Shaqra University

Annual Report of Shaqra University for Sustainability – (2024-2025)

Prepared in alignment Saudi Vision 2030, and the UN Sustainable Development Goals (SDGs)

Shaqra University Annual Sustainability Report

Shaqra University is committed to advancing sustainability as a core pillar of its vision, mission, and strategic priorities. Guided by the principles of Saudi Vision 2030 and the United Nations Sustainable Development Goals (SDGs), the university strives to integrate environmental responsibility, social impact, and economic efficiency into every aspect of its operations, teaching, research, and community engagement.

This Annual Sustainability Report highlights the university's achievements, initiatives, and continuous progress toward creating a greener, healthier, and more resilient academic environment. It provides an overview of our efforts in campus development, resource efficiency, digital transformation, waste management, transportation, and health and safety, as well as our contributions in education, research, and community partnerships.

Shaqra University recognizes that sustainability is not a single achievement but an ongoing journey. Through collective action, innovation, and collaboration, the university is building a culture of responsibility that inspires students, faculty, and staff to contribute actively to shaping a sustainable future for the Kingdom and beyond.

1. Setting and Restructuring

The report highlights the university's campus infrastructure, environmental initiatives, digital transformation, safety and health systems, and inclusivity measures that contribute to long-term sustainability.

Shaqra University, established in 2009, has been working to embed sustainability principles within its academic, administrative, and community operations. With its main campus located in Shaqra City, the university has integrated sustainable practices in infrastructure development, environmental management, and digital transformation.

Campus Setting and Infrastructure

The Shaqra Main Campus spans approximately 4.9 million m² and is located in a suburban area that supports sustainable expansion.

The Shaqra Main Campus is the flagship site of Shaqra University, located in Shaqra City, approximately 200 km northwest of Riyadh. It was officially established in 2009 as part of a national effort to expand higher education access in the Kingdom of Saudi Arabia.

The campus spans approximately 1.2 million square meters and is home to the university's central administration, as well as key academic and support units. It is situated in a suburban area, offering open spaces, landscaped grounds, and dedicated zones for sustainability-related development. Facilities include central administration buildings, specialized colleges, libraries, sports complexes, innovation hubs, student and staff housing, and healthcare services.

This location allows for sustainable expansion and the integration of green spaces and infrastructure, aligning with the university's environmental goals and Saudi Vision 2030.

The campus setting allows for the integration of green infrastructure, accessibility measures, and future sustainability projects.

Forest Vegetation Area: 13,500 m²

Zone Name	Area (m²)	Vegetation Type	Purpose
North Campus Tree Belt	5,000	Acacia, Tamarix	Wind barrier and habitat
West Academic Forest Strip	4,500	Date palm clusters	Shading and biodiversity
Staff Housing Green Buffer Zone	4,000	Mixed arid-native trees	Shade and recreational buffer
Total	**13,500**	—	—

Shaqra University has actively invested in tree-planting and reforestation efforts across its main campus in recent years. These efforts are visible in:

- Dense groves near the northern and western perimeter roads
- Planted tree belts surrounding academic buildings.
- Ecological landscaping around student housing and the administration zone

These green zones serve multiple purposes: wind protection, microclimate moderation, aesthetic improvement, and biodiversity enhancement.

Although Shaqra is located in a semi-arid region, the university has adapted with drought-tolerant tree species that simulate forest structure and promote ecological function. Shaqra University has established extensive planted vegetation across its main campus to improve environmental quality and enhance the visual appeal of the academic environment. These areas include:

- Grassy lawns and decorative gardens in front of main college buildings
- Shaded green courtyards with native shrubs.
- Palm-lined pedestrian paths and main entrances.
- Planters integrated into building design and walkways.
- Vertically planted areas at selected façades and boundary walls

All planted vegetation is selected to suit the semi-arid climate of Shaqra, using drought-tolerant and regionally adapted species.

