

13.3.2 University Climate Action plan, shared with local government and/or local community groups

Integrated strategy Project for rainwater management in Alexandria Governorate in cooperation with Alexandria University

Remote sensing technology was used to know the current values of Rain and assess the current situation with the help of satellites. This is done with the help of the following artificial satellites:

-TRMM and GPM are two of the NASA satellites. (Administration National Aeronautics and Space Administration, United States of America)

- NOAA (National Oceanic, Atmospheric, and Space Administration, United States of America)

- NCEI (National Center for Environmental Information in the United States of America)

Proposed rain management strategy

A separate network will be created to drain rainwater for the nearest body of water for areas close to the body of water. The first area is the Corniche, where rainwater is collected and discharging it into marine estuaries. The second area is on both sides of the Mahmoudiyah and Beheira axis near the airport. The rainwater is collected and part of it is drained on the canal and the other part on the airport lake. In the third stage of the project, the two projects on the airport lake to exploit rainwater will be linked to the New Delta project. The rainwater will be used to irrigate the crops, vegetables, and fruits in the New Delta.





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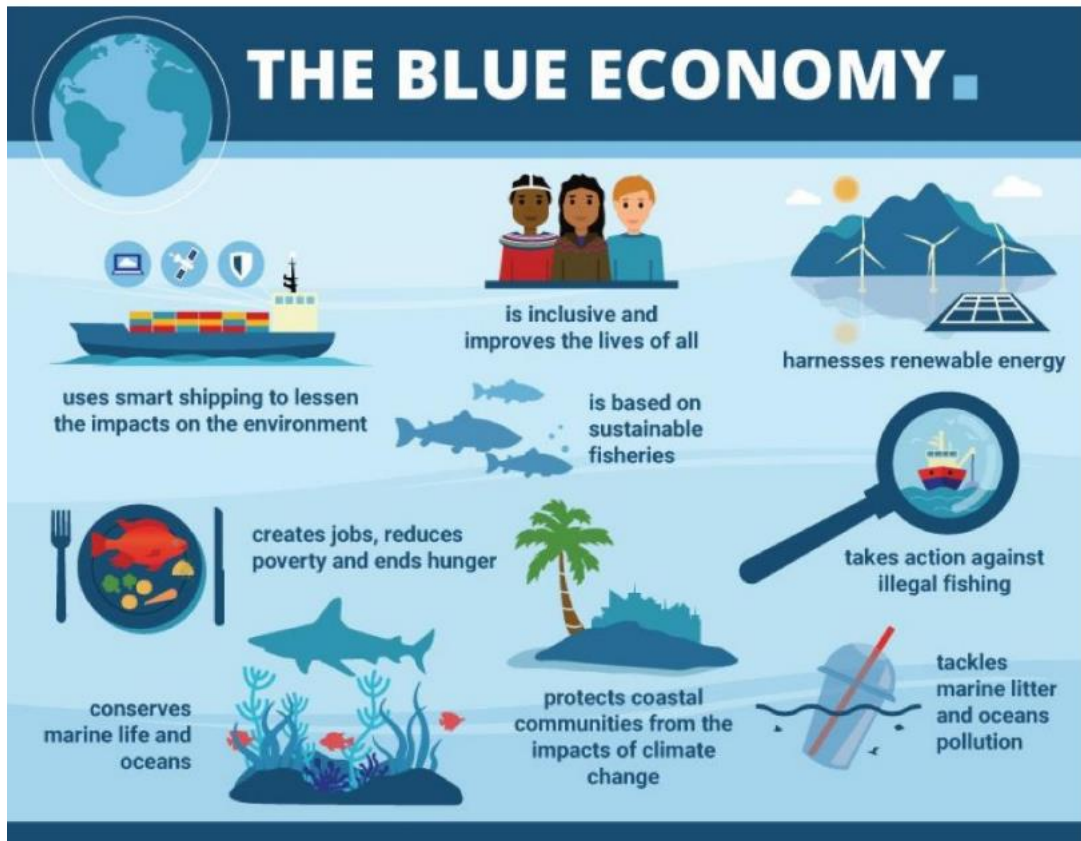
Integrated strategy project for rainwater management in Alexandria Governorate in cooperation with Alexandria University



Before performing the integrated strategy project



After performing the integrated strategy project Mahmoudiyah Axis Project before and after performing the project



ALEXANDRIA CENTER FOR A GREENER BLUE ECONOMY

Blue Economy - Definition

Sustainable use of ocean, sea and river resources for:

- o Economic growth.
- o Improved livelihoods.
- o Job creation.
- o Mitigation of the impacts of climate change.
- o Meeting the food needs of a growing global population.

