

## Template for Evidence(s) UI GreenMetric Questionnaire

University : Alexandria University  
Country : Egypt  
Web Address : <https://alexu.edu.eg/> ...

### [2] Energy and Climate Change (EC)

#### [2.13] Number of innovative program(s) in energy and climate change

<p>1</p>	 <p style="text-align: center;"><b>( Second HEEPF Project )</b></p> <p style="text-align: center;"><a href="http://www.areac-agr.com">www.areac-agr.com</a></p> <p style="text-align: center;">E-Learning Lab</p> <p style="text-align: center;">EVACUATED TUBE SOLAR COLLECTOR</p>
<p style="text-align: center;">Solar Energy Center at the Faculty of Agriculture (Alexandria University)</p>	
<p>2</p>	 <p style="text-align: center;">Old HYRESS system</p> <p style="text-align: center;">New STDF system</p>
<p style="text-align: center;">Windmill and Solar Panels (Solar Energy Center at the Faculty of Agriculture - Alexandria University)</p>	

2



Solar Energy Center at the Faculty of Agriculture (Alexandria University)

3



BIPV Façade Brise-Soleil System  
Solar Energy Center at the Faculty of Science (Alexandria University)



BIPV Roof Pergola, Faculty of Science in Moharram Bek (Alexandria University)



BIPV Garden Pergola, Faculty of Science in Moharram Bek (Alexandria University)



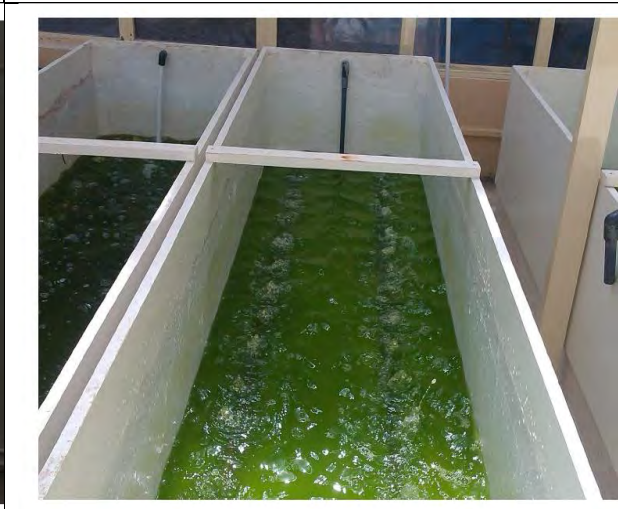
Production of Bio-Diesel from Algae in Selected Mediterranean Countries: Med-Algae Project (Faculty of Science, Alexandria University)



Algae Cultivated In Flat Panel Photo-Bioreactor, Med-Algae Project (Faculty of Science, Alexandria University)

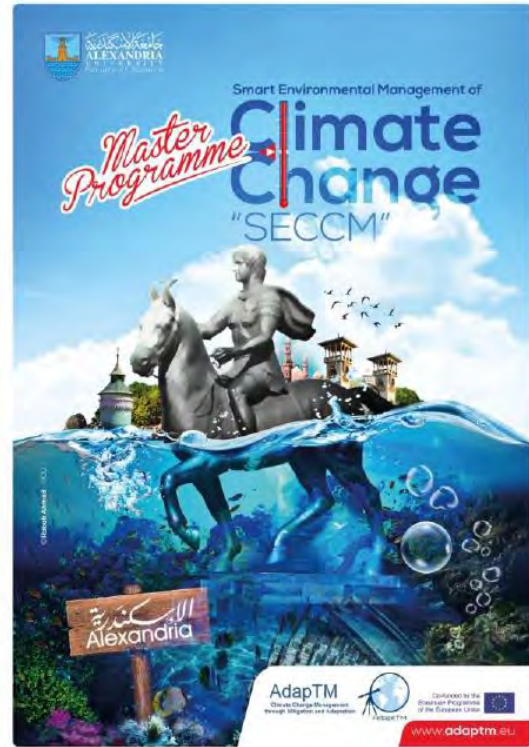


Seawater tank outside the chamber, Med-Algae Project (Faculty of Science, Alexandria University)




Open Ponds with running algal cultures, Med-Algae Project (Faculty of Science, Alexandria University)

5



Smart Environmental Management of Climate Change Master Program (Alexandria University, Egypt)

6



## FishAqu Project

A consortium of eight EU & Egyptian universities are establishing a modern, needs-oriented master study programme on fisheries and aquaculture.