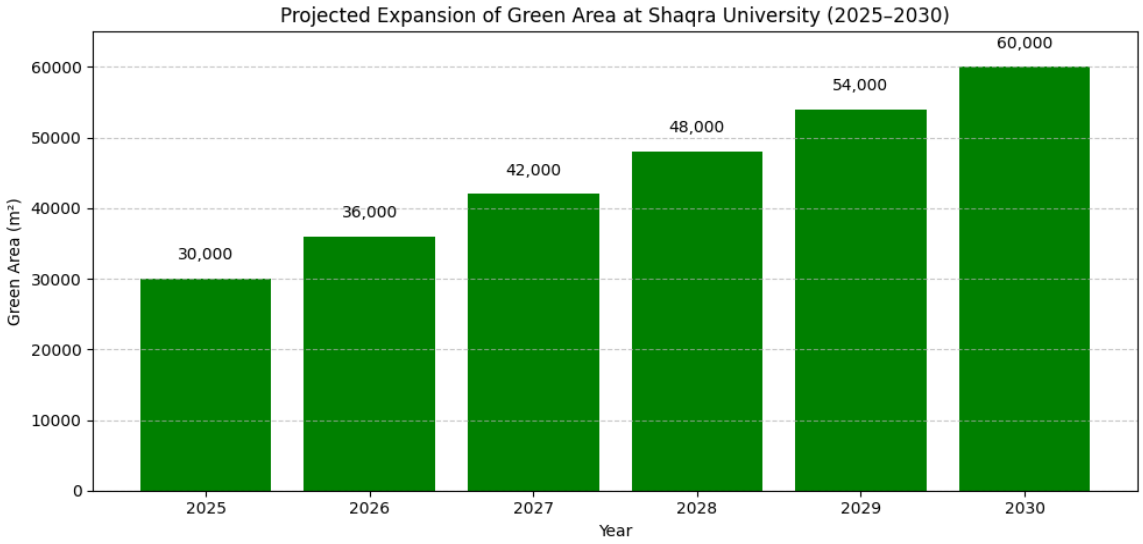
2. . Environmental Restructuring

Open and Green Spaces: 94.8% of the campus area is preserved as open space, including landscaped gardens, tree belts, and biodiversity zones.

Open space name	Total area	Duration (in Hours per Weeks)
Open Space Preserve	1.360.000 m^2	84
Putah Creek Riparian Reserve	2.590.000 m^2	168
UC Davis Arboretum	404.686 m^2	168

- Sustainable Landscaping: Use of drought-tolerant species such as Acacia, Tamarix, and date palms to minimize water consumption.
- Resource Efficiency: Adoption of smart technologies, paper reduction policies, and energy-saving practices.

Shaqra University has established a defined expansion plan for its landscaped zones. As presented in Table 1 the university aims to increase planted surface coverage by 6,000 m^2 annually from 2026 through 2030, ultimately reaching a cumulative total of 60,000 m^2 by the end of the decade. This initiative is directly aligned with the national Saudi Green Initiative and reflects the university's commitment to doubling its green footprint over a five-year period. The strategy is intended to enhance biodiversity, support carbon sequestration, and improve the ecological resilience and visual quality of the campus environment.



Annual green area expansion targets at Shaqra University, increasing from 30,000 m² in 2025 to 60,000 m² by 2030.

To complement these land use policies, the university has designated 2,000,000 m^2 for water absorption. These zones are composed of permeable soils, unpaved natural buffers, and stormwater infiltration systems that allow for effective groundwater recharge and flood mitigation, which is an essential consideration in arid regions with irregular rainfall.

Moreover, the university's infrastructure planning is grounded in inclusivity and well-being. All newly constructed buildings incorporate universal access design standards, ensuring facilities accommodate individuals with diverse physical needs.

Both campuses include dedicated health and safety features such as first aid stations, maternity support services, and gender-inclusive spaces. These efforts reflect a holistic interpretation of sustainability that integrates environmental, social, and institutional resilience. As part of this vision, Shaqra University has enhanced indoor environmental quality through passive design strategies including natural daylighting, high-ceiling atriums, and indoor greenery. These elements help reduce energy demand while promoting thermal comfort, air quality, and visual well-being.