Blue Economy - Challenges

- o Frequent flooding.
- o Marine pollution.
- o Lack of trained personnel.
- o Over-exhaustion of resources.
- o Lack of regional cooperation.

Vision

Towards a greener blue economy for the benefit of the citizens of all Mediterranean countries

Mission and Goals

- o Conduct studies about the challenges of merging green economy requirements into blue economy applications.
- o Offer solutions to assist in the development and sustainability of resources that comply with standards of efficiency, effectiveness and prosperity.
- o Achieve just distribution of wealth among successive generations of our region.
- o Formulate strategies to mitigate and adapt to the negative effects of climate change and reduce the emission of greenhouse gases.
- o Incorporate cultural, civilizational and social aspects within the sustainable blue economy strategies.

Decarbonization and Sustainable Development through Synergy Between Academia, Industry and the Government

An Initiative by Alexandria University

An initiative is proposed by Alexandria University to adopt a synergetic approach towards achieving decarbonization and sustainable development. The synergy is established between the three key players who are responsible for developing solutions to the climate crisis, namely, academic institutions through research, innovation and consultation; governmental bodies through policies and procedures; and industrial entities through implementation. Within this synergetic framework, Alexandria University and its academic and industrial partners introduce six multidisciplinary projects that would be integrated to efficiently allocate our resources, hence positioning Egypt as an African gate of decarbonization to Europe, while accelerating the path towards net zero for Egypt. The projects include decarbonization of the Egyptian fertilizer industry, technology transfer and localization of electric vehicle manufacturing in Egypt, reduction of global emissions through the Suez Canal expansion and the provision of low carbon bunkering, energy and water efficiency initiatives through the founding of Alexandria water and energy services company, establishment of Egypt as a world hub for electronics design and manufacturing, and finally enhancement of the Egyptian energy mix and establishing Egypt as a regional energy hub.

I. Introduction

In ancient Egypt, Alexandria, through its library, played an important role as a center of knowledge and enlightenment for the whole world. In modern Egypt, through its university, it seeks to continue this role by proposing an effective approach towards the decarbonization and sustainable development of the country.

In recent years, the climate crisis has heavily impacted the lives of millions of people across the globe through the increased frequency and intensity of extreme weather events. Global warming and rising average global temperatures are causing alarming consequences on human life and on the sustainability of our planet. As such, urgent actions are necessary to address the climate crisis through collective efforts of all mankind.

An initiative is thus proposed by Alexandria University to adopt a synergetic approach towards achieving decarbonization and sustainable development. Three key players are responsible for developing solutions to the climate crisis, namely, academic institutions through research, innovation and consultation; governmental bodies through policies and procedures; and industrial entities through

implementation. Through synergy between all three players, decarbonization and sustainable development is an attainable target.

Alexandria University is located in the city of Alexandria, the largest Egyptian port located on the Mediterranean Sea, and represents the first industrial center in Egypt which encompasses alternative industries such as the petroleum and petrochemicals industry, the fertilizer industry, the steel industry, the textile industry, and shipyard and marine engineering related industries, among others. As such, Alexandria University and the city of Alexandria are in prime position to take an essential role in positioning Egypt as an African gate of decarbonization to Europe, while accelerating the path towards net zero for Egypt through the following proposed set of six projects, integrated with an economic and anthropological approach to achieve efficient allocation of our resources in Egypt:

1. Decarbonization of the fertilizer industry through the production of green hydrogen and green ammonia.
2. Establishment of the electric vehicle (EV) manufacturing industry in Egypt.
3. Reduction of global emissions through the Suez Canal expansion and the provision of low carbon bunkering.
4. Energy and water efficiency initiatives through the founding of Alexandria water and energy services company (AWESCO).
5. Egypt as a world hub for electronics design and manufacturing.
6. Enhancement of the Egyptian energy mix and establishing Egypt as a regional energy hub.

