ISLAMIC UNIVERSITY OF LEBANON

REPORT ON SDG 17

PARTNERSHIP FOR THE GOAL

15 LIFE ON LAND

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SDG 17 - PARTNERSHIP FOR THE GOAL

INTRODUCTION

The Sustainable Development Goals, SDGs, represent basic principles to end poverty, protect the planet and ensure that all people enjoy peace and prosperity. They were gestated at the United Nations Conference on Sustainable Development, held in Rio de Janeiro in 2012, replacing the Millennium Development Goals (MDG, 2000), to create a set of global goals related to environmental, political and political challenges. economic conditions that our world faces. They were launched in January 2016 and will guide the policies and funding of the United Nations Development Program (UNDP) for the next 15 years.

The United Nations Development Program works with governments to integrate the SDGs into their national development plans and policies, and this in turn has led to the need to implement a new agenda to promote Sustainable Development, Agenda 2030. Agenda 2030, is a new tool for sustainable development, which aims to end poverty, promote prosperity and well-being for all people, in addition to protecting the environment by 2030.

More and more institutions are auditing their situation with respect to the SDGs to lay the foundations of the new agenda, Agenda 2030. Those most committed and more aware of this international need will be the best positioned to carry out necessary improvements in the current management model and infrastructures with technical and financial assistance from the United Nations Development Program.

Within these institutions are the universities, where the relationship between the SDGs and the universities can be seen as mutually beneficial and necessary for both parties. On the one hand, anticipating offering training on the SDGs is a way of demonstrating the institution's ability to adapt to these changing circumstances, and on the other, funding entities and sponsors are allocating more and more aid to meeting the Goals.

Sustainable Development Goal 17 "Partnerships for the goals" refers to the need for cross-sector and cross -country collaboration in pursuit of all the goals by the year 2030. SDG 17 is a vision for improved and more equitable trade, as well as coordinated investment initiatives to promote sustainable development across borders. It is about strengthening and streamlining cooperation between nation-states, both developed and developing, using the SDGs as a shared framework and a shared vision for defining that collaborative way forward.

At the Islamic University of Lebanon, we have a strong belief that in order for our country to develop sustainably, we have to abide by and follow these SDGs where people will enjoy a better life as well as a higher standard of living. The Islamic University has already implemented many of the requirements of the SDGs and is much willing and able to implement the remaining and incorporate it in its programs and policies.

At the end, it is extremely important to note that we need as human beings living on earth to live happily and with dignity by partnering together. All of us have to have the ultimate respect and appreciation of each other's rights; the human right. However, to be able to enjoy that and develop our lives, many elements have to be taken with great consideration. We need as humans living on this planet to care for each other by providing assistance to the less fortunate ones. And what could be better to assist than a collaborative and joint effort among all countries under the United Nations umbrella. This is the reason behind the SDGs: Sustainable Development Goals.

We, countries of the world, need to assist in preventing hunger, stressing the importance of sustainable and drinkable water, being ready to face climate change, protecting life under water and on land, respecting the order of law, treating each other equally and without discrimination, continuously and relentlessly working on looking out for other sources of affordable and clean energy, sustaining city life without having to continuously run away to the suburbs, preserving justice among us all through a good and fair judicial system, consuming and producing responsibly, stressing innovation and creativity, promoting decent jobs and good work environments without any human trafficking or child labor or money laundering, promoting good health and well-being, making education affordable and reflective of the job market demand and assuring each other of zero tolerance for hunger.

When all of these are implemented then the world will be a much better place to live. The quality as well as the standard of living of people will be better leading to a decrease in the gap between the rich and the poor. There will be more respect for the human rights, lesser crime and extremism and finally peace will prevail.

