

CAMPUS GREEN AREA REPORT

Landscaping, Sustainability & Green Space Initiatives

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Introduction

In line with Saudi Vision 2030, the Kingdom of Saudi Arabia has launched ambitious environmental initiatives to expand green spaces, enhance biodiversity, reduce carbon emissions, and improve the quality of urban life. National programs such as the Saudi Green Initiative and the broader vision for greener cities reflect the country's commitment to environmental sustainability, climate resilience, and responsible resource management.

Supporting these national aspirations, Alfaisal University is committed to creating a sustainable campus environment that promotes ecological balance, enhances the well-being of students and staff, and contributes to a healthier learning ecosystem. The campus currently maintains approximately 21,213 square meters of green space, featuring a diverse range of vegetation, including palm trees, ornamental and shade trees, shrubs, climbers, succulents, seasonal flowers, and ground covers. These landscape elements have been selected to create an attractive, resilient, and environmentally beneficial campus environment that is compatible with the local climate.

To ensure responsible water management, the University employs an automated irrigation system utilising sprinklers for lawns and dripper irrigation for trees, shrubs, and ground covers, supported by intelligent irrigation controllers and dedicated pumping infrastructure. The University's investment in green infrastructure contributes to several important objectives:

- Improving campus air quality through natural vegetation.
- Supporting carbon sequestration and mitigating greenhouse gas emissions.
- Reducing urban heat effects and enhancing thermal comfort.
- Increasing biodiversity within the campus landscape.
- Providing an aesthetically pleasing environment that supports learning, health, and well-being.
- Promoting efficient water use through modern irrigation technologies.

These efforts contribute to several United Nations Sustainable Development Goals (SDGs), particularly:

- SDG 3 – Good Health and Well-being: by creating healthier outdoor environments.
- SDG 11 – Sustainable Cities and Communities: through sustainable campus planning and green infrastructure.
- SDG 13 – Climate Action: by supporting carbon reduction and climate resilience initiatives.
- SDG 15 – Life on Land: by maintaining diverse plant species and enhancing urban biodiversity.

1. Campus Landscaping and Plant Diversity

The University's landscaping incorporates a diverse collection of plant species selected for their ornamental value, adaptability to local environmental conditions, and contribution to sustainable campus development. The following tables detail each plant category, including exact counts, areas, and the percentage of total campus area covered.

Palm Trees

Species	Approx. Size	Count	Area (m ²)	% of Campus
Washingtonia Robusta	3 m trunk	2	7.0	0.005%
Phoenix dactylifera (Date Palm)	4 m trunk	19	95.0	0.063%
Phoenix dactylifera (Date Palm)	6 m trunk	78	585.0	0.391%
Sago Palm	1.5 m trunk	12	36.0	0.024%
TOTAL	—	111	723.0	0.483%

Environmental Contribution

Well adapted to arid climates. Provide shade and visual identity. Require moderate irrigation once established. Contribute to urban greening while tolerating high temperatures.

Trees

Species	Approx. Size	Count	Area (m ²)	% of Campus
Plumeria Obtusa	1.5 m	55	220.0	0.147%
Conocarpus erectus	2–3 m	159	1,109.5	0.741%
Albizia	2.2 m	1	6.0	0.004%
Callistemon	2.5 m	22	66.0	0.044%
Ficus Religiosa	4 m	45	270.0	0.180%
Citrus limon 'Ponderosa'	1.5 m	1	3.0	0.002%
Vitex	2 m	7	632.0	0.422%

False Acacia	4 m	31	186.0	0.124%
TOTAL	—	321	2,492.5	1.665%

Environmental Contribution

These trees enhance biodiversity, improve air quality, capture atmospheric carbon dioxide, provide shade, and reduce localised heat. Several species exhibit good adaptation to warm climates and can thrive under managed irrigation conditions.

Shrubs

Species	Approx. Size	Count	Area (m²)	% of Campus
Tecoma stans	1.5 m	1	3.0	0.002%
Acalypha wilkesiana / Khalifa Plant	0.6 m	7	341.0	0.228%
Wedelia trilobata	0.02 m	17	200.0	0.134%
Ruellian	0.5 m	18	2,740.5	1.830%
Rosmarinus officinalis (Rosemary)	0.5–1 m	2	21.0	0.014%
TOTAL	—	45	3,305.5	2.208%

Environmental Contribution

Shrubs create layered vegetation, improve landscape aesthetics, reduce soil erosion, and support pollinating insects. Many ornamental shrubs are suitable for warm climates and require moderate water when maintained with efficient irrigation.

Climbers

Species	Approx. Size	Count	Area (m²)	% of Campus
Bougainvillea spectabilis	1 m	30	1,045.0	0.698%
TOTAL	—	30	1,045.0	0.698%

Environmental Contribution

Bougainvillea is highly drought tolerant once established and is particularly well suited to Saudi Arabia's climate. It provides vibrant seasonal colour while requiring relatively limited water compared with many ornamental flowering plants.