II. Decarbonization of the Fertilizer Industry

Since the discovery of its synthesis from hydrogen and nitrogen at the beginning of the 20th century by Haber and Bosch in Germany, ammonia has had a profound impact on the global scale. Nowadays, the key role for ammonia is as the basic feedstock for the production of fertilizers that currently support food production for around half of the global population. Ammonia is also an efficient refrigerant that has been used extensively in industrial cold stores and in large-scale air-conditioning. It is also the main ingredient in the textile and pharmaceutical industries. Ammonia could also be used as a hydrogen carrier and future bunker for ships. Current global ammonia production is predominantly achieved through the steam reforming of methane to produce hydrogen to feed into ammonia synthesis. Ammonia production through this procedure is a highly energy intensive process, and along with cement, steel and ethylene production, represent the 'big four' industrial processes where a decarbonization plan must be developed and implemented to meet the net-zero carbon emissions.

As such, a consortium is being established between Alexandria University and the leading fertilizer manufacturing companies in Egypt, in which Alexandria University would provide the technical expertise necessary to develop green ammonia production plants for these companies.

III. Electric Vehicle Manufacturing

Transport is one of the major areas that contribute significantly to the amount of global carbon emissions. As more electric vehicles are manufactured and enter the local and global market, this would allow a seemingly smooth shift of energy demand from oil to electricity. Combined with decarbonization of electricity production plants, the infusion of electric vehicles into the market would result in a drastic reduction in carbon emissions.

Historically, reduction of CO2 emissions had been the main motive to move from gasoline/diesel engines into hybrid and electric transportation. The European commission estimates that greenhouse gas emissions from transportation in 2017 accounted for 25% of global greenhouse gas emissions versus 15% only in 1990. This percentage measured by the European Union is also confirmed in Egypt through the United Nations Development Program (UNDP) in Egypt which stated that in 2002/2003, the transport sector was responsible for 28 % of the final energy consumption in Egypt and for about 25 % of the energy related CO2 emissions and is the fastest growing source of CO2 emissions in the country. The total amount of greenhouse gas emissions from the transport sector in Egypt in 2002/2003 was estimated at 29 million tons of CO2. Public transportation represents a major part of transport, the UNDP project estimates the share of public transport (including buses, mini-buses, shared taxis, light rails and metro) to be around 75% of total emissions versus 25% for private cars in 2001.

As such, Alexandria University participated in an initiative with a group of academic and industrial partners, for the technology transfer and localization of electric vehicle manufacturing technology in Egypt. This is carried out through the design and manufacturing of an electric power train for a city bus. The project involves the design and manufacturing of an electric powertrain for city bus transport vehicles. The main objective of the project is to develop production-ready electronic control units (ECUs) that shape the bases of electric vehicle (EV) power train system. Specifically, the target category of electrical vehicles is the city bus transport vehicles. The project addresses the development of four ECUs, namely, the battery management system (BMS), the power train (PT), the inverter and the instrument cluster.

The project is sponsored by ITIDA – Egyptian Ministry of Communications through a 5 million Egyptian pound fund and also co-sponsored by 12 million Egyptian pounds from our industrial partner, Brightskies, a leading Egyptian company in the field of embedded software systems. It involves the design, manufacturing and testing of the battery package which includes modification of the existing brake system to support regenerative braking and involves the design of the best experience of vehicle dynamics, especially stability over curves, while adapting the suspension system to the new vehicle dynamics model. The developed powertrain will be demonstrated by converting a 12m bus (6-7 years old) into a fully electric bus.

IV. Suez Canal Impact

Egypt has a distinctive geographical location, which is highly accessible by three continents; Europe, Africa and Asia. Bordered by the Mediterranean and the Red Sea, Egypt is primed as a central hub for different trade routes. Egypt has historically contributed with many projects that led to a faster and more economical path for connecting the corners of the world, which directly contributed to the boosting of the world economy. Such transport projects include the Suez Canal (SC) and SUMED oil transport pipeline.

Recently, Egypt is contributing through the Suez Canal Economic Zone (SCZ) to support the global supply chains and green ship bunkering. These faster and highly economical routes always had a great impact on the reduction of the fuel consumed and consequently the reduction in emissions which became lately the world's main point of concern.