3. Safety ,health and well-being

- Safety: CCTV surveillance, fire alarms, evacuation systems, and trained campus security.

- Health: On-campus clinics, preventive healthcare programs, and vaccination campaigns.

- Inclusivity: Facilities for persons with disabilities and maternity support (ramps, lactation rooms, daycare, golf carts).

Through restructuring and sustainable setting, Shaqra University demonstrates its commitment to environmental responsibility, digital transformation, and community well-being. These efforts not only enhance academic and operational outcomes but also position the university as a national and global model of sustainability in higher education.

4. Education for Sustainability

Courses and Programs

• Total Sustainability-Related Courses: 96 courses integrated across multiple disciplines, covering renewable energy, environmental engineering, water management, green chemistry, solid waste treatment, public health, and sustainable manufacturing.

• Key Courses include Environmental Physics, Solid Waste Management, Renewable Energy Physics, and Environmental Law.

• Sustainability-Related Academic Programs: 7 programs including Environmental Protection Technology, Solar Power Technology, Civil Engineering, Electrical Engineering, Physics, Biology, and Chemistry.

• Total Courses Offered by University: 1,148 courses, showing sustainability is integrated into the academic portfolio.

Sustainability-Related Academic Programs

Program Name	Level of Relation	Link to Sustainability
Environmental Protection Technology (Intermediate Diploma)	Highly Related	Covers waste, energy, climate, and infrastructure
Solar Power Technology (Diploma)	Highly Related	Specialized in renewable energy and clean technologies
Civil Engineering	Moderately Related	Courses in environmental engineering and sustainable infrastructure
Electrical Engineering	Moderately Related	Courses in renewable energy and smart systems
Physics	Low Related	Focus on renewable and nuclear energy

Biology	Moderately Related	Courses in ecology, pollution, and biotechnology
Chemistry	Low Related	Environmental analysis and green chemistry

5. Research for Sustainability

Between 2022 and 2024, Shaqra University allocated $1,345,239 USD for research, of which $229,333 USD directly supported sustainability-focused projects. Funding sources included Institutional Programs, Periodic Research Funds, High-Quality Programs, Open Access, and Scholar Funds.

Research Themes: Renewable energy technologies, pollution control, sustainable agriculture, environmental health, and water resource management.

Additionally, an estimated $229,333 USD was specifically directed toward sustainability-focused research, underscoring the university's alignment with environmental and sustainable development goals.

Faculty and Research Capacity: 200 lecturers and researchers engaged in sustainability-related studies and supervision in 2024.

6. Student Organizations and Activities

The university hosts 5 active student organizations dedicated to sustainability, engaging in awareness campaigns, volunteer initiatives, and environmental projects. Collectively, these groups dedicate over 1,600 hours annually to sustainability-related activities.

Organizations include:

- Ghayam Volunteer Team
- Sustainable Impact Volunteer Team
- Himmah Volunteer Team
- Environmental Volunteer Team
- Mulham Volunteer Team

Notable student-led activities include the Future Generations Environmental Awareness

Campaign and student participation in the National Center for Vegetation Cover Development (2024).

Cultural Activities

Shaqra University organized 12 major cultural events during the 2025 academic year, engaging thousands of participants and reinforcing national identity, heritage preservation, and cultural awareness.

Key activities included:

- “Labaik Howaitak” Cultural Forum (700 participants)
- “Dream and Achievement” Exhibition – National Day 94 (400 participants)
- Traditional Handicrafts Exhibition (900 participants)
- Academic and Cultural Competitions (2,557 participants)
- Traditional Craft Programs in arts, calligraphy, and pottery (309 participants)

Sustainability Community Service Projects

Shaqra University actively involves students in sustainability-driven community projects, including:

- Participation in the Shell Eco-Marathon 2025 (Qatar)
- Memorandum of Cooperation with Shell Global for renewable energy competitions (2025).

