FAFS ECO-UNIT

A Living Laboratory for Sustainability

American University of Beirut
Faculty of Agricultural & Food Sciences

AUB American University of Beirut

BOLDLY THE CAMPAIGN TO LEAD, INNOVATE & SERVE

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Vision

The FAFS ECO-UNIT will be a showcase for sustainable agro-ecological practices and offer a snapshot of what the future could be. Located on the AUB campus, it will be a prototype of integrated agricultural, landscape, conservation, and food practices. The ECO-UNIT will expand the educational, research, and community outreach activities of the faculty by implementing examples of best practices to demonstrate connections across disciplines and sectors. The FAFS ECO-UNIT will be a catalyst for stewardship of the land by disseminating knowledge and know-how of sustainability within and outside the University.

The FAFS ECO-UNIT will be located within the richly vegetated Middle Campus of AUB.

Impact

The FAFS ECO-UNIT will have an impact through its collaborative, participatory, and outreach activities within the University and throughout the region.

• Within AUB, collaborations among FAFS departments and across disciplines including engineering, architecture, business, and health sciences will make sustainability a guiding principle of the University.

• At the community and national levels, outreach activities to schools and other universities will engage students and faculty in promoting the project. The FAFS ECO-UNIT will serve as a catalyst for further teaching and research collaboration with other educational institutions.

• At the regional level, the FAFS ECO-UNIT will be a research hub for integrated sustainable practices to replicate the experience across countries in the Middle East and North Africa region. This will allow the development of networks in which participants can share experiences on sustainability at multiple levels.

Promoting sustainability in the region

Sustainable development is a global priority to ensure that natural resources are available for present and future generations. There is a great need to provide young adults with academic training in various disciplines related to sustainable development of urban and rural communities.

Current outreach and teaching activities will be an integral part of the ECO-UNIT.

An educational ECO-UNIT, a living laboratory

The Faculty of Agricultural and Food Sciences (FAFS) at the American University of Beirut (AUB) promotes the health and well-being of people and nature as part of its commitment to a more sustainable world. To achieve this mission FAFS provides its students with experiential learning to ensure that young men and women who join the work force are well trained in issues of regional concern and are ready to serve as agents of change in the region.

FAFS teaches its students to tackle sustainability through the rational use of water, to address the challenges of urban greening of cities in hot and arid climates, and to protect the region's natural and cultural heritage through informed and intelligent design and planning.

What are AUB strengths in this area?

FAFS has been offering experiential learning opportunities for its students since its establishment in 1952 on its campus and at the AREC (Advancing Research Enabling Communities) center, a 100-hectare facility in the Beqaa Valley, 80 km from Beirut. Students enrolled in the agriculture program receive hands-on training at AREC in various aspects of production agriculture including agronomy, horticulture, weed science, irrigation, soil science, poultry science, and animal science. To accommodate students enrolled in the food science and management program, FAFS has built a pilot plant to provide hands-on training on basic aspects of food tasting, food processing, and food safety. The faculty has also invested in a facility dedicated to providing hands-on training for students enrolled in nutrition and dietetics. FAFS uses the resources of the AUB campus to train its students in landscape plant identification and care.

What do we want to accomplish?

FAFS would like to build on its extensive experience in experiential learning by setting up an ECO-UNIT to provide students with opportunities to learn about principles of sustainability. The ECO-UNIT would be open to any AUB student who wants to learn about sustainability in an urban context. The ECO-UNIT will also be a resource for all members of the university community who are interested in finding out about best practices in natural resource conservation and sustainable use. The ECO-UNIT will include an outdoor teaching and outreach facility and will showcase green roofs, green walls, composting and vermicomposting, biofuel production, rain water collection and re-use, sustainable farming and gardening demonstration lots, and bee-keeping.

It will also feature energy-saving equipment and material for open spaces. To promote community outreach the ECO-UNIT will house the Environmental and Sustainable Development Unit (ESDU) – a research and develop team specialized in rural community development.

Students involved in research on native plants and alternative methods of greening urban areas through hands-on projects.

What is needed?

An extensive upgrade and renovation is required to transform existing facilities to a state-of-the-art ECO-UNIT that provides unique outdoor learning opportunities.

Students and instructors involved in testing native wild plants and their adaptability in urban contexts.

FAFS ECO UNIT | Master Plan

The project will be located on a 1,800 m2 plot of land that is part of the AUB campus and is managed by the Faculty of Agricultural and Food Sciences.

