

ARAB ACADEMY FOR SCIENCE, TECHNOLOGY AND MARITIME TRANSPORT

Living Campuses

Biodiversity at AASTMT, 2024–2025

How the Arab Academy grows, protects and studies life on land, from the Abu Qir Campus on the Mediterranean to the South Valley Campus in Aswan.

ABU QIR CAMPUS · HELIOPOLIS CAMPUS · SMART VILLAGE CAMPUS · EL ALAMEIN CAMPUS · PORT SAID CAMPUS

· SOUTH VALLEY CAMPUS, ASWAN

WELCOME

A green academy on a dry land

Egypt is one of the driest countries on Earth, and every tree, hedge and garden here depends on careful hands and scarce water. For more than a decade, the Arab Academy for Science, Technology and Maritime Transport (AASTMT) has looked after the plants and wildlife of its campuses, raised its own seedlings, and turned its research towards the conservation and restoration of Egypt's land, coasts and wetlands.

At a glance

8
campuses in 6 Egyptian governorates

213,646 m²
AASTMT Abu Qir Campus, the main campus

62,000 m²
planted vegetation at the Abu Qir Campus, about 30% of the campus

2
nursery inspections by the AASTMT President at the Abu Qir Campus (13 May 2024, 12 May 2025)

13
borehole wells that irrigate every green area at the Abu Qir Campus

6 days
UniGreen climate bootcamp at the Abu Qir Campus (May 2024)

4,765 m²
of planted green walls at the South Valley Campus, Aswan

5
South Valley Campus studies on trees, green walls and desert land published in 2024–2025

01 • GROW • PROTECT • DISCOVER • SHARE

Our approach

Four simple ideas guide our work on biodiversity across every campus.

Grow

We raise plants in our own nurseries at the Abu Qir Campus and use them to extend the green cover of our campuses, adding trees, hedges, green walls and green roofs where space is tight.

Protect

We care for mature trees, conserve soil and water, watch for invasive plants and favour species that suit Egypt's coastal and desert climate.

Discover

Our colleges study Egypt's ecosystems, from Red Sea mangrove forests and coastal wetlands to the deserts of Aswan, and test ways to restore them.

Share

We plant, learn and celebrate with students, schools, government and partners, every World Environment Day and throughout the year.

Our campuses in Egypt

AASTMT teaches and researches on 8 campuses in 6 Egyptian governorates, each in a different landscape: the Mediterranean coast at the Abu Qir, El Alamein and Port Said campuses, the desert edge of greater Cairo at the Smart Village and Heliopolis campuses, and the Nile Valley at the South Valley Campus in Aswan.



Abu Qir Campus
Main campus on the Mediterranean



Heliopolis Campus
Urban campus in the capital



Smart Village Campus
Desert edge west of Cairo



El Alamein Campus
Coastal desert of the North Coast



Port Said Campus
Between the Suez Canal and Lake Manzala



South Valley Campus
Hot desert of the Nile Valley

02 · TIMELINE

Two years of care, 2024–2025

From the planting nurseries of the Abu Qir Campus to research on greening the desert at the South Valley Campus, these are the dated milestones of 2024 and 2025.

3 May 2024	UniGreen bootcamp turns local ideas into climate and land-restoration businesses	ABU QIR CAMPUS
10 May 2024	Study shows which trees and grass best cool the El-Khazzan district of Aswan	SOUTH VALLEY CAMPUS
13 May 2024	Planting nurseries inspected by the AASTMT President as green areas expand	ABU QIR CAMPUS
30 Jul 2024	Blue carbon measured in grey mangrove forests on the Red Sea coast	ABU QIR CAMPUS
1 Sep 2024	Plan to reclaim desert land in Wadi Dihmit, Aswan	SOUTH VALLEY CAMPUS
23 Sep 2024	Cooperation protocol with MAFI for Agricultural Produce Industries	HELIOPOLIS CAMPUS
12 May 2025	Nurseries present new methods for plant maintenance and irrigation	ABU QIR CAMPUS
Sep 2025	Green walls keep Aswan homes up to 6 °C cooler on a 45 °C day	SOUTH VALLEY CAMPUS