7. Graduate Outcomes

Between 2022–2024, 270 graduates secured green jobs, representing 1.74% of all graduates (15,483 total). Employment sectors include green engineering, environmental protection, sustainable agriculture, health and safety monitoring, and water treatment.

Future Focus: Expand career pathways in renewable energy and green industries to strengthen Saudi Arabia’s sustainability workforce.

8. Sustainable Transportation Vision

The University’s transportation vision focuses on:

- Reducing the dependence on private cars within campus boundaries.

- Encouraging the use of clean, shared, and zero-emission vehicles.
- Providing accessible, safe, and inclusive mobility for all community members.
- Integrating technology in transportation management and monitoring to ensure long-term sustainability.

Zero-Emission Vehicles (ZEV) Availability on Campus

Shaqra University has taken significant steps toward reducing carbon emissions by introducing **zero-emission vehicles**into campus operations.

- **Campus Shuttle Buses:** Internal bus services connect academic buildings, student residences, and administrative centers, reducing reliance on private cars.
- **Electric Golf Carts:** Widely available across campus to assist students, staff, and visitors—especially those with mobility needs—these vehicles ensure quiet, emission-free, and convenient travel.
- **Introduction of Electric Cars:** The University recently began operating **fully electric cars, such as Lucid models**, for administrative use.
- **Future Initiative:** A long-term plan is underway to expand the fleet of electric and hybrid vehicles and install **EV charging stations** across major campuses.

These initiatives reflect the University's progress toward achieving a **low-carbon transportation ecosystem**, in alignment with **SDG 11 (Sustainable Cities and Communities)** and **SDG 13 (Climate Action)**.

Ratio of Parking Area to Total Campus Area

Shaqra University continuously works to optimize land use by limiting parking expansion and dedicating more space to green and pedestrian zones.

- **Total main campus area:** 4,900,000 m^2
- **Total parking area:** 1,470,000 m^2
- **Parking ratio:** (1,470,000 / 4,900,000) × 100 = **30 %**

This balance helps control traffic congestion and encourages the use of collective and zero-emission transport options.

Program to Limit or Decrease Parking Area

To further discourage private vehicle usage, the University has adopted programs such as:

- **Campus Shuttle Buses:** Safe and efficient internal bus services connecting key areas.
- **Golf Carts and Electric Vehicles:** Providing clean mobility within campus boundaries.
- **Limited Parking Zones:** Parking restricted mainly to faculty and staff, managed by **electronic access systems**.
- **Pedestrian-Friendly Pathways:** Shaded walkways and crossings promote walking as a preferred mode of movement.
- **Smart Mobility Expansion:** Ongoing research into additional electric shuttles and digital mobility management systems.

Transportation Initiatives to Decrease Private Vehicles

Shaqra University implements several strategies to minimize the number of private vehicles on campus:

- **Bus Services:** Daily shuttle buses support student and staff mobility across multiple campuses.
- **Fleet Reduction:** Phasing out high-emission vehicles owned by the University.
- **Special-Event Shuttles:** Electric and hybrid shuttles are deployed during high-traffic events (e.g., graduations, forums) to manage congestion and cut emissions.

Pedestrian Path Policy

The University has adopted a **comprehensive pedestrian path policy** to ensure safety, comfort, and accessibility for all users.

Key components include:

- Separation between vehicle roads and pedestrian paths.
- Accessibility ramps and tactile blocks for people with disabilities.
- Adequate street lighting and marked crossings.
- Clear signage for organized pedestrian flow.
- Shaded walkways and green areas to enhance comfort.
- Regular maintenance for cleanliness and safety.

This policy underscores Shaqra University's dedication to creating a **safe, inclusive, and sustainable** campus environment.