Project components

The project includes agriculture research facilities, urban greening research facilities (green roofs and walls), a solar power generation plant, underground rain water storage, a sustainable agriculture experiment plot, student experiment plots, outdoor classrooms for hands-on teaching, soil, a compost area, a rain water retention pond, native and climatically adapted plants research, and a center for outreach and community activities.

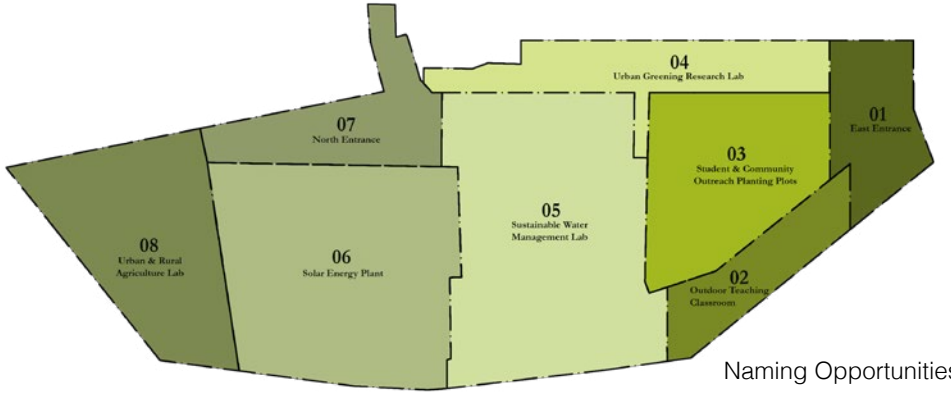
Project principles

The project is based on several sustainable principles including: sustainable landscape and building design; Mediterranean character design with local materials; energy self-sufficiency through solar, wind, and algae; water self-sufficiency through rain water collection, storage, and re-use; sustainable agriculture practices; food production through urban agriculture techniques (vertical agriculture, hydroponics, aquaponics, etc.); and urban greening (green roofs, walls, and public space). Throughout the project there will be continuous scientific monitoring, data generation, and sharing.

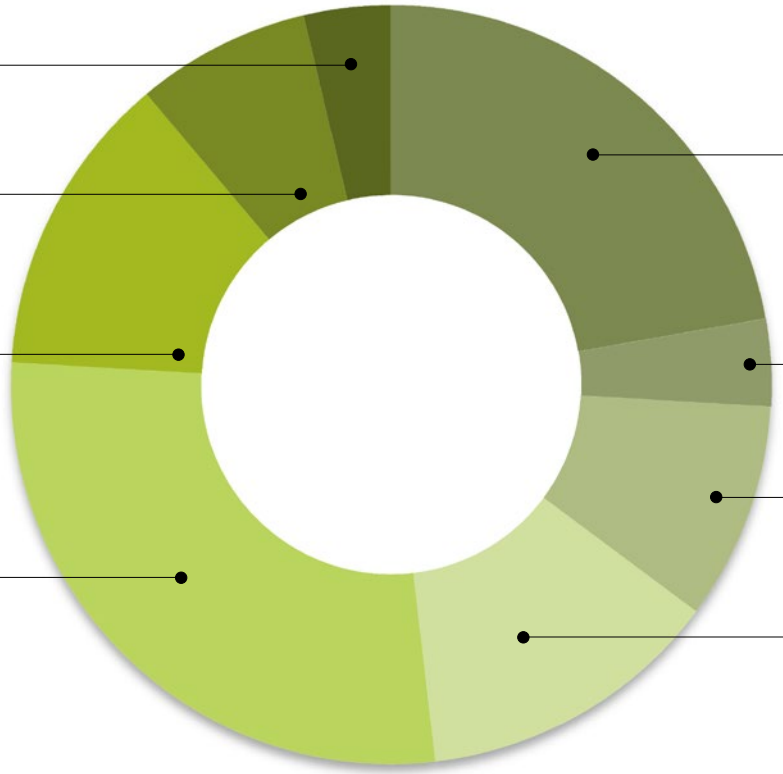
Plan

Naming & donation opportunities

With your support, the existing space and facilities will be transformed into a state of the art ECO-UNIT. The ECO-UNIT or one of the eight components can be named as detailed below.