Sustainable Management of Fisheries and Aquaculture Science Master Program (Alexandria University, Egypt)



Co-funded by the  
 Erasmus+ Programme  
 of the European Union



**M.Sc. in:**  
**Natural Resources Sustainability for Land Development (NRSLD)**  
 Under the framework of SuReMap project  
 (Sustainable Resource Management Programme to solve Deserted Challenges)

**SuReMap Project:**

Aims to establish interdisciplinary programs that train students to address water, energy & food-related challenges in "Egypt's 2030 strategy".

NRSLD is an outcome of the SureMap Erasmus+ project that includes a consortium of 8 Egyptian and European universities. The program is cooperatively designed by the consortium, therefore; it has the advantage of the international and interdisciplinary perspective, European framework of recognition, and benefits from a wide network of participating professors from the following universities: RWTH Aachen, Heliopolis University, Alexandria University, CITY College – Sheffield University, The American University in Cairo, University of Palermo, Aswan University, and Technical University of Madrid.

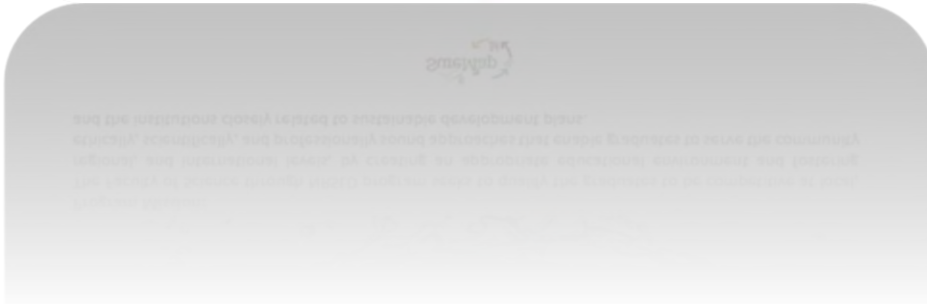
**Program Vision:**

NRSLD program aims to prepare students with the knowledge and experience for the management and sustainable development of drylands' natural resources in the local, regional, and international related sectors.



**Program Mission:**

The Faculty of Science through NRSLD program seeks to qualify the graduates to be competitive at local, regional, and international levels, by creating an appropriate educational environment and fostering ethically, scientifically, and professionally sound approaches that enable graduates to serve the community and the institutions closely related to sustainable development plans.



8



Solar photovoltaic with a capacity of 220 kilowatts on the 2000 m<sup>2</sup> roof top of the building of the Mechanical Engineering Department at the Faculty of Engineering (Alexandria University, Egypt)

