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جامعة تبوك
University of Tabuk

SDG 13: Climate Action

13 CLIMATE ACTION

U_Tabuk

Climate change is one of the most pressing global challenges today, requiring comprehensive strategies and proactive measures to mitigate its impacts. Countries worldwide are developing plans and policies to confront and manage the consequences of climate change. In Saudi Arabia, Vision 2030 reflects a national commitment to reducing carbon emissions, implementing sustainable plans, and promoting the adoption of renewable energy solutions.

The University of Tabuk has actively contributed to these national efforts through its Renewable Energy and Environmental Technology Center, advancing research, innovation, and practical solutions in the field of climate action. A prominent initiative is the launch of the National Alliance Project (#NetZero_Innovation_Center) in partnership with NEOM, Red Sea Global, and Teesside University. This project aims to develop sustainable environmental solutions by adopting advanced technologies and facilitating the transition of industries toward achieving net-zero carbon emissions by 2060.

Through these initiatives, the University of Tabuk demonstrates leadership in climate action by integrating research, innovation, and collaboration with industry and international partners to support Saudi Arabia's ambitious climate goals and global sustainability commitments.

13.1 Research on climate action

The University of Tabuk is making significant contributions to global climate action through pioneering research focused on renewable energy, carbon reduction, and sustainable technologies. These research initiatives directly support the objectives of SDG 13 by developing innovative solutions to pressing climate challenges. Notable examples include:

Nefzi, A. (2024). Climate change dynamics in Tunisian agriculture: A rigorous examination of impact, adaptation, and resilience. *Journal of Infrastructure, Policy and Development,* *8*(13), 9136. https://doi.org/10.24294/jipd9136

Alhejaili, M. O. (2024). Integrating climate change risks and sustainability goals into Saudi Arabia's financial regulation: Pathways to green finance. *Sustainability (Switzerland),* *16*(10), 4159. https://doi.org/10.3390/su16104159

Lakhouit, A. (2024). Mitigating landfill emissions strategies for effective waste management in Tabuk. *Cleaner Waste Systems,* *9*(1), 100187. https://doi.org/10.1016/j.clwas.2024.100187

13.3 Environmental education measures

13.3.1 Local education programmes on climate

The University of Tabuk actively implements local education programmes and campaigns to raise awareness about climate change risks, impacts, mitigation, adaptation, impact reduction, and early warning. These initiatives target students, faculty, and the broader community, emphasizing sustainability, environmental responsibility, and practical engagement.

Environmental Pioneers Challenge (#تحدي_رواد_البيئة)

The Deanship of Student Affairs launched the *Environmental Pioneers Challenge*, designed to support innovators and creative minds in developing environmental solutions. The challenge encourages novel and practical approaches to sustainable environmental awareness.

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Mathematics and Its Applications in Environmental Sciences

As part of the Faculty of Science's community responsibility initiatives, the Mathematics Department organized an event titled *"Mathematics and Its Applications in Environmental Sciences"* under the theme *"Towards a Sustainable Environment."* The event highlighted sustainable development goals, including good health and well-being, affordable and clean energy, industry, innovation and infrastructure, and climate action.

https://x.com/event_ut/status/1863567934712357227?s=48

"The Environment is Our Future and Our Children's Future" Exhibition

The College of Science, through its Community Responsibility Unit in the Biology Department, organized the exhibition *"The Environment is Our Future and Our Children's Future"*. The exhibition aimed to promote recycling culture, utilization of waste materials, and reinforcement of environmental sustainability awareness among students and the community.

https://x.com/event_ut/status/1854511183446852020?s=48

"My Environment, My Responsibility" Campaign

The University College in **Tayma**, female campus, represented by the Computer Science Department, launched the campaign *"My Environment, My Responsibility."* The initiative aimed to raise community awareness about environmental issues and instill a sense of individual and collective responsibility to preserve Saudi Arabia's environmental resources, promoting sustainable behaviors across all segments of society.

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Sustainable Fashion Workshop (#الاعتزاز_بتراثنا)

As part of the *Pride in Our Heritage* project, the Faculty of Design and Arts, in collaboration with the Archaeological Studies Unit, conducted a workshop titled *"Sustainable Fashion and Its Impact on the Environment and Society."* The workshop explored the concept of sustainability, traditional fashion across all regions of Saudi Arabia, heritage materials, recycling practices, and waste reduction strategies.