During 2019, 18,880 vessels passed via SC with a total deadweight of about 1billion tons, which represents about 10% of the world's global trade. The distance saved reached about 10,000 nautical

miles (18,000 Km) on certain voyages which contributes to immense fuel and emission savings, in addition to the contribution to the global economy.

Currently, Egypt is establishing the Suez Canal Economic Zone (SCZ) with the aim of providing bunkering facilities on this main shipping route which is expected to include different types of low emission and green fuels. In addition to the added reduction in emissions, another contribution involves simplifying world supply chains and creating new hubs directly on the main shipping routes.

SUMED is a crude oil pipeline established in 1974 connecting the Gulf of Suez and the Mediterranean sea. This project has an added contribution in reducing the shipping required for oil and consequently the amount of emissions involved. A detailed analysis is currently being carried out to highlight the role and impact of the SC, SCZ and SUMED to the reduction of CO2 emission globally and discusses how the tolls scheme could be used by SCA to provide incentives for the use of clean bunkering in the shipping industry. The objectives of this analysis is to measure the impact of the Suez Canal in the shift towards carbon clean maritime supply chains, and to provide investment plan to the SC to become carbon neutral by investing in hybrid tugboats and applying ISO 14001 & ISO 50001. Academic partners in this project include the Arab Academy for Science, Technology & Maritime Transport.

V. Alexandria Water and Energy Services Company (AWESCO)

There has been an increased interest in recent years in providing energy services for the purpose of achieving energy and environmental related goals. In particular, specialized companies providing energy services to final energy users, including the supply and installation of energy efficient equipment, and/or building refurbishment, have started to operate on the international market.

Alexandria University is planning to establish a water and energy services company (AWESCO) to operate in the fields of energy and water resources. Potential shareholders shall be Alexandria University and a financing institute. AWESCO vision is to:

- Transform Egypt's built environment and industry to a leading example of energy efficiency.
- Help Alexandria to be a green and sustainable city.
- Lower the carbon footprint of the region.
- Introduce and implement the concept of energy performance contracting.

AWESCO will provide services for the fields of construction, industry, transportation, agriculture, and entrepreneurship. For the field of construction, the following services will be provided:

- Energy auditing of existing buildings as well as proposed construction.
- Propose sustainable building retrofitting techniques that help optimize building energy consumption.
- Propose appropriate renewable energy systems.
- Propose water efficiency measures.
- Provide complete solutions including procurement and project management.

- Provide energy performance contracts to act as a third party between lending and financing agencies and building owners in order to fund proposed building energy retrofitting with guaranteed payback time.
- Amend national building codes and standards to improve energy efficiency.

Services for the industry would include:

- Provide energy auditing for the building envelope as well as the industrial process.
- Propose solutions for optimization of energy use.
- Perform research and development for common industry energy optimization problems through funding of research in Alexandria University.

Services in the field of transportation would include performing studies and research for enhancement of green transportation, while services provided by AWESCO in the field of agriculture would include water efficiency in irrigation systems and energy efficiency in agricultural machinery. Target funding agencies include international funding agencies and the Egyptian banking sector.

VI. Egypt as a World Hub for the Electronics Design and Manufacturing

Egypt is making significant steps towards transforming its economy into a knowledge economy based on innovation. In this context, Egypt has launched a Presidential Initiative entitled “Egypt Makes Electronics (EME)” to capitalize on the growth of this nascent industry in Egypt during the last two decades and to capture a huge opportunity that is presenting itself on the international scene. The objective of EME is to transform Egypt into a world hub for electronics design and manufacturing and to attract significant foreign direct investment (FDI) in this field.

Egypt has intrinsic advantages that play in the favor of attracting FDI in electronics design and manufacturing such as the abundance of talent and its strategic geographic location. However, several important drivers and dynamics may prove highly valuable in enabling Egypt to position itself as a world hub for this industry. Indeed, the world is moving from a globalization model that has prevailed for decades to a model where manufacturing is more regional and distributed. Many players are starting to establish regional manufacturing facilities in contrast to depending on the Far East and specifically China as the world’s major manufacturer of electronics. This is driven by geopolitical reasons as well as securing supply chain and avoiding its disruption. In addition, one important reason to move manufacturing facilities to regions closer to big markets is to minimize the cost of transportation and its negative impact on the environment. On the design side, many global players are looking for talent around the world to augment their resources and their ability to develop and produce new products in time. Such global companies will establish Offshore Design Centers (ODCs) wherever they find critical mass of talent that they can tap into.