03 · ABU QIR CAMPUS · MAIN CAMPUS SINCE 1972

Abu Qir Campus: green by the sea

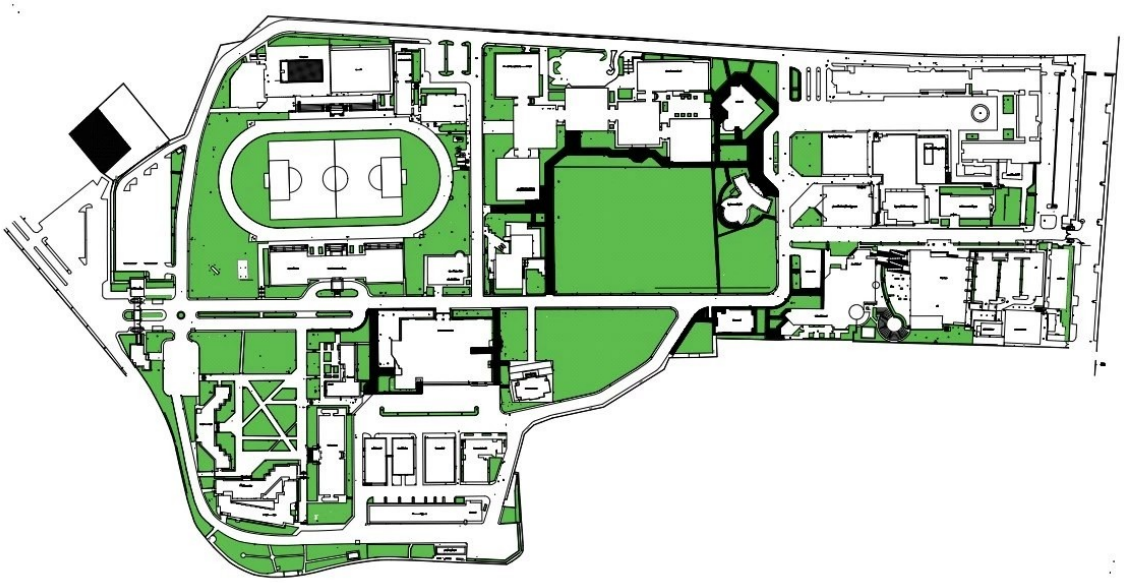
Our oldest and largest campus faces the Mediterranean at Abu Qir. Almost a third of it is planted: lawns, palms, shade trees, hedges and flower beds that shelter birds and insects and cool the campus in summer.

213,646 m²
total campus area (about 53 acres)

62,000 m²
planted vegetation (about 30%)

45%
of the campus is open space

13
borehole wells for irrigation



Planted vegetation (green) across the Abu Qir Campus.

A layered landscape

The campus vegetation is built in layers, each with its own role for wildlife and climate. Tall date palms, royal palms and fan palms form the upper storey; broad shade trees such as the rain tree and ornamental figs give dense canopy; clipped hedges of oleander and other shrubs line the walkways; and flower beds of hibiscus, croton and Mexican petunia add colour and food for insects. These plants are adapted to hot, dry summers, mild winters and the salty sea air of the coast.



Norfolk Island pine
Araucaria heterophylla



Ornamental fig
Ficus sp.