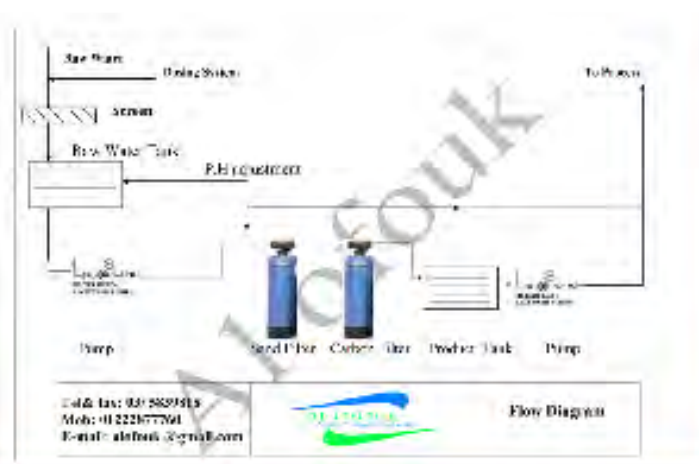
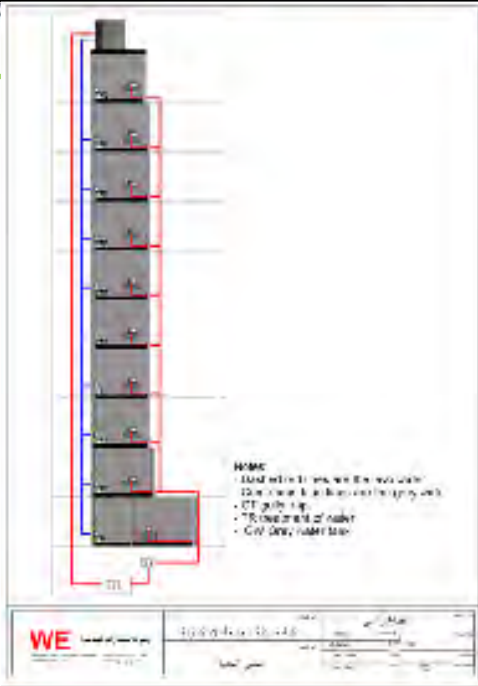
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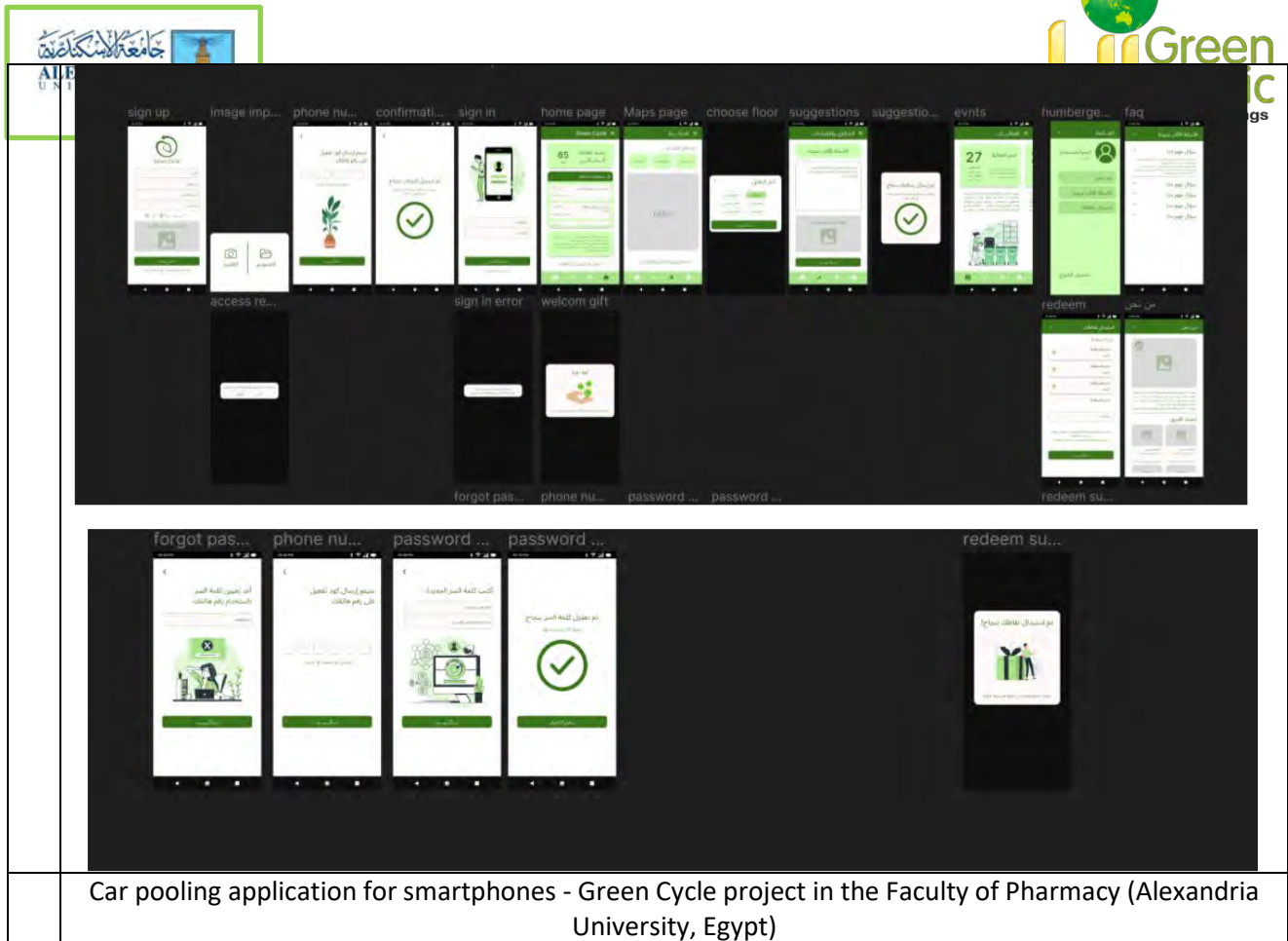