SDG 15 – LIFE ON LAND

Our lives as human beings depend on the earth as much as it depends on the ocean for our existence. Forests and woods throughout earth cover about one third of the land's surface. These forests provide crucial habitats for many species and are an important source for clean water and air, and are crucial for combating the changes in the climate. The many forms of life need to be preserved on land and this will require joint efforts in order to protect, promote and restore and conserve the sustainable use of terrestrial and all other ecosystems. SDG 15 focuses in particular on the well managing of forests in a sustainable manner, stopping and reversing the degradation of land and the natural habitat, halting successfully the desertification and loss in biodiversity. All these efforts combined aim to ensure that the benefits of land-based ecosystems, including sustainable livelihoods, will be enjoyed for generations to come. Our livelihood is greatly influenced by our surroundings. That it is why it is believed that if you take good care of you mother land then it will take good care of you. An example of what truly humans are doing terribly to wooded areas is McDonalds. McDonald is big in cutting trees in the Amazon area to create farms for its cattle. The idea is to maximize the corporation's stock price and make its shareholders happy at the expense of future generations.

It is indeed a serious problem if we exhaust the current resources on land for our own individual self-interest and not caring about the future generation quality of life.

This is why the whole world has come together to tackle this serious issue that affects us now and our children at a later point in time.

IUL and life on land:

A flourishing life on land is the foundation for our life on this planet.

At the Islamic University of Lebanon, the sustainable farming and planting approach is based on a mixture of scientific evidence and Islamic values. The scientific reality is that plants are the main pillar of life on the globe, and plants are needed for all other living things. The place and land on which the IUL campus was built is one of its key steps towards promoting the land ecosystem.

This campus is located at Werdnnayeh, a village in Mount Lebanon governorate. Around 50% of the campus' area is covered by green areas. The cultivated areas are distributed between areas devoted to fruit trees and the others are used to cultivate vegetables where IUL provides farmers with this designated area for the sake of using it to plant different forms of vegetables.

They include many types of fruit trees, such as sate, olive, pin, pomegranate, banana and guava trees. Whereas " Thru," "Kenny, "Acacia" and "Lelandi" are for the leafy trees, with a rapid plan to implant 100 "eljamila" trees in the western fence of the campus that the IUL has raised in tanks. In all the campus areas and large grass areas, several varieties of flowers and some grass areas are cultivated. The total green area (A_G) distributed between the area of forests, grass and plants is equal to 13145.24 m2, while the total area of the IUL wardanyeh campus (A_C) is equal to 158413.9 m2.

The IUL campus showing the abundance of trees, and other vegetation areas that are the areas allocated by Greenhouses where a large number of vegetable spices are being planted.

Figure 1. IUL campus

The following Figure shows the total campus area of Wardanieh campus which is about 158413.9 m2.