Rain tree
Samanea saman



Royal palms
Roystonea cf. regia



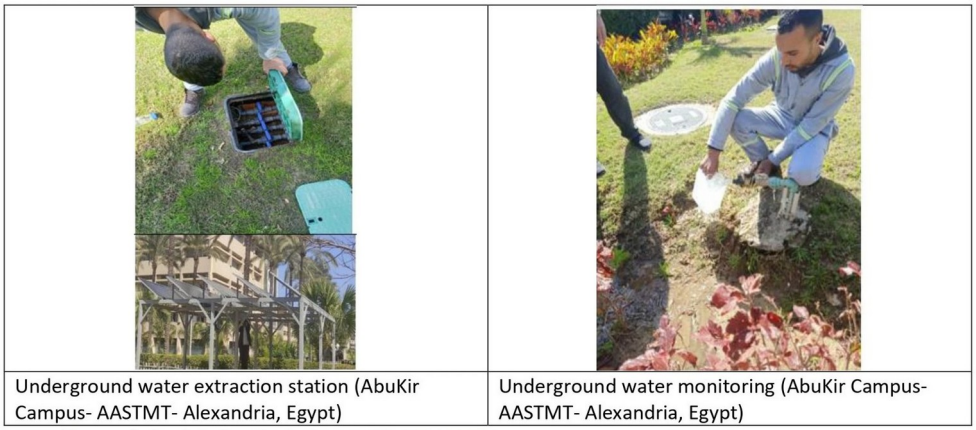
Garden croton
Codiaeum variegatum



Chinese hibiscus
Hibiscus rosa-sinensis

Water for every green area

Every lawn, palm and flower bed at Abu Qir is irrigated with non-drinking water. Thirteen borehole wells supply all irrigation: their water quality is tested every month. Rainwater from walkways and roofs is channelled into the gardens, and new planting basins use perforated-pipe irrigation instead of flooding. Today 27.8% of the campus's water comes from treated or non-potable sources.



Underground water extraction station (AbuKir Campus- AASTMT- Alexandria, Egypt)	Underground water monitoring (AbuKir Campus- AASTMT- Alexandria, Egypt)

The underground water extraction station and monthly water monitoring that supply campus irrigation, Abu Qir.

At the Aquaculture Research Center, a greenhouse collects rain in ten tanks and grows plants with hydroponic and aquaponic systems that use up to 90% less water than traditional farming.



Example of Water Conservation – Rain water harvest from roofs (AbuKir Campus- AASTMT- Alexandria, Egypt)



Example of Water Conservation – Rain water harvest from roof (AbuKir Campus- AASTMT- Alexandria, Egypt)

Rainwater harvested from the greenhouse roofs and stored in tanks, Abu Qir.



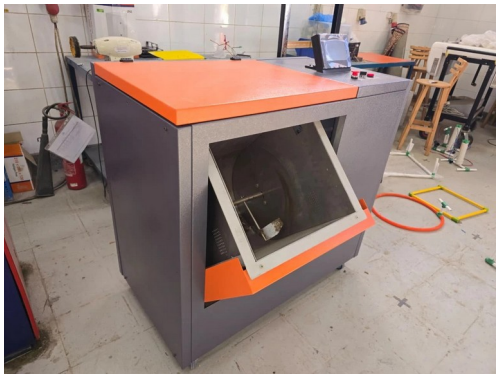


Hydrauponic system for agriculture

Hydroponic growing in the Aquaculture Research Center greenhouse, Abu Qir.

Feeding the soil

Food waste from campus kitchens goes into a composter unit that turns it into rich compost for the gardens, and a vermicomposting unit uses red wiggler earthworms (Eisenia fetida) to turn organic waste into nutrient-rich vermicompost. Healthier soil means healthier plants and fewer chemical fertilisers.



The campus composter unit



Red wiggler earthworms making vermicompost

Our planting nurseries

At the heart of the campus are AASTMT's own planting nurseries, where staff raise and care for the plants used to extend the green areas. The nurseries and the plant expansion works are inspected each spring by the AASTMT President.

13 MAY 2024 · ABU QIR CAMPUS

Nurseries keep growing

On 13 May 2024 the AASTMT President, Prof. Dr. Ismail Abdel Ghaffar, inspected the expansion of the planted areas and the latest technologies used to grow plants and nurture trees.