Green Cycle project in the Faculty of Pharmacy (Alexandria University, Egypt)



Grey water recycling system - Green Cycle project in the Faculty of Pharmacy (Alexandria University, Egypt)





Car pooling application for smartphones - Green Cycle project in the Faculty of Pharmacy (Alexandria University, Egypt)

**Description:**

**1-The Faculty of Agriculture has 2 renewable energy centers and on center at the main building of the University.**

a) The renewable Energy Center in Wadi Natrun.

There are two units from the network:

- 7 kw hybrid unit for photovoltaic cells and 5 kw for air turbine.
- 50 kw hybrid unit for photovoltaic cells and 50 kw for air turbines (under maintenance).

They are all used in student training and research for graduate students and faculty members.

b) The renewable Energy Center at the Agriculture Research and Experiments Station in Abis Campus.

- The capacity of the center is 130 kw/h connected to the electricity grid.

**2- Solar Energy Center at the Faculty of Agriculture (Alexandria University)**

- The center along with partner from Greece, Germany, Spain Morocco and Tunisia awarded a Six Framework project (FP6 project) from the European commission to developed Hybrid renewable energy system to supply service for Mediterranean partner countries.
- The center representing AU and Las Palm University in Spain awarded a project from the Spanish Cooperation Spanish Agency for International Co-Operation (AECE), in the area of water desalination by Renewable Energy.
- Recently with cooperation with the Faculty of Engineering, the center awarded an STDF project. The project title is "Development of hybrid renewable energy - RO desalination system and minigrids for remote and desert areas in Egypt (HAREDES)".

The Center Goals are to:

- Remove the knowledge barriers against the installation of RE systems in Egypt.
- Enhance the utilization of renewable energy.





- Develop educational and e-learning program about renewable energy.
- Educate students, graduates, public and key stakeholders in Egypt and the Arab world on the various sources of renewable energy and its successful applications.
- Build the infrastructure necessary to develop, install and maintain renewable energy applications.
- Present a show case or a model for the successful utilization of renewable energy in Egypt.
- Continue excellence in all of our educational programs.

#### The services provided by the center:

- Research and development:** Encouraging applied research on renewable energy at AU and through collaborations with other national and international universities. Development of hybrid systems in renewable energy and its uses in water pumping and water desalination and development of remote and desert areas. Development of research in energy from biomass and waste. Development of thermal uses of solar energy.
- Consultations:** Various consultations in renewable energy systems, especially hybrid systems, drying and solar heating.
- Education and Training:** Supporting the renewable energy education at AU. Developing and delivering courses, e-learning, workshops, training courses, and conferences on various renewable energy systems.
- Serving the Egyptian community by providing all renewable energy information to the public.

#### Equipment at the center:

- The center has many devices for different applications of renewable energy.
- A hybrid system to generate electricity from the sun with a capacity of about 130 kilowatts.
- E-learning courses on the site ([www.areac-agr.com](http://www.areac-agr.com)).