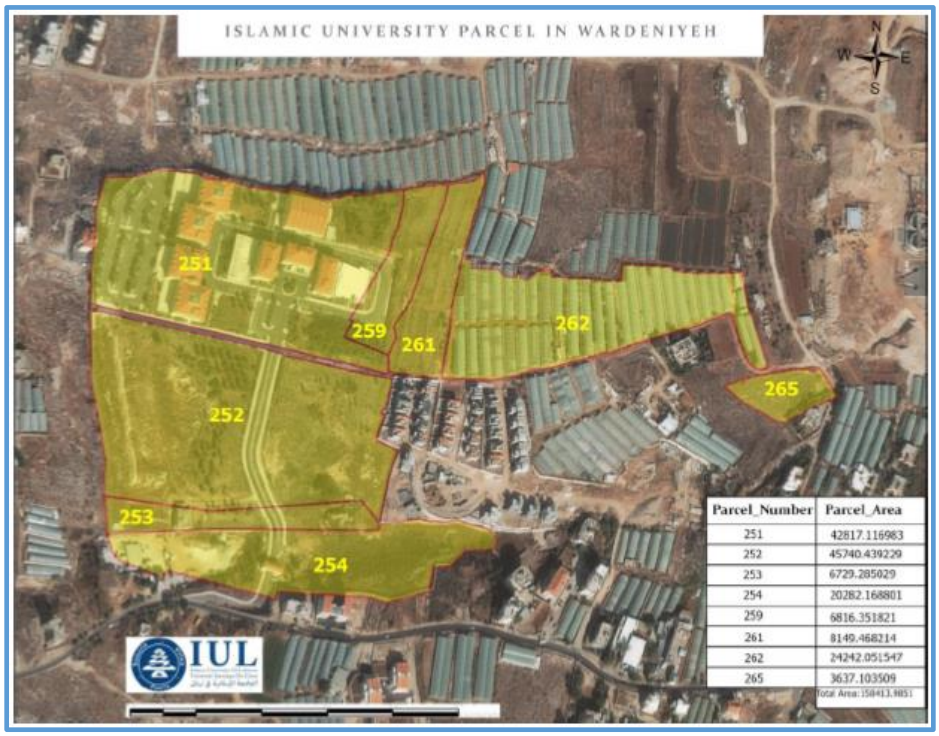

Figure 2. Total Campus Area

The total area of the campus covered by trees (forest) ***AT*** is about 76526.5 m2.

Figure 3. Total area on campus covered in forest

Therefore, the percentage (P_{TC}) of total area covered by trees (A_T) to the total campus area (A_C) can be calculated using the below equation as:

$$P_{TC} = \frac{A_T}{A_C} = \frac{76526.5}{158413.9} * 100 = 48.3\%$$

A large number of these trees are fruit trees of several types as date, olive, pin, pomegranate, banana and guava trees.

Another part of the green areas is dedicated for vegetables in parcel 265 with an area of 3637.1 m2. Another part which is dedicated for implantation using green houses in parcel 262 and has an area of 24242 m2. Thus the total area for vegetation equals 27879.1 m2

Figure 4. Total area for vegetation

Therefore, the percentage $\boldsymbol{P_{VC}}$ of total area for vegetation ($\boldsymbol{A_V}$) to the total campus area ($\boldsymbol{A_C}$) can be calculated using the below equation as:

$$P_{VC} = \frac{A_V}{A_C} = \frac{27879.1}{158413.9} * 100 = 17.6\%$$

It is located at the east of the IUL conference palace of IUL. This allocated area is provided to the farmers by the IUL for the sake of using it for planting their species. Various types of vegetables are farmed as tomato, cucumber, capsicum, and aborigine. Then, with aim of supporting these vegetable framing, the IUL buys these vegetables from the farmers to be cooked at the IUL's cafeteria.

15 LIFE ON LAND

The IUL has the policy to reduce the depletion of the resources of natural ecosystems and biodiversity, and to encourage global food and water protection, mitigation and adaptation to climate change, and preventing pollution.

One of its primary steps toward supporting the land ecosystem is the choice of the location and land on which the IUL campus was built. The chosen location was Wardaniyeh which is a town in the Mount-Lebanon region about 31 km away from the country's capital Beirut. The reason behind is choice is that it is an unindustrialized and sparsely populated area and classified as an agricultural area far away from the pollution of the cities.