Read more: AASTMT news, May 2024

12 MAY 2025 · ABU QIR CAMPUS

Better ways to care for plants

On 12 May 2025 the AASTMT President, Prof. Dr. Ismail Abdel Ghaffar, toured the Abu Qir Campus planting nurseries, where staff presented their newest methods for plant maintenance and irrigation as the green areas of the campus continued to grow.

Read more: AASTMT news, May 2025



Nursery staff, May 2024



Planting nurseries, May 2025

Wildlife and the next steps

The lawns and trees of the Abu Qir Campus shelter birds such as crows. Two spreading ornamentals, creeping oxeye (Sphagneticola trilobata) and Mexican petunia (Ruellia simplex), known to be invasive in other regions, are watched and kept within managed beds under the AASTMT alien species policy.

The campus action plan sets out the next steps: mapping green cover in GIS, verifying every plant record, registering and protecting mature trees, planting more native and drought-adapted species, seasonal bird and pollinator surveys with students, integrated pest management, and an annual public update.

04 · SOUTH VALLEY CAMPUS, ASWAN · SINCE OCTOBER 2006

South Valley Campus: greening the desert

Aswan is one of the hottest cities on Earth. Summer days pass 45 °C and in July and August the air holds as little as 12% humidity. Here every plant counts, and our South Valley Campus and its researchers have made green walls, trees and desert land their field of study.

Oct 2006	3,250 m²	4,765 m²	6 °C
first classes on the South Valley Campus	campus building footprint	of planted green walls	cooler behind a planted green wall (2025 study)



The AASTMT South Valley Campus in Aswan.

> *"On a 45 °C August day in Aswan, a green wall kept the rooms behind it up to 6 °C cooler."*
>
> Field study by AASTMT South Valley Campus researchers, summer 2025 (submitted 19 Sep 2025, published 19 Jan 2026)

PUBLISHED 10 MAY 2024 · SOUTH VALLEY CAMPUS (EL-KHAZZAN DISTRICT, ASWAN)

Which trees cool a desert neighbourhood?

Researchers measured the microclimate of the El-Khazzan residential district for 24 hours on one of the hottest days of the year, then modelled different mixes of grass and the tree species Cassia leptophylla, Cassia nodosa and Ficus nitida.

Key figures District of 33,800 m², 13% built up. More trees lowered air temperature by up to 0.92 K; trees with grass lowered the felt temperature by 7.5 °C on average; 75% trees with 50% grass worked best.

Published in: Sustainability (MDPI)

PUBLISHED 1 SEP 2024 · WADI DIHMIT, EASTERN DESERT, ASWAN

Water to bring desert land back to life

Led by Shenouda Ghaly of the Civil Engineering Department at the AASTMT South Valley Campus, the team used satellite images, GIS and watershed models to map flash floods in Wadi Dihmit, the largest wadi in the Eastern Desert after Wadi Allaqi, and to choose a site for a dam that would store the water for reclaiming new farmland against desertification.

Key figures 4,925 km² studied, 25 km south-east of the High Dam; more than 34% sandy and valley deposits suited to reclamation; modern irrigation and heat- and salt-tolerant crops recommended.

Published in: Aswan University Journal of Environmental Studies

PUBLISHED 11 SEP 2024 · NEW ASWAN CITY

Shade trees for a campus courtyard

AASTMT South Valley Campus architect Abdelaziz Farouk Mohamed tested nine planting designs for a courtyard in New Aswan City with a partner campus, using field monitoring and simulation.

Key figures Planting 60% of the courtyard with the drought-adapted tree Cassia nodosa lowered the felt temperature by more than 25.4 °C and saved about 19.2% of cooling energy.

Published in: Urban Science (MDPI)

PUBLISHED 31 MAY 2025 · SOUTH VALLEY CAMPUS, ASWAN

Turning farm waste into cooler buildings

Rania Emad Abd El-Hady of the AASTMT South Valley Campus mixed Aswan clay with mushroom-farm waste to make lighter bricks, giving a second life to an agricultural residue.

Key figures At 15% waste the bricks conduct 62% less heat, and 45 cm walls cut annual cooling needs by 12.4%.