System Application	Solar System power kWp	Air Turbine power	Energy (kWh)
Wadi El-Natroon 1, Photovoltaic cells	7		7000
Wadi El-Natroon 2, Photovoltaic cells	50		50,000
Wadi El-Natroon 1, Air turbines		5	5000
Wadi El-Natroon 2, Air turbines		50	50,000
Abis Campus			130
University Main building			20
	Total Power (kWp)		112,150

### 3- The Faculty of Science:

**Research Project:** Development and implementation of decentralised solar-energy-related innovative technologies for public buildings, in the Mediterranean Basin

System Application	Number of modules	Solar System kWp	Power (kWh)
BIPV façade brise-soleil	120	17.28	26350
BIPV garden pergola	90	8.1	23270



BIPV roof pergola	30	4.1	
	Total Power (kWh)		49,620

**Ratio of renewable energy production divided by total energy usage per year**

No	Renewable Energy	Production (in kWh)
1	Solar panel	57,150 + 49,620
2	Windmill	55,000
	<b>Total</b>	<b>161,770</b>

Environmental Benefits

Life time CO <sub>2</sub> emission savings	556,935 kg
Life time SO <sub>2</sub> emission savings	2,004 kg
Life time NO <sub>x</sub> emission savings	668.322 kg

**4- The Faculty of Science:**

**Research Project:** Production of Bio-Diesel from Algae in Selected Mediterranean Countries: Med-Algae Project

**The project objective is to explore:**

- 1- The development of microalgae-based biodiesel production and other valuable products in six Mediterranean countries (Cyprus, Egypt, Greece, Italy, Lebanon and Malta).
- 2- The current level of technology, the relevant market structure, and the governmental and environmental boundaries will be mapped in the participating countries, in order to identify the most promising strategies in each country.

Studied Strains Chlorella sp was chosen to be the common examined strain between the partners. In addition, native algal strains from each participant country were isolated and identified. Both Chlorella sp and locally isolated microalgae have been examined under lab and out-door scale.

**Additional evidence link:** <https://alexu.edu.eg/index.php/about-us-ar>

**Link for LED lighting:**

[https://alexu.edu.eg/index.php/?option=com\\_content&view=article&id=5935&catid=21&lang=ar-AA](https://alexu.edu.eg/index.php/?option=com_content&view=article&id=5935&catid=21&lang=ar-AA)

**Link for Solar Energy:**

[https://alexu.edu.eg/index.php/?option=com\\_content&view=article&id=5936&catid=21&lang=ar-AA](https://alexu.edu.eg/index.php/?option=com_content&view=article&id=5936&catid=21&lang=ar-AA)

**Link for Sustainable Development:** <https://alexu.edu.eg/index.php/en/sustainable-development>

**Link for Green University:**

[https://alexu.edu.eg/index.php/?option=com\\_content&view=article&id=5932&catid=21&lang=ar-AA](https://alexu.edu.eg/index.php/?option=com_content&view=article&id=5932&catid=21&lang=ar-AA)

**5- Smart Environmental Management of Climate Change in collaboration with Catania University, Italy**

2 year Postgraduate Master program (4 semesters).

AdapTm-Erasmus project: The participating countries and Universities: Italy, Greece, Lithuania, Slovenia, Egypt (Alexandria University, Suez Canal University, South Valley University, Arab Academy for Science and Technology and Maritime Transport).

Program start date: year 2019

**Link:** <https://emuni.si> › ADAPTM-handout\_2\_Mod

**6- Sustainable Management of Fisheries and Aquaculture Science, in collaboration with University of Aveiro, Portugal.**

2 year Postgraduate Master program (4 semesters).



(Erasmus+ Project, European Union): The participating countries and Universities: Portugal (University of Aveiro), Italy, Croatia, Slovenia, Egypt (Alexandria University, Aswan University, Matrouh University, Arab Academy for Science and Technology and Maritime Transport).



Program start date: year 2021

Link: <http://fishagu.eu>

### **7- Natural Resources Sustainability for Land Development in collaboration with Aachen University, Germany**

2 year Postgraduate Master program (4 semesters).

Erasmus+ Project, European Union: The participating countries and Universities: Germany (RWTH Aachen), Egypt (Alexandria University, Heliopolis University, the American University in Cairo, Aswan University), Cyprus (CITY College – Sheffield University), Italy (University of Palermo), Spain (Technical University of Madrid).