Transportation Management Using ICT

The Deanship of E-Learning and Digital Transformation has modernized transportation management through innovative ICT applications:

Stage	Program/Activity	ICT Utilization	Responsible Department
Planning	Development of comprehensive digital transportation plan	Project-management tools, requirement analysis, and e-planning systems	Deanship of E-Learning & ICT Dept
Implementation	Integrated ID access via *Tawakkalna* app and *Electronic Bus Registration System*	Mobile-based access, automated bus assignment, geolocation mapping	ICT Dept, Transportation Unit
Monitoring	System performance tracking and dashboard analytics	Access logs, geolocation data, error detection reports	ICT Dept

Evaluation	Surveys and performance analytics	Online feedback forms, digital reports, data dashboards	Institutional Research & ICT Dept

9. Waste Management Report – 2025

Shaqra University has made substantial progress in waste reduction and sustainability. Across all campuses, the university achieved measurable decreases in paper, plastic, organic, inorganic, and toxic waste, supporting Saudi Vision 2030 and the UN Sustainable Development Goals (SDGs 6, 12, and 13). This report presents comparative data between 2024 (last year) and 2025 (this year) to evaluate improvements in waste generation, reduction, and treatment.

Summary of Waste Reduction

Category	Last Year (tons)	This Year (tons)	Reduction (tons)	% Reduction
Paper Waste	130	80	50	38%
Plastic Waste	400	300	100	25%
Organic Waste	1200	1000	200	16.6%
Inorganic (Non-toxic)	930	480	450	52%
Toxic Waste (E-waste, Lab)	1.7	1.2	0.5	29%
Total Reduction	2661.7	1861.2	800.5	30.1%

Paper and Plastic Waste (Inorganic Non-Toxic)

Shaqra University continues to strengthen waste management by reducing paper and plastic usage. Through digital transformation and policies restricting single-use plastics, the university achieved significant reductions.

Type	Last Year (tons)	This Year (tons)	Reduction (tons)	% Reduction
Paper	130	80	50	38%
Plastic (Soft + Hard)	400	300	100	25%
Construction Waste	400	100	300	75%
Total Inorganic Waste	930	480	450	52%

Organic Waste Management

Type	Last Year (tons)	This Year (tons)	Reduction (tons)	Treated/Reused (tons)	% Reduction
Food Waste	250	150	100	0	40%
Leaf & Garden Waste	50	50	0	0	0%
Water Waste	900	800	100	350	11%
Total Organic	1200	1000	200	350	16.6%

Toxic Waste (E-Waste and Chemicals)

Type	Last Year (tons)	This Year (tons)	Reduction (tons)	% Reduction
Electronic Waste	1.6	1.1	0.5	31%
Laboratory Chemicals	0.1	0.1	0	0%
Total Toxic Waste	1.7	1.2	0.5	29%

Shaqra University demonstrates a strong institutional commitment to sustainability and environmental responsibility**,** aligning its energy and climate change strategies with the United Nations Sustainable Development Goals (SDGs) and Saudi Vision 2030**.** The university's policies emphasize energy efficiency, smart infrastructure, renewable energy transition, and greenhouse gas reduction, with active collaboration between the Facilities and Operations Department and the National Energy Services Company (Tarshid)**.**

10.Energy Efficiency Initiatives

10.1 Energy-Efficient Appliances

Shaqra University has replaced a large portion of traditional lighting and HVAC systems with energy-efficient alternatives:

Appliance	Total Units	Energy-Efficient Units	Percentage
LED Lamps	58,500	35,000	60%
Air Conditioning Sensors	7,000	3,000	40%
Average Efficiency Coverage	—	—	**50%**

- Implementation includes LED lighting**,** light-detection sensors**, and** split air-conditioning systems**.**
- Natural daylight is maximized in classrooms and corridors to minimize artificial lighting

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10.2. Smart Building Implementation

Nine major university facilities integrate **smart automation technologies**, including automated lighting, HVAC controls, and water monitoring systems.