Published in: Journal of Engineering and Applied Science

SUBMITTED 19 SEP 2025 (PUBLISHED 19 JAN 2026) · NAGAA AL KARUR, ASWAN

Green walls on Aswan homes

Mohab Taher Abdelfatah and Menatallah Assem Elkholy of the AASTMT South Valley Campus monitored a residential building hour by hour and compared its bare brick wall with a wall covered in climbing plants and a planted green wall with an air gap behind it.

Key figures Outdoor peak 45.17 °C. Climbing plants: 1.55 °C cooler inside on average. Planted green wall: 3.59 °C cooler on average and up to 6.04 °C.

Published in: Journal of Umm Al-Qura University for Engineering and Architecture

PUBLISHED 9 SEP 2025 · SOUTH VALLEY CAMPUS, ASWAN

Gardens on the roof

AASTMT architects compared extensive, semi-intensive and intensive green roofs on an educational building in Aswan, showing how planted roofs can bring vegetation to the top of buildings and keep classrooms cooler.

Published in: Journal of Umm Al-Qura University for Engineering and Architecture

Nature on our doorstep

The South Valley Campus sits close to some of Egypt’s most precious landscapes: the shores of Lake Nasser, the Wadi Allaqi Biosphere Reserve on its eastern bank, and the Nile islands of the Saluga and Ghazal Protected Area just south of the city. Working with these protected areas on surveys and restoration is the next chapter of our work in Aswan.

05 · NORTH COAST · MATROUH

El Alamein Campus: life on the coastal desert

Our newest campus, the El Alamein Campus, stands in New Alamein, where the Mediterranean meets the Western Desert. It graduated its first class in August 2024 and is a place to study the plants of the coastal desert.



The AASTMT El Alamein Campus in New Alamein.

24 AUG 2024 · EL ALAMEIN CAMPUS

A first graduation on the North Coast

The El Alamein Campus graduated its first class on 24 August 2024, in the presence of Arab League Secretary-General Ahmed Aboul Gheit and Minister of Higher Education Mohamed Ayman Ashour, representing the Prime Minister. Egypt's Minister of Agriculture and Land Reclamation, Alaa Farouk, spoke of AASTMT's role in educating young people and researchers; AASTMT lists the event among its SDG 15 actions.

Read more: AASTMT news

26 OCT 2024 · EL ALAMEIN CAMPUS (EL DABAA FARMS)

Learning from medicinal-plant farms

Students of the AASTMT El Alamein Campus visited a medicinal-plant farm in El Dabaa, Matrouh, to see how plant species are grown, harvested and processed.

Read more: AASTMT news

ONGOING · EL ALAMEIN CAMPUS

Every drop for the land

The campus is built with a rainwater drainage network and a hospital wastewater treatment unit, so that water can be safely reused for irrigation and kept out of natural water bodies.

06 · RESEARCH FROM THE ABU QIR CAMPUS

Coasts, wetlands and forests

AASTMT's colleges at the Abu Qir Campus study ecosystems far beyond the campus: mangrove forests on the Red Sea, wetlands of the Nile Delta, city trees, and new technology to watch over forests and stop invasive plants.

30 JUL 2024	**Blue carbon in grey mangroves.** Carbon measured in the sediments and vegetation of Avicennia marina stands along Egypt's Red Sea coast (Kareem Tonbol). AASTMT research project page (Oct 2021 – Sep 2022)
17 APR 2025	**Moving green walls.** Dynamic vertical green walls for teaching buildings in a Mediterranean city. Published in F1000Research
4 NOV 2025	**Listening to trees.** Fibre-optic sensors in tree trunks and a drone-mounted spectrometer track forest health in real time (Port Training Institute). Published in IEEE Access

07 · RESEARCH FROM GREATER CAIRO

Heliopolis and Smart Village campuses: soils, deserts and cities

At the Heliopolis and Smart Village campuses, AASTMT researchers study how to protect desert plants, rebuild soils, plant trees where people need shade, and understand the world's forests.