The objective of this initiative is to establish a technology park for electronics manufacturing and design. The project has two pillars; the first is to establish a hub for Electronics Manufacturing Services (EMS). This can be spearheaded by one mega company through a Joint Venture between one of the

local Egyptian players with track record in electronics manufacturing and a global EMS player. The other pillar is to establish a cluster of ODCs serving European and international players in the semiconductor and electronics industries. The objective of the initiative is to have a significant positive impact on the Egyptian economy and to boost exports and creation of high value jobs.

Alexandria University is positioned to be the academic leader of this project due to its expertise and resources and the large number of qualified graduates that can fuel both parts of the projects, manufacturing, and design. Potential industrial partners are currently being assessed who can spearhead the establishment of a major EMS provider in partnership with a global player.

VII. Egyptian Energy Mix and Egypt as a Regional Energy Hub

The present initiative aims at establishing Egypt as an energy hub for gas and other sources of energy. Moreover, and in the meantime, Egypt should also ensure a sustainable balanced portfolio of alternative energy sources (oil, gas, solar, wind, hydro, and nuclear). Although renewable energy sources provide environmental advantages, they cannot fully replace fossil fuel use. They also offer challenges of their own. As such, we can see that short-term replacement of oil and gas is not possible. And with the growing energy needs of rising population, urbanization, and increased standard of living; investment in all sources of energy should be sought. Investment into reducing the harmful emissions from fossil fuels to make them cleaner should be also increased. The two large-scale feasible solutions (at least technically) available to mankind to reduce CO₂ and harmful gases emissions are: (1) Forestation or planting trees (which require significant fresh water resources) and (2) Carbon Capture and Storage (CCS) in underground reservoirs. Improving the efficiency of all systems that use energy should also be sought. Efficiency of existing systems that consume high energy (regardless of the source of energy) can be increased by a combination of technological solutions, improvement of building codes and implementation of regulations and effective audits.

Operations and projects related to environmental impact at the republic level and linked to community service through Alexandria University

	Name of entity	type of operation
1	Northern Military Region	Preparing designs and supervising the implementation of (13) wells in the Wadi El-Natroun Center - Beheira Governorate, within the scope of the Presidential Initiative, Hayat Karima.
2	The General Administration for Horizontal Expansion Projects in the West Delta - Damanhour.	Permanent supervision of the rehabilitation and lining project of the Farhash Canal Branch. The reins of the General Administration for Nubariya Irrigation - Beheira.
3	General Administration of Irrigation and West Beheira	Inspection of Al-Hamrawiya Canal and Al-Rizq Canal - under the leadership of irrigation engineering - Kom Hamada Center
4	General Administration of Irrigation and West Beheira	Inspection of Abia Canal - Lead Irrigation Engineering - Kom Hamada Center
5	General Administration of Irrigation and West Beheira	Inspection of Fahmy Canal 1, 2 - and Amlak 3 in Nubaria
6	General Administration of Irrigation and West Beheira	Preparing a specialized technical study to study the efficiency of lining work for some canals in the governorate
7	Liwa Al-Hamad Contracting Company	Counter study of the cracks that occurred in Tintin, Mashaala Canal - affiliated with the General Administration of Irrigation and Western Sharqia
8	M / Marsa Al-Zaftawi - Contractor	Preparing a special report on the inspection and lining of the Mandarin Canal
9	Liwa Al-Hamad Contracting Company	Preparing a study of the cracks that occurred in Tintin Tera (Menzil Maimoun and Ouled Musa)
10	Al-Helm Contracting Company	Rehabilitation and lining project for Bermbal Bay canal from 3.470 km to the end - West Kafr El-Sheikh irrigation road
11	The Productive Cooperative Society for Architectural Works - Buhaira	A project to rehabilitate and line the Al-Dahri Al-Sharqi Canal, from the mouth to the end, with a length of 9,060 km. And the Qamish Canal, from the mouth to 3,560 km, with a length of 3,560 km. I - Al-Buhaira
12	Helwan Diesel Engines Company	Rehabilitation project of the New Wakala Canal, Amin Sayed Ahmed, the New Wakala feeder, the New Wakala feeder canal.
13	General Manager of Horizontal Expansion and Projects in West Delta	A project to rehabilitate and line the "Khorshid" canal, which is affiliated with the Sand Irrigation Engineering Department, under the General Administration of Lake Irrigation.