Program start date: year 2022

### **SureMap-Project**

#### **Sustainable Resource Management Programme to solve Desert-ed Challenges**

The aim of this project is to establish an Engineering MSc that trains engineers, suitably qualified to implement the “1.5 million feddan desert reclamation” target, as well as similar water, energy and food related challenges in the “Egypt 2030” strategy. The curricula content is oriented towards the need to combine know-how in solar technology, hydrology, and irrigation with mechanical, electrical, soil engineering and urban planning as well as ecological and environmental aspects.

#### **Link:**

YouTube: <https://suremap.eu>

facebook: <https://www.facebook.com/suremapproject>

LinkedIn: <https://www.linkedin.com/company/suremap-project>

### **8- The Faculty of Engineering - Alexandria University**

The implantation of the new Solar Station is completed. The implementation of the solar photovoltaic panels was performed in December 2022 with a capacity of **220** kilowatts on the 2000 m<sup>2</sup> roof top of the building of the Mechanical Engineering Department at the Faculty of Engineering.

**Alexandria University** have generalized this initiative in some of the faculties of Alexandria University in gradual stages.

### **9- Applying green building concepts in the Faculty of Engineering - Alexandria University in 2020.**

The buildings of the Faculty of Engineering - Alexandria University were chosen to be the nucleus from which to implement green building concepts regarding the general vision for applying environmentally friendly green building requirements to the Faculty of Engineering buildings (Report is attached).

In the report, the faculty buildings were studied, and the summary of the report was as follows:

1. Mechanical Engineering Building: Complies with green building requirements (LEED) with the silver category.
2. Preparatory building: conforms to green building requirements (LEED) with the silver category.
3. Administration building: It does not currently comply with green building requirements (LEED), but it is possible with simple modifications to adopt it.
4. Electrical Engineering Building: It does not currently comply with green building requirements (LEED), but it is possible to adopt it with simple modifications.

### **10- Fab Lab Project in the Faculty of Engineering - Alexandria University**

The overall goal of the project is to develop the circular and creative economy model by creating an innovation place equipped with machines Low Tech in Alexandria is hosted by Alexandria University. This place will play a



role in creating local dynamism Transversal to become a crossroads between different audiences and actors from different backgrounds. To connect waste collection Plastic and its evaluation. Horizons Solidarités and the University of Corsica, in partnership with their peers in Alexandria, based on their experience in Fab Lab Corte, conduct experiments on recreating value for plastic in Alexandria. The goal is to connect all actors from assembly through training to development and dissemination.

#### **The scope of work in the project**

- **Environment, climate, and energy**
- **Education, social aspect, and research**

These goals will be implemented through the establishment of a FabLab within Alexandria University, which is a space for innovation. Derives place this innovation is energized by a generation that has innovative ideas in the fields of environment, citizenship, and culture. This revival is embodied in women and the men who are partners in the project. The high skills of Alexandria University and Senghor University, Francophone operator in Alexandria, ensures the long-term commitment of their students and the sustainability of the local dynamism. Implementation benefits from facilities Headquarters provided by Alexandria University Project Engine. VSI contributes to the unification of links between regions. Project depends on the Alexandria Business Association (ABA), a trade organization that invests in creating startups in the circular economy and selling finished products. A multi-representative consortium from both sides of the Mediterranean could be formed from these dynamics that will support the project over time.

The French side confirmed that the Fab Lab at the University of Corsica in France has become a very successful experiment on the economic and environmental levels, and is considered one of the most important strategic projects in France and receives the attention of the French Presidency and the Mediterranean region. The French side explained that it seeks to benefit from the expertise of Alexandria University, and that they are fully prepared. To provide full support for the project and coordinate with the relevant authorities in France for the success of this experiment, which will benefit both sides on the environmental, economic and environmental levels.