Parameter	Smart Building Area	Total Building Area	Percentage
Smart Infrastructure Coverage	124,635 m²	158,385 m²	**79%**

- Smart systems support real-time monitoring **and** data-driven energy optimization, enhancing operational sustainability

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10.3. Renewable Energy Development

Shaqra University is developing a ground-mounted solar energy project that will generate:

- 7.5 million kWh annually, equivalent to 22.6% of total electricity demand.
- Expected operational date: 2027.
- This project demonstrates the university's shift toward clean energy independence and reduced reliance on grid electricity

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10.4. Electricity Usage and Monitoring

Energy Type	Consumption (kWh/year)	Share of Total (%)
Total Electricity & Gas	33,237,465	100%
Solar Energy (Planned)	7,513,720	≈22.6%

Grid & Gas Usage	25,723,745	≈77.4%

- Data reflects complete operational demand across campuses, including academic, residential, and administrative buildings
- These values provide the baseline for the university's renewable integration and energy-saving targets**.**

10.5 . Green Building Implementation (EC.6)

Shaqra University integrates green building standards across all major non-residential facilities, incorporating:

- Energy efficiency systems (LED lighting, smart zoning)
- CO_2 monitoring & thermal comfort control
- Rainwater harvesting & sustainable materials
- Indoor environmental quality enhancement

Each facility applies at least three to five green building elements, improving occupant well-being and resource efficiency

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10.6. Greenhouse Gas Reduction and Carbon Footprint (EC.7 & EC.11)

Emission Reduction Measures

- Smart AC and lighting controls via motion and temperature sensors.
- Ongoing research on biomass, hybrid solar-wind systems, and solar panel efficiency.
- Ground-mounted solar project under construction to offset CO_2 emissions.

Carbon Footprint (2025)

Emission Source	CO_2 (Metric Tons)
Electricity	27,919.47
Buses (65 units)	2.18
Cars (574 units)	38.57
Total CO_2 Emissions	**27,960.23**

This represents the baseline for annual monitoring and future emission reductions once the solar system becomes operational

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10.7. Innovative Energy & Climate Change Programs (EC.9)

Shaqra University has introduced four main innovation programs that integrate research, operations, and student engagement

1. **Biophilic Cooling with Indoor Plants** – Reduces cooling load through passive regulation.
2. **Smart Lighting & AC Sensors** – Automated systems cut unnecessary energy use.
3. **Ground-Mounted Solar Project** – Occupies over one million m² of unused land.
4. **Student Research on Hybrid Systems** – Focused on biomass and solar-wind energy for local irrigation.

These innovations connect academic research with real-world applications, supporting sustainability-focused education.

Shaqra University has established a comprehensive and integrated water management system that addresses conservation, recycling, and efficiency within the context of Saudi Arabia's arid environment.

Its water initiatives support Saudi Vision 2030 and align with UN Sustainable Development Goals (SDG 6: Clean Water and Sanitation, SDG 12: Responsible Consumption and Production, and SDG 13: Climate Action)**.**

The university's programs focus on:

- Sustainable extraction and purification of groundwater.
- Recycling and reusing treated wastewater for irrigation.
- Installation of water-efficient fixtures.

- Planning for ICT-enabled water monitoring systems.

These combined efforts make Shaqra University a leading model in sustainable water management in desert regions

11. Water Conservation Program

Shaqra University operates a structured water conservation program through its groundwater purification and filtration systems. The main features include:

- Extraction from on-campus wells and advanced filtration to remove salts and balance pH for potable use.
- Low-flow fixtures (faucets, toilets) installed across academic and residential facilities.
- Preventive maintenance to reduce leaks and water loss.
- Student and staff awareness campaigns promoting responsible water use

Impact

- Reduced total freshwater consumption.
- Improved water quality and safety across residential and academic buildings.
- Enhanced awareness of sustainable water practices among the university community.

11.1. Water Recycling Program (WR.2)

Shaqra University operates a dedicated wastewater treatment and purification facility managed by the General Directorate of Projects and Facilities**.**

The system uses a **five-phase treatment process**:

1. Wastewater collection

2. Chemical neutralization
3. Biological treatment
4. Solid separation and sludge management
5. Storage and redistribution

The treated water is reused for irrigation through a closed-loop ring-main pipeline that covers forested and landscaped areas.

