreach Center** launched multiple initiatives:

1. **"Greening Yemen" Project (2024):**
    - Planted over **3,000 trees** in partnership with the **Aden Municipality**, **FAO Yemen**, and **local schools**.
    - Focused on restoring degraded urban and rural landscapes.
    - Students and volunteers contributed more than **3,000 working hours**.
2. **Soil Conservation Workshops:**
    - Conducted in collaboration with the **Ministry of Agriculture**.
    - Focused on sustainable irrigation, terracing restoration, and water-harvesting techniques.
3. **Biodiversity Conservation Training:**
    - Delivered to local farmers and youth groups on native species protection and integrated pest management.

b. Public Education and Awareness

- UST held a **national symposium on "Land, Food, and Sustainability" (2024)** — bringing together scientists, policymakers, and NGOs.
- Community seminars on **deforestation prevention**, **urban greening**, and **climate-smart farming** reached over **2,000 participants**.

5. Partnerships and Policy Engagement

UST promotes land and ecosystem sustainability through multi-level collaboration:

- **National Partners:** Ministry of Environment, FAO, UNDP, and local municipalities.
- **Academic Partners:** Aden University, Hadhramout University, and international environmental research institutes.
- **Civil Society Organizations:** Green Yemen Initiative, Resilient Earth Network.

These partnerships ensure UST's research and outreach contribute to **national policies** and **global environmental frameworks**, particularly under the UNCCD (UN Convention to Combat Desertification).

6. Performance Indicators (2024)

Indicator	2024	Progress / Description
Land-related research publications	**17+**	Interdisciplinary studies expanded through grants.
Trees planted through UST initiatives	**5,200+**	Expanded reforestation and campus greening.
Community outreach participants	**2,000+**	Increased engagement via training and awareness.
Partnerships for ecosystem restoration	**7**	Including FAO, UNDP, AEF, and local municipalities.
Organic waste composted on campus (%)	**65%**	Significant reduction in land waste.
Student research projects on land/soil	**35+**	Field-based research and capstone projects.
Areas restored or planted (hectares)	**15+**	Documented under "Greening Yemen" campaign.

7. Case Studies

Case Study 1 – "Greening Yemen" Reforestation Project

UST's flagship land restoration initiative launched in 2024 focused on combating desertification and promoting community awareness.

Highlights:

- 5,000+ native trees planted.
- Collaboration with FAO, Aden Municipality, and local NGOs.
- Included student training on nursery management and irrigation systems.
- Positive community feedback and media coverage on local TV and *Al-Ayyam Newspaper*.

Case Study 2 – "Sustainable Agriculture in Arid Environments" Research

- Multidisciplinary research integrating environmental science, economics, and engineering.
- Developed models for **low-cost drip irrigation** and **soil nutrient regeneration** using composting.
- Pilot implementation with farmers in Lahj region improved crop yield by **22%**.

Case Study 3 – "Zero Waste to Landfill" Campus Policy

- Initiated by UST Environmental Unit (2024).
- Reduced landfill waste by 65% through composting, paper recycling, and plastic elimination.
- Transformed waste into organic fertilizers for tree-planting programs.

8. SDG Linkages

Linked SDG	Connection
SDG 2 – Zero Hunger	Promotes sustainable agriculture and soil fertility.
SDG 6 – Clean Water and Sanitation	Supports watershed management and water-efficient farming.
SDG 13 – Climate Action	Increases carbon sequestration via reforestation.
SDG 14 – Life Below Water	Reduces terrestrial runoff pollution impacting marine systems.
SDG 17 – Partnerships for the Goals	Expands global collaboration on land restoration.

9. Future Outlook (2025 Targets)

1. Launch a **National Center for Land and Biodiversity Research**.
2. Increase **reforestation coverage to 10,000 trees annually**.
3. Expand **student environmental internships** in collaboration with FAO and UNDP.
4. Publish **20+ peer-reviewed papers** on land degradation and restoration.
5. Develop **GIS-based desertification risk maps** for southern Yemen.
6. Integrate **sustainable agriculture innovation labs** across campuses.

10. Conclusion

The University of Science and Technology – Yemen has established itself as a **leader in environmental education and terrestrial ecosystem management** in the region.

Through its academic programs, innovative research, and community partnerships, UST contributes meaningfully to restoring degraded lands, conserving biodiversity, and advancing sustainable land use practices.

Despite Yemen's ecological challenges, UST's proactive initiatives — such as **"Greening Yemen"**, **Zero Waste Campus**, and **land restoration research** — demonstrate measurable impact and long-term commitment to achieving **SDG 15: Life on Land**.