Led by the South Region and its partner Alexandria Governorate, this project aims to be part of an inter-regional dynamic with the participation of the **Corsican community**. This project is part of the “Zero Plastic Waste” regional strategy in the Mediterranean. It is also part of the dynamics of the memorandum signed on September 5, 2022 between the region and IUCN Med on the occasion of the World Nature Congress in Marseille, which aims to develop joint actions for the benefit of a Mediterranean region without plastic. On the other hand, this project is part of the context of the twenty-seventh session of the Conference of the Parties held in Egypt. It joins the global effort undertaken by the Egyptian state in order to effectively combat the effects of climate change. Its realization in Alexandria makes it possible to structure a permanent cooperation with the governorate around a symbolic project that will, in the long term, enhance the social impact of research and university cooperation. In addition, this project promotes decentralized cooperation between the three regions. Indeed, supporting this project will highlight the role of the region, Alexandria Governorate, and Corsica in supporting innovative solutions to adapt regions to changing Climate. The strategy is based on four pillars: **digital communication in three languages, the production of digital communication media intended for the general public, organizing competitions for artists and architects from the two countries to enhance the innovative role Fab Lab, and discussions of ideas supported by all partners as a regional facilitator**. In addition, a dedication ceremony for the Fab Lab will be held in the presence of elected officials, governors, university presidents, and will be followed by the symposium in Alexandria is a continuation of COP 27, which was held in November 2022.

A system for monitoring and evaluating the project will be developed by members of the steering committee with the support of specialists. The monitoring and evaluation system will include the quantitative, qualitative, and financial components of the project. It will make it possible to measure the effectiveness of this place of innovation as a driver of sustainable and inclusive development at the local and Mediterranean levels. Indicators for this monitoring and evaluation system will be identified and validated by the Steering Committee at the beginning of the project to verify throughout the implementation period whether the results are consistent expected meets set goals. Answers will need to be provided to the items specified in the reference system approved by the Steering Committee.



### Link for Fab Lab Project

<http://alexu.edu.eg/index.php/%D8%A3%D8%AD%D8%AF%D8%AB-%D8%A7%D9%84%D8%A3%D8%AE%D8%A8%D8%A7%D8%B1/6840-%D8%AC%D8%A7%D9%85%D8%B9%D8%A9-%D8%A7%D9%84%D8%A5%D8%B3%D9%83%D9%86%D8%AF%D8%B1%D9%8A%D8%A9-%D8%AA%D8%A8%D8%AD%D8%AB-%D8%A5%D9%86%D8%B4%D8%A7%D8%A1-%D9%85%D8%B9%D9%85%D9%84>



### 11- Green Cycle project in the Faculty of Pharmacy - Alexandria University

Within the framework of the Faculty of Pharmacy's tireless endeavour to meet the needs of the community inside and outside the university and to contribute to solving contemporary health, social and economic problems, in line with the vision of Alexandria University, which is based on the principles of comprehensive quality and continuous and sustainable development, in harmony with the state's development plan "Sustainable Development Strategy: Egypt Vision 2030":

The college is advancing the "Green Circle" project, which is a non-profit project that seeks to keep the environment clean and green in a sustainable way by growing plants to increase green spaces, as well as separating waste for recycling and establishing charitable markets to benefit from used clothes and use electricity-saving alternatives such as energy saving lamps.

The project began in October 2022 by organizing a number of events in cooperation between the Community Service and Environmental Development Committee, ASPSA, and the Alexandria Rotary Clubs, under the supervision and organization of Faculty of Pharmacy - Alexandria University.

Also, the faculty is seriously seeking in the next stage to implement a grey water (wastewater) recycling system that depends on reusing wastewater from sewage basins only (without using wastewater from laboratory basins) by re-pumping it into the flushing bins in the toilets after work. Filtration and primary treatment.

#### Project goals:

1. Spreading awareness of the need to maintain the cleanliness of the Faculty of Pharmacy campus.
2. Spreading green spaces and landscaping on the campus of the Faculty of Pharmacy.
3. Reuse of wastewater from septic tanks only by pumping it back into the flushing bins of the toilets after primary treatment.
4. Taking advantage of rainwater for use in irrigation and regulatory operations.
5. Reducing the individual carbon footprint of students, faculty members and college employees by developing an application, prepared for smart phones, specific to the project that enables college members to share cars for transportation in a safe manner in order to reduce carbon emissions resulting from car exhausts.
6. Waste recycling, the most important of which is paper collection, as it has one of the highest recycling rates more than any other waste at the University.