23 SEP 2024 · HELIOPOLIS CAMPUS (CEREMONY AT THE ST REGIS ALMASA, NEW ADMINISTRATIVE CAPITAL)

Partners for agricultural industries

AASTMT President Prof. Dr. Ismail Abdel Ghaffar and MAFI founder Ahmed Abou Hashima signed a cooperation protocol linking the College of Management & Technology at the Heliopolis Campus with the agricultural produce industry, on the sidelines of the College's graduation ceremony on Monday 23 September 2024.

Read more: AASTMT news

31 JAN 2024	**Biochar from farm waste.** Rice straw, sawdust, sugarcane and tree leaves turned into biochar to restore soils (W. Abbas, Osama M. Morsy). Published in Scientific Reports
13 MAY 2025	**Where to plant trees.** AI-driven design to place trees for the best shade in hot, dry public spaces. Published in Scientific Reports
8 JUL 2025	**A biodiversity hotspot from space.** Satellite analysis of water in Borneo's forests (Mohammed Magdy Hamed). Published in Theoretical and Applied Climatology

08 · COMMUNITY AND COOPERATION

People, partners and wildlife

Biodiversity is a shared task. Our students, staff and partners in Egypt and abroad have planted, studied and campaigned for nature.

3 MAY 2024 · ABU QIR CAMPUS

UniGreen: green businesses for climate and land

Participants in the EU-funded UniGreen competition, led by the Life Makers Foundation with AASTMT, completed a six-day bootcamp at the Abu Qir Campus to turn local ideas into climate-focused businesses. AASTMT lists the bootcamp among its SDG 15 actions for land restoration and ecosystem protection.

Key figures Six-day bootcamp; funded by the European Union.

Read more: AASTMT news

5–6 JUN 2024 · WORLD ENVIRONMENT DAY

Green environment, green tourism

For World Environment Day 2024 AASTMT organised an international workshop on green tourism and environmental protection with the Italian Cultural Institute and the Egypt Future Foundation, opened by AASTMT Vice President Dr. Alaa Abdel Bari. AASTMT presented its TouMaLi marine-waste project, UniGreen with the Life Makers Foundation, and Green Med.

Read more: AASTMT news

Projects with partners

OCT 2022 – SEP 2027	**RURALITIES.** A Horizon Europe project building climate-smart, ecosystem-enhancing rural training hubs across Africa and Europe; AASTMT receives €41,718.75. Horizon Europe project 101060876
APR 2024 – MAR 2027	**Pro-GREEN-LABs.** Joint urban labs on green competences with European and Egyptian partners, coordinated from Weimar, Germany. AASTMT news
OCT 2025 – OCT 2027	**HEEFTA.** Environmental education linking people and nature across six Mediterranean countries; AASTMT share €130,592. AASTMT news
OCT 2025 – SEP 2028	**SAFER.** Climate-resilient, sustainable farming in higher education. AASTMT news

09 · OUR COMMITMENTS

Looking ahead to 2030

The next five years will build on everything in these pages.

01 No net loss of green cover

Every new building and campus, including the Al Burouj and El Alamein campuses, will be planned to keep and extend its green spaces.

02 Plants from our own nurseries

The Abu Qir Campus nurseries will supply plants for the revegetation of all campuses.

03 Native and water-wise

New planting will favour native and drought-adapted species, irrigated only with groundwater, treated water and rain.

04 Watchful care

Mature trees will be registered and protected, and invasive plants monitored on every campus.

05 Restoring Egypt's ecosystems

We will work with protected areas such as Wadi Allaqi and Saluga and Ghazal, and build on our mangrove research on the Red Sea coast.

06 Open reporting

We will publish an update on our campuses' biodiversity every year.



Palms, lawns and walkways at the Abu Qir Campus.

Reporting period: January 2024 – December 2025. Published by the Arab Academy for Science, Technology and Maritime Transport (AASTMT). Photographs: AASTMT.