Succulents and Ground Covers

Species	Approx. Size	Count	Area (m²)	% of Campus
Yucca Gloriosa	0.75–2.0 m	2	4.0	0.005%
Agave Attenuata	0.5 m	10	10.0	0.007%
Alternanthera	~8 plants/m²	6	145.2	0.097%
Cyperus Alternifolius	1 m	4	129.6	0.087%
Cynodon Dactylon Grass	Groundcover	NA	13,134.0	8.722%
TOTAL	—	—	13,422.8	8.965%

Environmental Contribution

These species are generally recognised for their resilience, efficient water use, and suitability for landscaping in warm environments. Succulents and drought-adapted ground covers help reduce irrigation demand while maintaining attractive green spaces.

Seasonal Flowers

Species	Approx. Size	Count	Area (m²)	% of Campus
Yellow-Red Zinnia Angustifolia	0.01 m	1,200	150.0	0.100%
Zinnia	0.01 m	600	75.0	0.050%
TOTAL	—	1,800	225.0	0.150%

Seasonal flowering plants are incorporated throughout the campus landscape to provide visual enhancement, support biodiversity, and enrich the campus environment through changing colours and textures across different seasons.

Total Campus Green Area

Approximately 21,213 m² across all landscape categories

2. Sustainable Irrigation System

To maintain healthy landscapes while promoting responsible resource management, Alfaisal University operates an integrated irrigation system. The irrigation infrastructure is supplied through water tanks with capacities of 760 m³ and 486 m³, located in the basement of the Utility Building, and is supported by four Grundfos CR 15-4 pumps. The system consists of:

- Irrigation valves and fittings.
- Sprinkler systems for grass and lawn areas.
- Dripper irrigation systems for trees, shrubs, and ground covers.
- Microprocessor-equipped irrigation controllers.
- Pumping stations and water storage tanks.

Sprinkler Irrigation

Sprinklers are primarily used for grass and lawn areas, providing uniform water distribution across larger landscaped surfaces.

Dripper Irrigation

Dripper systems are used for trees, shrubs, and ground covers, delivering water directly to plant root zones. This method reduces evaporation losses, minimises water wastage, improves irrigation efficiency, and supports healthier plant growth through targeted watering.

Automated Irrigation Control

The irrigation process is managed through microprocessor-based irrigation controllers that automate watering schedules according to landscape requirements. Automation ensures consistent irrigation timing, efficient use of available water resources, reduced manual intervention, prevention of overwatering, and improved long-term sustainability of campus landscaping.

Combined Water Tank Capacity	1,246 m ³ (760 m ³ + 486 m ³)
Pumping Infrastructure	Four Grundfos CR 15-4 pumps
Irrigation Types	Sprinkler (lawns) and Drip (trees, shrubs, ground covers)

3. Environmental Impact and Sustainability Benefits

The University's green landscaping and water-efficient irrigation practices provide multiple environmental and institutional benefits, contributing to national sustainability goals and the well-being of the campus community.

- Enhancement of campus aesthetics and user experience.
- Improvement of local air quality through increased vegetation.
- Contribution to carbon sequestration and climate change mitigation.
- Reduction of heat accumulation within outdoor spaces.
- Support for urban biodiversity through diverse plant species.
- Conservation of water resources through automated irrigation technologies and targeted dripper systems.
- Alignment with sustainable campus management practices and national environmental priorities.

Framework	Contribution
SDG 3 – Good Health and Well-being	Creates healthier outdoor environments through improved air quality, shading, and biodiversity, enhancing the physical and mental well-being of students and staff.
SDG 11 – Sustainable Cities and Communities	Advances sustainable campus planning and green infrastructure development, contributing to resilient and liveable urban spaces.
SDG 13 – Climate Action	Supports carbon reduction and climate resilience through vegetation that sequesters CO ₂ , reduces heat, and promotes ecological balance.
SDG 15 – Life on Land	Maintains and enhances urban biodiversity through a diverse selection of plant species adapted to the regional environment.
Saudi Vision 2030 – Environmental Sustainability	Aligns with national green space, afforestation, and sustainable resource management goals.
Saudi Green Initiative	Contributes to the national programme to increase green cover and reduce carbon emissions across Saudi Arabia.

4. Photos

Campus Landscape Areas



Northern Inner Ring Landscaping



Southern Inner Ring Landscaping



Southeastern Outer Ring Landscaping



Northeastern Outer Ring Landscaping & Picnic Area

Irrigation System



Irrigation Pump Station



Irrigation Controller



Irrigation Sprinklers



Irrigation Drippers

5. Conclusion

Alfaisal University's green landscaping programme demonstrates a proactive commitment to environmental stewardship and sustainable campus operations. With approximately 21,213 m² of landscaped green areas, a diverse collection of plant species adapted to regional conditions, and an efficient automated irrigation network employing both sprinkler and dripper technologies, the University supports the goals of sustainable resource management while enhancing the quality of its campus environment.

These initiatives contribute to the University's broader sustainability agenda and align with Saudi Vision 2030, the Saudi Green Initiative, and the United Nations Sustainable Development Goals, reinforcing Alfaisal University's role in promoting environmental responsibility and creating a resilient, healthy, and sustainable campus for future generations.