14	Central Administration of Water Resources and Irrigation in Alexandria Governorate	Preparing designs and tender documents for a rehabilitation project of 4 canals, "Abdul Qader Canal, Kafr El-Waq Canal, New Zawya Saqr Canal, and Zawya Salem Canal" affiliated with the General Administration of Irrigation in Noubaria - Alexandria.
15	General Administration of Irrigation and West Beheira	Preparing the required study on the Line of Fire and Al-Ahkar Canal
16	General Administration for Horizontal Expansion Projects in the West Delta - Damanhour	Preparing the required study on the Ansariyah link canal
17	Irrigation Department in the West of the Lake, General Administration of Water Resources and Irrigation in the Lake	Preparing the required study for 5 canals (Jarar Maanya Canal, Waslat Al-Afandiyya Canal, New Shesht Canal, and Al-Azima Canal from the mouth to the end)
18	General Administration for Horizontal Expansion Projects in the West Delta - Damanhour	Preparing a study on the causes of the bridges of the Shaker Canal under the control of the General Administration of Irrigation West of the Lake - Shoubrakhitt Irrigation Engineering
19	General Administration for Horizontal Expansion Projects in the West Delta - Damanhour	Preparing a hydraulic study for the rehabilitation and lining work of the Jezizah Al-Jamaa Canal in the General Administration of Lake Irrigation.
20	Al-Reef Al-Masry Company wells project - Al-Mughra area	The contract was concluded between Alexandria University - Faculty of Engineering - Engineering Center and the Egyptian Countryside Company
21	United Housing and Development Company	Preparing an environmental impact assessment study for plot No. 31 in the second group of the division from residential to service for the Ministry of Electricity and Energy
22	Alexandria International Container Terminals Company	Preparing an electrical study for the Alexandria International Container Terminals Company located in the ports of Dekheila and Alexandria.
23	Egyptian Electricity Transmission Company	Conducting a study of the effect of the magnetic field of the overhead line for the electrical connection between the Arab Republic of Egypt and the Kingdom of Saudi Arabia on the oil and gas pipeline.
24	Alexandria Governorate and the Sanitation Company	Integrated strategy project for rainwater management in Alexandria Governorate
25	The legal representative of the American Kalimat Al-Hayat International Private School	Preparing an environmental impact report for the American International Private School of Life, located in Part 5, Hosha 4, Lake Mariout Basin, No. 8, 10th Abis - Central District - Alexandria.

26	The legal representative of the British Kalimat Al-Hayat International Private School	Preparing an environmental impact report for the British Kalimat Al-Hayat International Private School, located in Part 5, Housha 4, Lake Mariout Basin, No. 8, 10th Abis - Central District - Alexandria.
27	The legal representative of Nawah Academy School	Preparing an environmental report for the Nawah Academy School located in Part 5, Housh 6, Street No. 8 - Abis Al-Ashra, Central District - Alexandria Governorate.
28	Al-Tahir Modern Real Estate Investment Company	Preparing an environmental impact assessment study for the plot of land allocated to the company - located in the Sidi Abdel Rahman Kebili district of the coastal road, with an area of 27,706 square meters, equivalent to (6.5) acres.
29	Al-Tahir Modern Real Estate Investment Company	Preparing an environmental impact assessment study for the plot of land allocated to the company - located in the Sidi Abdel Rahman Bahri district, the coastal road, with an area of 19,083 square meters, equivalent to (4.5) acres.
30	Mr. Major General Ayman Abdel Haq Al-Samalawy, the legal representative of Najm International School	Preparing an environmental report for Brilliance Virginia International School.
31	Mr. Hani Mustafa El-Sayed El-Arabi, the legal representative of Alpha International School	Preparing an environmental report for Alpha International School
32	Mr. Mohamed Abdel Fattah Hassan - Owner of Al Qabas International School	Preparing an environmental report for Al-Qabas International School, which is located in Plot No. 633 of 88 original extensions of Ascot Street, approved with a width of 15 metres, and an extension of an approved street with a width of 10 metres, Al-Mansheya El Bahariya - Alexandria.
33	Union of occupiers of the village of Costa del Sol	Preparing an environmental impact assessment study for the village of Costa del Sol - North Coast K 82 - Alexandria Matrouh Road
34	Mr. Nabil Fawzi Hanna Makar - Owner of New Oxford International School	Preparing an environmental report for New Oxford International School, located in Plot No. 1, 2, Basin 63, Lake Mariout Basin - Central District - Alexandria.