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"Live and Let Others Live" Initiative

Coinciding with **Environment Week**, the University College in Tayma, female campus, represented by the Biology Department, organized the initiative *"Live and Let Others Live"*. This programme focused on promoting sustainable development and environmental conservation, with particular emphasis on biodiversity preservation in line with Saudi Vision 2030.

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Environment Week Activities – Umluj Campus

During **Environment Week**, the University College in Umluj, represented by the Biology Department, conducted multiple events, including plant identification and classification activities, awareness of local fishery resources, and the opening of a recycling exhibition, fostering environmental knowledge and sustainable practices among students and the community.

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13.3.2 Climate Action Plan, shared

The University of Tabuk has established a comprehensive **Climate Action Plan** to address climate change and promote sustainability. The plan focuses on reducing carbon emissions, advancing renewable energy, and enhancing environmental stewardship, while actively engaging local government, community groups, and stakeholders.

Climate Action Plan

NetZero Innovation Centre

As part of this initiative, the University launched the **NetZero Innovation Centre**, a national research and innovation hub. The Centre develops sustainable environmental solutions through advanced technologies and supports industries in achieving **net-zero carbon emissions by 2060**, contributing to **Saudi Vision 2030**.

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Key Objectives:

- Develop carbon removal technologies.

- Reduce reliance on conventional energy sources.
- Explore clean energy alternatives such as hydrogen and wind.
- Minimize waste through circular economy models.

- Create innovative circular carbon economy systems to lower the carbon footprint.
- Build on ongoing research projects in collaboration with NEOM and Red Sea Global.

Advancing Climate Action through Research and Innovation: Strategic Collaborations at the University of Tabuk

In a demonstration of leadership and commitment to advancing research and innovation for climate action, His Excellency Prof. Abdullah Al-Dhyabi, President of the University of Tabuk, met with Dr. Mohammed Al-Otaibi, Supervisor General of the Authority for Research, Development, and Innovation, and Prof. Abdulaziz Al-Malik, Deputy Minister of the Ministry of Environment, Water, and Agriculture for Research and Innovation. The meeting focused on exploring avenues for collaboration in research, development, and innovation, particularly in areas related to environmental sustainability, renewable energy, and climate solutions.

Afforestation Initiatives – University of Tabuk

The University of Tabuk actively promotes environmental sustainability through its **tree-planting and afforestation initiatives**, contributing directly to carbon emission reduction and the achievement of Saudi Arabia's Green Goals.

"1000 Trees" Initiative

The University launched the *"1000 Trees"* initiative to engage students, faculty, and community members in tree-planting activities aimed at mitigating carbon emissions and promoting environmental awareness. Participants are encouraged to

plant local tree species to support sustainable green spaces.

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Tayma Campus Participation

The Applied College branch in Tayma partnered with the National Center for Vegetation Development and Combating Desertification (General Directorate of Pastures) to plant native trees in the Centennial Park of Tayma during the 2024 Tree-Planting Season, under the theme *"We Plant for Our Future"*, in collaboration with the Tayma Municipality.

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This plan underscores the University's leadership in climate action, integrating research, innovation, and community engagement to support regional and national sustainability goals.

Permanent University Tree-Planting Committee

The University maintains a dedicated committee responsible for overseeing campus-wide afforestation efforts, including strategic planning, implementation, and monitoring. Key responsibilities include:

- Developing a strategic plan for tree planting across the main campus and colleges in all governorates.
- Coordinating and enhancing the maintenance of planted areas, including irrigation, fertilization, pruning, and trimming.
- Preparing phased implementation plans for campus tree planting.
- Evaluating the execution of the strategic planting plan.
- Supervising the university nursery, selecting appropriate winter, summer, and seasonal flowers, and cultivating seedlings for multiplication.
- Reviewing periodic tree-planting reports from relevant campus departments.
- Approving landscape designs and maintenance methods for planted areas.
- Identifying environmentally suitable plant species for campus and college locations.
- Establishing policies for plant protection against pests.
- Conducting continuous evaluations to enhance positive outcomes and address challenges.

This initiative forms part of the University of Tabuk's Third Strategic Plan (2023–2025), reinforcing the institution's commitment to sustainable environmental practices and green campus development.

The Standing Committee for Afforestation at the University of Tabuk

The Third Strategic Plan of the University of Tabuk (See page 34-35)

Overall, the plan underscores the University's leadership in climate action by integrating research, innovation, and community engagement to advance regional and national sustainability goals."