Statistical Results

Parameter	Value (2025)
Irrigated areas using treated water	65%
Target by 2030	100% coverage
Recycling process stages	5
System management	Central wastewater treatment facility

Impact

- Reduced reliance on municipal water supply.
- Supported reforestation and campus greening projects.
- Enhanced water-use efficiency and cost saving

11.2. Water-Efficient Appliances Usage

Appliance Type	Total Units	Water-Efficient Units	Implementation Rate
Toilets (WC)	320	150	46.9%
Hand-Washing Basins	450	300	66.6%

Awareness Signage	250	250	100%
Average Implementation Rate	—	—	**70.8%**

Complementary Actions

- Over 250 bilingual awareness posters installed in restrooms and common areas.
- Student-led initiatives and digital campaigns promoting water conservation

Impact

- Reduced daily water consumption per person.
- Promoted behavioral change toward sustainable water use.

11.3. Consumption of Treated Water

Shaqra University reuses treated wastewater for irrigation via its recycling facility.

Indicator	Value (2025)
Treated water use	30–40% of total water consumption
Irrigated area coverage	65%
System type	Closed-loop irrigation system

Treatment Phases

1. Wastewater collection
2. Neutralization
3. Aeration and biological treatment

4. Sludge separation
5. Storage for irrigation use

Impact

- Classified within >25%–50% treated water consumption category**.**
- Reduced groundwater extraction and operational costs.
- Strengthened resilience to water scarcity

11.4. Water Pollution Control (WR.5)

Due to its desert environment and absence of natural surface water bodies**,** water pollution control programs are not applicable to Shaqra University.

However, the university ensures environmental protection through:

- **Strict control of wastewater disposal**.
- **Reuse of treated water** instead of discharge.
- **Continuous awareness programs** for water conservation

11.5. ICT in Water Management

Planned Future Activation

Shaqra University plans to implement ICT-based monitoring systems for water management, aiming to:

- **Track real-time water consumption and detect leaks.**
- **Analyze water efficiency data through digital platforms.**
- **Automate irrigation scheduling.**

- **Establish a digital dashboard for performance evaluation.**

Expected Benefits

- Improved accuracy in monitoring and reporting.
- Enhanced accountability and data-driven decision-making.

Table 1: Overall Sustainability Statistics at Shaqra University (2024–2025)

Category	Indicator / Parameter	Statistical Result	Remarks / Impact
Campus Setting & Green Area	Total Campus Area	4.9 million m^2	Includes academic, residential, and administrative zones
	Forest Vegetation Area	13,500 m^2	Acacia, Tamarix, and date palm species planted
	Open and Green Space Ratio	94.8% of campus area	Promotes biodiversity and natural cooling
	Annual Green Area Expansion Target	+6,000 m^2 per year (2026–2030)	Part of Saudi Green Initiative
Energy Efficiency	LED Lighting Implementation	60% of all fixtures (35,000 out of 58,500)	Significant reduction in electricity use
	Energy-Efficient HVAC Systems	40% of total AC units (3,000 out of 7,000)	Tarshid collaboration
	Average Energy Efficiency Rate	50%	Across all buildings
	Smart Building Area	124,635 m^2 (79% of total area)	Automation in HVAC, lighting, and water systems
	Renewable Energy Generation (Planned)	7.5 million kWh/year	22.6% of total electricity needs, operational by 2027
	Total Electricity Consumption	33,237,465 kWh/year	Across all campuses
	Carbon Footprint	27,960.23 metric tons CO_2	Electricity is the main contributor
Water Management	Water-Efficient Fixtures	70.8% implementation rate	Toilets (46.9%), Basins (66.6%), Signage (100%)