Naming Opportunities



01 East Entrance

Area: 214 m²
Budget: $ 100,000

02 Outdoor Teaching Classroom

Area: 195 m²
Budget: $ 200,000

03 Student & Community Outreach Planting Plots

Area: 438 m²
Budget: $ 350,000

04 Urban Greening Research Lab

Area: 306 m²
Budget: $ 750,000

08 Urban and Rural Agriculture Lab

Area: 484 m²
Budget: $ 600,000

07 North Entrance

Area: 268 m²
Budget: $ 100,000

06 Solar Energy Plant

Area: 782 m²
Budget: $ 250,000

05 Sustainable Water Management Lab

Area: 872 m²
Budget: $ 350,000

East Entrance

The East Entrance is the main pedestrian entrance to the project and provides an overview of the new facilities. From this vantage point, one can see the outdoor teaching classroom, student and community outreach planting plots, and the urban greening research lab framed by native and Mediterranean plants. The East Entrance can be named for a donation of $100,000.

Existing conditions of east entrance

Proposed east entrance

North Entrance

The North Entrance is a second access point to the ECO-UNIT. Vehicular and service access is provided through sustainable landscape best practices using previous hard-scape material allowing water to percolate into the ground aquifers. The North Entrance can be named for a donation of $100,000.

Existing north entrance

Proposed north entrance

Outdoor Teaching Classroom

The Outdoor Teaching Classroom provides Landscape Architecture students with outdoor learning experiences to complement their indoor instruction. The enhanced facilities provide new opportunities to conduct design studios, plant classes, and outreach activities. The new facility includes specially designed outdoor furniture and bleachers. The Outdoor Teaching Classroom can be named for a donation of $200,000.

Existing conditions of outdoor classroom

Proposed outdoor classroom

Solar Energy Plant

The Solar Energy Plant is located on the roof of an existing building within the ECO-UNIT. The photovoltaic panels will be a solar energy production plant and is intended to run all equipment on site. The plant will be a prototype at AUB for energy self-sufficiency. Energy generation will be monitored. The data that is collected will be used to inform other applications within and outside AUB. The Solar Energy Plant can be named for a donation of $250,000.

Existing conditions of pilot plant

Proposed solar energy plant

Sustainable Water Management Lab

Water is a precious resource especially in the Middle East region. Through collecting rain water from the upper campus via a rain water garden and storing it under planting plots, the system demonstrates the possibilities of self-sufficiency as well as responsibility to the environment by regenerating ground water aquifers. The Sustainable Water Management Lab can be named for a donation of $350,000.

Existing conditions of water system elements

Proposed rain water collection

Student and Community Outreach Planting Plots

The Community Outreach Planting Plots are intended to engage the AUB community in the process of growing food. The area includes 2 x 2 meter plots that AUB community members can rent for a minimal fee to grow their own food. Some of these plots will also be used for teaching and research. In addition, the rain water that is collected and stored underground will ensure water self-sufficiency within the ECO-UNIT. The Student and Community Outreach Planting Plots can be named for a donation of $350,000.

Existing conditions of planting plots

Proposed planting plots

Urban and Rural Agriculture Lab

The Urban and Rural Agriculture Lab includes experimental agriculture plots used by graduate students and professors to test methods that provide maximum yield while being environmentally and socially sustainable. The area comprises a new state-of-the-art green house as well as plots with seasonal and crop rotation. A new building with an area of 200m2 includes laboratory and research space that supports and advances innovative ideas. The Urban and Rural Agriculture Lab can be named for a donation of $600,000.

Existing agricultural plots

Proposed agricultural plots and green house

Urban Greening Research Lab

The Urban Greening Research Lab responds to the contemporary focus of improving the quality of life in cities. In addition to inside laboratory and research facilities measuring 140m2, the building includes experimental green roofs, green walls, and overall site landscape where we test the suitability of different native plants. Green roofs and building façades hold promise as a way to address several challenges in cities related to hot climates, food provision, energy savings, and biodiversity. Native and fruit trees are tested and monitored for their hardiness as street trees similar to what has been done with orange trees in Seville, Spain and olive trees in Amman, Jordan. The experimental roofs, façades, and street trees focus on research and applications relevant to the Middle Eastern and Mediterranean climates that also have health and environmental benefits. The Urban Greening Research Lab can be named for a donation of $750,000.

Green roofs for building energy saving and biodiversity enhancement

Green roofs for food production and raising pollinating bees

Proposed facade of the research lab

Proposed research lab

Inquiries

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Credits

Yaser Abunnasr (Project Idea, Concept, and Design) | Mahmoud Bou Kanaan (Renderings) | Rouba Dagher (Analysis) | Omar Aridi & Mahmoud Bou Kanaan (Survey) | Basma Ibrahim & Rodan Imad (Brochure Design).

Departments of Agriculture, Landscape Design and Ecosystem Management, and Nutrition and Food Sciences at the Faculty of Agricultural and Food Sciences (financial support for preliminary design drawing).