13.3.3 Co-operative planning for climate change

The University of Tabuk actively participates in cooperative planning to address climate change-related disasters, including risks that may lead to environmental degradation, loss of biodiversity, and impacts on local communities. These efforts are aligned with national and regional sustainability priorities and involve strategic collaboration with government agencies, research institutions, and local stakeholders to ensure a holistic approach to climate resilience.

Climate Action Plan

Seed Bank and Plant Conservation Strategies in Tabuk

As part of its biodiversity and climate resilience initiatives, the University has launched a Seed Bank Project aimed at preserving selected native plant species in the Tabuk region. This project, conducted in partnership with the Saudi Environmental Fund, coincides with Environment Week 2025 and represents a significant step in adaptive strategies for climate-related ecological challenges.

A University research team carried out a field study in Wadi Mushai, located in southeastern Tabuk, to investigate the descriptive and quantitative characteristics of local vegetation and collect seeds from native plant species adapted to arid valley environments.

Key Outcomes of the Field Study:

- Comprehensive classification of plant species and estimation of vegetation coverage and density.
- Detailed morphological characterization of flowering plants and documentation of variations in seed production seasons for species of economic and ecological importance.
- Collection of seeds from medicinal and rare plant species, enhancing the value of the project and contributing to the long-term conservation of threatened flora.

This initiative lays the groundwork for the establishment of a regional seed bank, ensuring the preservation of rare and endangered species and supporting biodiversity as a critical component of climate adaptation strategies.

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Integration with University Climate Action Initiatives

The Seed Bank Project complements the University's broader climate action and sustainability initiatives:

Climate Action Plan:

Developed to address climate change and promote sustainability through carbon reduction, renewable energy adoption, and stakeholder engagement.

Includes the **NetZero Innovation Centre**, which facilitates industry transitions to **net-zero emissions by 2060**. Key objectives include developing carbon removal technologies, exploring renewable energy alternatives, implementing circular economy models, and leveraging ongoing research collaborations with NEOM and Red Sea Global.

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Afforestation and Green Initiatives:

"1000 Trees" initiative engages students, faculty, and the community in planting native trees to reduce carbon emissions.

Strategic planning by the Permanent Tree-Planting Committee ensures long-term care, site selection, species suitability, pest protection, and monitoring of planted areas.

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The Standing Committee for Afforestation at the University of Tabuk

The Third Strategic Plan of the University of Tabuk (See page 34-35)

Local Education Programmes on Climate:

Programmes and campaigns, such as the Environmental Pioneers Challenge, Sustainable Fashion Workshops, and "Live and Let Others Live" initiatives, educate students and the community on climate risks, sustainability, and biodiversity conservation.

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Leadership Engagement:

High-level collaboration is exemplified by meetings between Prof. Abdullah Al-Dhyabi, University President, Dr. Mohammed Al-Otaibi, Supervisor General of the Authority for Research, Development, and Innovation, and Prof. Abdulaziz Al-Malik, Deputy Minister of the Ministry of Environment, Water, and Agriculture.

These discussions focus on strengthening research, development, and innovation partnerships in environmental sustainability, renewable energy, and climate solutions.

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Through its cooperative planning initiatives, including the Seed Bank Project, Climate Action Plan, afforestation efforts, research, and community engagement, the University of Tabuk demonstrates comprehensive leadership in climate action. These integrated initiatives not only address regional climate risks and biodiversity conservation but also align with Saudi Vision 2030, advancing national sustainability objectives and ensuring resilience against climate-related disasters.

13.3.4 Inform and support government

The University of Tabuk plays an active role in informing and supporting local and regional government authorities in managing climate change risks, early warning systems, and disaster preparedness. Through a combination of research, strategic initiatives, community engagement, and high-level collaboration, the University provides evidence-based insights and practical solutions to support decision-making in climate resilience.

Climate Action Plan

Research-Based Support and Monitoring

The University's research activities directly inform climate risk assessment and mitigation strategies:

Seed Bank Project and Plant Conservation in Tabuk:
A research team conducted a field study in Wadi Mushai, southeast Tabuk, to classify native plant species, analyze vegetation coverage and density, and collect seeds from rare and medicinal plants. This data supports local biodiversity management and informs government strategies for conserving threatened species in arid environments.