	Recycled/Treated Water Use	30–40% of total water consumption	65% of irrigation area uses reclaimed water
	Target for Irrigation Coverage	100% by 2030	Closed-loop system via five-phase treatment
	ICT-Based Water Monitoring	Planned for 2026	Smart dashboards and leak detection
Waste Reduction	Total Waste Reduction (All Types)	30.1% reduction (from 2,661.7 to 1,861.2 tons)	Achieved through recycling and digital transformation
	Paper Waste Reduction	38% (130 → 80 tons)	Shift to digital systems
	Plastic Waste Reduction	25% (400 → 300 tons)	Ban on single-use plastics
	Organic Waste Reduction	16.6%	Food and water reuse systems
Transportation	Zero-Emission Vehicles (ZEV)	Electric buses, golf carts, Lucid cars	Ongoing fleet expansion
	Parking Area Ratio	30% of campus	Controlled expansion to promote public transport
	Pedestrian Path Policy	Implemented	Shaded, safe, and inclusive walkways
Education & Research	Sustainability-Related Courses	96 courses (out of 1,148 total)	Integrated across disciplines
	Sustainability Academic Programs	7 programs	Engineering, Environmental Tech, Biology, etc.
	Faculty/Researchers in Sustainability	200	Active in renewable energy, environment, and health
	Sustainability Research Funding	USD 229,333	Out of total USD 1.34 million research allocation
	Student Sustainability Organizations	5 teams	1,600+ hours annually dedicated to projects
Community & Culture	Cultural and Awareness Events	12 events annually	5,000+ total participants
	Green Jobs Graduates (2022–2024)	270 graduates (9.5%)	Employed in environmental and sustainable fields

Table 2: Overall SDG Impact and University Program Alignment

Sustainable Development Goal (SDG)	Goal Title	Aligned University Initiatives	Impact Summary
SDG 4	Quality Education	96 sustainability courses; 7 academic programs; research & innovation projects	Promotes knowledge and student engagement in sustainability fields
SDG 6	Clean Water and Sanitation	Water recycling, purification, efficient fixtures, ICT water monitoring	Ensures responsible water use and reuse in an arid environment
SDG 7	Affordable and Clean Energy	Solar farm project, LED & HVAC efficiency, Tarshid partnership	Reduces grid reliance and promotes clean energy adoption
SDG 9	Industry, Innovation, and Infrastructure	Smart buildings, ICT mobility, Tarshid & digital systems	Enhances innovation and energy-smart operations
SDG 11	Sustainable Cities and Communities	Green building design, inclusive campus planning, EV transportation	Builds sustainable, accessible campus communities
SDG 12	Responsible Consumption and Production	Waste reduction, water reuse, recycling programs	Strengthens efficiency in resource use and recycling
SDG 13	Climate Action	Carbon footprint reduction, renewable energy, awareness programs	Reduces emissions and fosters climate resilience
SDG 15	Life on Land	Vegetation areas, reforestation, use of native species	Preserves biodiversity and supports local ecosystems

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Conclusion

Shaqra University's sustainability framework reflects an integrated, data-driven, and results-oriented approach. Through measurable progress across **energy, water, waste, transportation, education, and research**, the university has demonstrated its commitment to environmental responsibility and long-term sustainability excellence.

Key highlights include:

- **50% energy efficiency coverage** and **79% smart building integration**.
- **65% irrigation coverage using recycled water**, advancing toward **100% by 2030**.

- **30.1% total waste reduction** through digitization and recycling.
- **96 sustainability-related courses** and **7 academic programs** fostering student engagement.
- **Carbon footprint baseline of 27,960.23 tons CO_2**, set to decline with solar activation in 2027.

Through collaboration with national entities such as Tarshid**,** and alignment with Saudi Vision 2030 and the UN SDGs**,** Shaqra University has emerged as a model of green transformation in higher education. Its future-focused initiatives—particularly in renewable energy, ICT water monitoring, and sustainable transportation—position it as a national leader advancing a sustainable, smart, and inclusive campus ecosystem.