The Green Circle Project is an integrated system that has many positive and direct impacts on the environment at the Faculty of Pharmacy, and provides a model that can be emulated in the colleges and institutes of Alexandria University, as providing a clean, sustainable environment has good effects on the mental and physical health of students, faculty members, and college workers, which makes them feel its value. They like to be there and keep it clean. Therefore, this project will lead to indirect results on the productivity of college employees, as well as transferring them to a culture of sustainability in preserving the environment outside the college walls.

The grey water recycling initiative has a significant impact on rationalizing water use and thus saving the college's monthly water bills, which constitute a burden on the budget.

Introducing the concept of car sharing among university students will reduce the costs of going to college.

Also, the presence of students and workers in a clean environment will improve overall performance.

#### What has been implemented of the project so far

- The trees around the college campus were trimmed, cut, sprayed, and maintained, and the plants spread at the college entrance were taken care of.
- Attention was paid to recycling wood waste from exam tables and chairs and converting them inside the college workshops with carpenters from the college into boxes for flowers and plants.
- A partnership contract was signed with some parties to dispose of hazardous waste.



• Awareness seminars were held for college members about the importance of preserving the environment and educating young people about climate change.

- 23 waste collection points have been distributed for recycling.
- 75 seedlings of ornamental plants were planted to create an aesthetic appearance and work to increase the green area. These plants are being cared for and increased in number.
- A running and walking marathon was held to encourage reduced use of strollers.
- Many charity markets have been set up to recycle clothes.
- The faculty lighting has been changed to use energy saving lamps.
- A complete design for grey water recycling has been developed and is awaiting university approvals.
- A team of faculty students developed an application, prepared for smartphones, to serve the project ideas and encourage active participation in it. The first phase has been completed and will be launched simultaneously with the study.
- A preliminary concept for rooftop farming has been developed.
- Planning to plant the faculty wall has been completed and is awaiting university approvals.

#### **Future plan of the project:**

- Increasing the rates of afforestation within the college and increasing the green area in the college through two main axes:
- Cultivation of the college's surfaces.
- Constructing a wall parallel to the college wall, 55 meters long and 40 centimetres deep. This wall contains 40 fruit trees, including lemon, olive, and orange trees. This phase will begin in September 2023.
- Launching the application for smartphones.
- Implementing environmental awareness programs at the beginning of study on policies that can be followed to reduce waste production on campus, and to reduce the consumption of paper, plastic, and metals on college campuses.
- Preparing an integrated file about the initiative in the universities and schools and communicating with the Governor of Alexandria to activate the idea. In various government facilities in Alexandria, which brings financial and environmental benefits to the bride of the Mediterranean.
- Generalizing the initiative to the rest of the governorates of the Arab Republic of Egypt, ensuring a cleaner environment and a less polluted and brighter future for future generations.

#### **Green circle supplement:**

##### **Medicinal plant extraction unit (Environmentally friendly unit):**

The medicinal plant extraction unit is a model unit for preserving the environment and its resources greatly because it contains devices that help reduce the use of organic solvents that are harmful to the environment and reduce water waste in general.

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<https://www.figma.com/file/Szikt682DveoqpQD4VYxKz/green-cycle?type=design&node-id=0-1&mode=design>



## **New projects managed by Alexandria University:**

- 1) Green hydrogen and green ammonia production for KIMA Aswan Company
- 2) Localization of the electric vehicle industry in Egypt
- 3) Alexandria Water and Energy Services Company (AWESCO)
- 4) Suez Canal impact on reducing shipping emissions
- 5) Egypt as an international energy hub and enhancing its energy mix
- 6) Egypt as an international hub for electronics design and manufacturing
- 7) Coastal protection and flood management for Alexandria Governorate
- 8) Alexandria Center for Greener Blue Economy
- 9) Alexandria Sustainable Development Center of Excellence (ASD)