The funded research projects at Alexandria University on climate action, running from year 2019-2024

Research Projects 2019-2024					
	Project Title	Start Year	End Year	Funding Authorities	SDGs
1	An integrated system for sustainable water management in agricultur	2019	2022	European Union	Climate Action
2	Innovative Sustainable Solutions for broomrapes: Prevention and integrated Pest... management approaches to overcome parasitism in Mediterranean cropping Systems	2019	2023	European Union	Climate Action
3	Agro-ecological genomics and molecular systematics of invasive drosophilid pests and frugivorous insects in Egypt	2019	2021	European Union	Climate Action
4	An Innovative method for producing ultra- high elastic piezoelectric nanofibrous layers using solution-blowing technique	2019	2021	National	Climate Action
5	Milk and meat safety and greenhouse ags emissions from ruminants fed on organo modified nanoclays as feed additives	2020	2023	National	Climate Action
6	Ethyl Formate as Alternative to Methyl Bromide for Controlling storehouse pests on Dates	2020	2023	National	Climate Action
7	Increasing the main active substances in the Wonka plant using CRISPR/Cas9 technology	2020	2023	National	Climate Action
8	Towards Breeding of Promising Hybrids and Cultivars of some Strategic Vegetables Crops	2020	2023	National	Climate Action
9	Development of an Irrigation Management Information and Communication System (IMICS) for the humid tropical region of Kerala and for the dry climate of Egypt as a decision support systems (DSS) tool to improve crop productivity.	2020	2022	National	Climate Action
10	New Professional Diploma in Plant Clinic and Phytosanitary Technologies	2020	2023	European Union	Climate Action
11	Developing a smart irrigation system to evaluate and monitor the quality of the green area and maximize the use of available water resources	2021	2021	National	Climate Action
12	Design and implementation of a self- propelled unit for landscaping maintenance (mowing and aeration)	2021	2021	National	Climate Action

13	PiezoACT membranes : Piezo-Active Nanofibrous Self- decontamination Facemasks/ Filters using Solution Blow Spinning in Egypt	2022	2023	European Union	Climate Action
14	Documentation of Wild Egyptian Flora using DNA- Barcoding Technology	2022	2024	National	Climate Action
15	Accelerating the Impacts of Solar Driven MOF Adsorption System for Water Desalination and Cooling in Egypt	2022	2024	European Union	Climate Action
16	The second part of the Egyptian Wild Plant Encyclopedia	2022	2024	National	Climate Action
17	Downscaling atmospheric components over Egypt under different future climate change scenarios (2065-2100)	2022	2024	National	Climate Action
18	Preparation of NP-nucleic acid insecticides and its application in pest control	2023	2025	National	Climate Action
19	Universities resilient to climate change: Public awareness, sustainable education and technology development as principal strategies towards net Zero Carbon Campus	2023	2024	European Union	Climate Action
20	Microbial-augmented biochar to control soil-borne plant diseases and mitigate climate change	2023	2023	National	Climate Action
21	Agronomic characterization and genetic diversity of Quinoa genotypes under heat and drought stresses in North-West Egypt	2023	2025	National	Climate Action
22	Effect of some bio fertilizers, vermi compost and Salicylic acid on citrus rootstock salinity tolerance	2023	2025	National	Climate Action
23	Preparation of prototype of Saccharomyces bentonite composite as a cerevisiae nano novel feed supplement to mitigate enteric gases greenhouse	2023	2025	National	Climate Action
24	The prospective ameliorative effect of zinc and melatonin against oxide nanoparticles cadmium oxide nanoparticles-induced integrated biomarker-based toxicity: an approach for ecotoxicological evaluation in a model organism Blaps polycresta	2023	2026	National	Climate Action
25	Boosting Second Harmonic Generation in Integrated Photonic Platforms	2024	2026	Alexandria University initiative to support research RSI 2	Climate Action