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Climate and Sustainability Research:

Research outputs in climate resilience, renewable energy, and environmental sustainability provide evidence for policy development and regional planning

These studies generate actionable insights that local authorities can use for early warning systems, climate adaptation planning, and monitoring of environmental risks.

Strategic Initiatives for Government Collaboration

1. **Climate Action Plan:** The University has developed a comprehensive Climate Action Plan shared with local authorities and community stakeholders. It outlines strategies for reducing carbon emissions, implementing renewable energy, and fostering environmental sustainability. The plan also informs government programs on regional climate mitigation and adaptation.

   Climate Action Plan

2. **NetZero Innovation Centre:** Launched as a national hub for research and innovation, the Centre develops advanced technologies to achieve net-zero carbon emissions by 2060. Its findings and technological solutions support government efforts in industrial transition, emissions monitoring, and sustainability planning.

   https://x.com/u_tabuk/status/1912222065647812613?s=48

3. **Afforestation and Green Initiatives:** The *"1000 Trees"* initiative and the Permanent Tree-Planting Committee provide local authorities with data on green cover, carbon sequestration potential, and sustainable urban landscaping.

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   Strategic planning, maintenance, and monitoring of planted areas inform municipal decisions on urban forestry and biodiversity conservation.

   The Standing Committee for Afforestation at the University of Tabuk

   The Third Strategic Plan of the University of Tabuk (See page 34-35)

4. **Local Education Programmes and Community Awareness:** Initiatives such as the *Environmental Pioneers Challenge*, *Sustainable Fashion Workshops*, and *"Live and Let Others Live"* biodiversity campaigns raise community awareness, creating a local knowledge base that complements governmental climate monitoring and risk communication strategies.

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Leadership and Policy Engagement

The University actively collaborates with government leadership to enhance climate research, monitoring, and risk mitigation:

- Prof. Abdullah Al-Dhyabi, University President, met with Dr. Mohammed Al-Otaibi, Supervisor General of the Authority for Research, Development, and Innovation, and Prof. Abdulaziz Al-Malik, Deputy Minister of the Ministry of Environment, Water, and Agriculture for Research and Innovation.

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- These discussions focused on cooperative planning, research integration, and innovation strategies that inform national and regional climate policies.

Through research, strategic initiatives, education, and high-level engagement, the University of Tabuk informs and supports local and regional government in climate change risk monitoring, early warning, and disaster preparedness. Projects such as the Seed Bank, Climate Action Plan, NetZero Innovation Centre, and afforestation programs provide critical data, innovative solutions, and community engagement that strengthen regional climate resilience and align with Saudi Vision 2030 sustainability goals.

13.3.5 Environmental education collaborate with NGO

The University of Tabuk actively collaborates with non-governmental organizations (NGOs) and national environmental authorities to advance climate adaptation, biodiversity conservation, and sustainable development in line with Saudi Vision 2030. These partnerships integrate research, applied learning, and community engagement to address climate risks, promote ecosystem resilience, and support environmental sustainability.

Seed Bank Project and Biodiversity Research

In alignment with Environment Week 2025, the University, in partnership with the Saudi Environmental Fund, is implementing a specialized research project to establish a **Seed Bank in the Tabuk region**. The project involves:

- Field studies in Wadi Mushai to classify native plant species, estimate vegetation density, and collect seeds of rare and medicinal plants.

- Preservation and propagation of seeds to support regional

biodiversity and adaptive strategies for climate change.

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Additionally, applied learning initiatives within the **Diploma in Protected Area Management** at the Applied College include field training in **Neom Nature Reserve**, where students survey biodiversity, collect seeds, and learn advanced conservation techniques. This hands-on approach enhances the university's contribution to NGO-led conservation and climate adaptation efforts.

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Afforestation and Community Volunteering Initiatives

The Applied College branch in **Tayma** partnered with the **National Center for Vegetation Development and Combating Desertification (General Directorate of Pastures)** and the Tayma Municipality to plant local trees in the Centennial Park during the **2024 Tree-Planting Season**. This initiative, part of the *"We Plant for Our Future"* campaign, contributes to carbon reduction, ecosystem restoration, and local climate adaptation.

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Strategic MOUs and Partnerships with Environmental NGOs

The University has formalized collaborations with several national NGOs and authorities through **memoranda of understanding (MOUs)**:

National Center for Wildlife Development and **National Waste Management Center** – Cooperation in wildlife protection and sustainable waste management.

https://x.com/u_tabuk/status/1635926041989373955?s=48

National Center for Vegetation Development and Combating Desertification – Joint research and development programs, academic training, and environmental protection initiatives.

https://x.com/u_tabuk/status/1595848520086749185?s=48

Prince Mohammed bin Salman Reserve Development Authority – Collaboration on academic program development, specialized environmental research, and exchange of expertise.
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High-Level Engagement with Government and Research Authorities

The University fosters collaboration between NGOs, government, and research bodies:

Prof. Abdullah Al-Dhyabi, University President, met with **Dr. Mohammed Al-Otaibi**, Supervisor General of the Authority for Research, Development, and Innovation,

and **Prof. Abdulaziz Al-Malik**, Deputy Minister of the Ministry of Environment, Water, and Agriculture for Research and Innovation.

The discussions focused on **cooperative research, development, and innovation strategies** to enhance environmental sustainability and climate adaptation programs.

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Through its strategic partnerships with NGOs and environmental authorities, the University of Tabuk actively contributes to **climate adaptation** by:

- Conducting applied biodiversity research and seed conservation projects.
- Implementing afforestation and community engagement initiatives.
- Establishing formal collaborations and MOUs with key national environmental organizations.
- Engaging in high-level discussions to coordinate research and innovation for environmental sustainability.

These efforts demonstrate the University's commitment to **supporting NGOs and government authorities** in building climate resilience, preserving biodiversity, and implementing sustainable environmental solutions in the Tabuk region and beyond.

13.4 Commitment to carbon neutral university

13.4.1 Commitment to carbon neutral university

The University of Tabuk has demonstrated a strong commitment to achieving **carbon neutrality** in alignment with international standards such as the **Greenhouse Gas Protocols**. This commitment is part of the University's broader strategy to address climate change, promote sustainable development, and support Saudi Arabia's Vision 2030 environmental goals.

Climate Action Plan

Target Date and Strategy

- The University has set a strategic target to achieve **net-zero carbon emissions by 2060**, in alignment with national initiatives for sustainable industrial development and environmental conservation.

- This target is supported by multiple initiatives, including the **NetZero Innovation Centre**, which serves as a hub for research, development, and adoption of advanced technologies to reduce greenhouse gas emissions.

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Key Initiatives Supporting Carbon Neutrality

1. **Energy Efficiency Projects:**
    - The *"Tarsheed"* project focuses on improving energy efficiency across campus buildings and facilities, reducing energy consumption, and lowering carbon emissions.

https://www.spa.gov.sa/N2191965

    - The University received recognition from the **Saudi Energy Efficiency Center** for achieving **100% performance** in energy efficiency for 2023–2024.

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2. **Renewable Energy and Sustainable Technologies:**
    - Research and implementation of **renewable energy solutions** such as solar power and alternative energy sources are integral to the University's path to carbon neutrality.
    - The **NetZero Innovation Centre** develops technologies that enable industries and the University to transition to low-carbon operations.

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3. **Afforestation and Carbon Sequestration:**
    - The University implements large-scale tree planting initiatives, such as the *"1000 Trees"* project, to absorb CO_2 and offset campus emissions.
    - The Permanent Tree-Planting Committee ensures strategic selection, planting, and monitoring of tree growth to maximize carbon sequestration.
https://x.com/dsa_ut/status/1856306706403205515?s=48

The Standing Committee for Afforestation at the University of Tabuk

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4. **Research and Knowledge Dissemination:**
    - The University produces research on greenhouse gas reduction, sustainable energy, and climate resilience that informs both internal policies and regional government strategies.

- Publications and projects, such as energy efficiency studies, renewable energy research, and sustainable waste management, provide evidence-based pathways toward carbon neutrality.

Monitoring and Reporting

- The University plans to implement **monitoring systems** consistent with international Greenhouse Gas Protocols to track emissions, assess progress toward net-zero targets, and report outcomes to stakeholders.

- Combined with practical initiatives in energy, biodiversity, and carbon offset projects, these measures create a structured approach to achieve carbon neutrality.

Conclusion

The University of Tabuk is firmly committed to becoming a **carbon-neutral institution** by 2060. Through integrated strategies encompassing energy efficiency, renewable energy adoption, carbon sequestration via afforestation, and research-driven solutions, the University aligns with international standards and supports national climate objectives under **Saudi Vision 2030**.