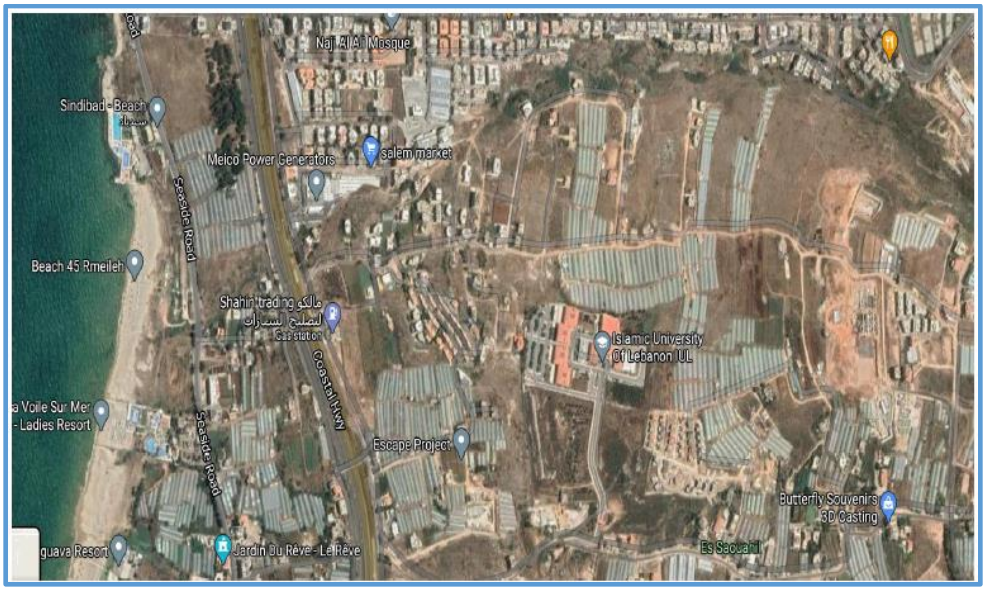

Figure 5. Wardaniyeh campus

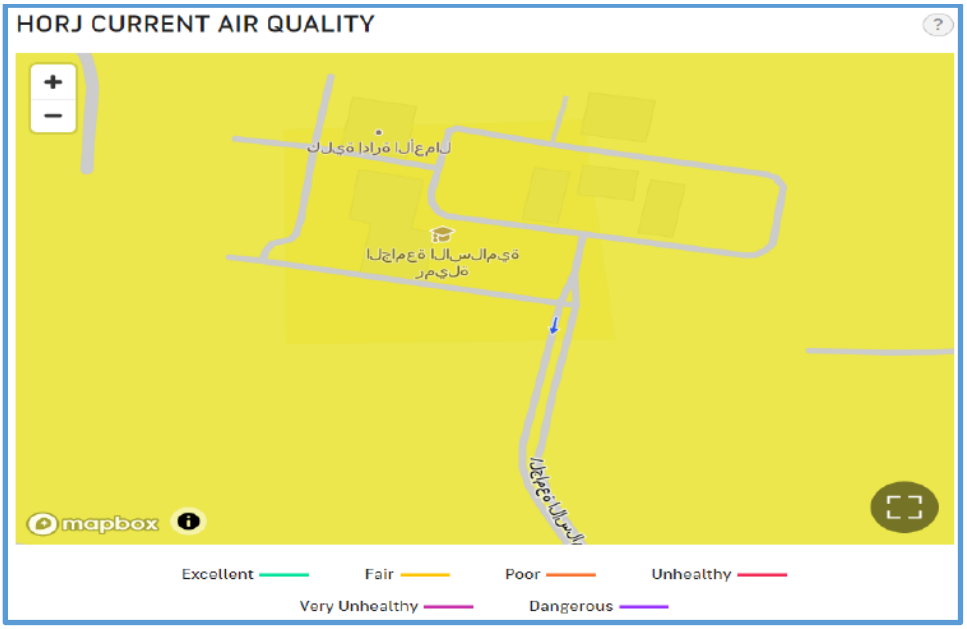

Figure 6. Wardaniyeh campus

15 LIFE ON LAND

For serving this policy, the IUL encourages and helps in maintaining, developing and protecting forests, farmlands and gardens to improve the air quality, biodiversity of plants and fruits and the nature beauty. Moreover, it takes into account all the necessary measures to prevent air pollution. Also, it beliefs that the animals are holly creatures and we have to take care of them by unarming them and helping them to survive and increase.

On the level of air pollution

Firstly, smoking is strictly prevented in all the indoor and outdoor areas of the IUL campus. Secondly, for preventing any air pollution that could be caused by the electric power generators utilized for the supplying the campus by electricity, IUL has constructed large water tanks for this aim. Where the water filled in these tanks makes filtering for the smoke caused by the electric generators, therefore the smoke is passed through these tanks firstly instead of directly to the air. These tanks are cleaned periodically and their water is changed.

On the level of animals' biodiversity

On this level, the IUL raises chicken and bees. It has constructed special houses for these species. A large chicken coop is constructed for chicken to keep safe and secure. There are nest boxes found inside these hen house for egg-laying, and perches on which the female chicken can sleep.

Figure 7. Animals' biodiversity

A number of hives for the bees' colonies:

Figure 8. Hives for the bees' colonies

It tries to save the animal treasure found in nature and exist within the campus of IUL such as birds, pigeons, cats, dogs, and prohibits killing or hurting them even the wild ones. Additionally, hunting birds is strictly prohibited within and around the campus. Furthermore, the birds and animals are fed by the food leftovers of the IUL cafeteria. IUL is currently working on constructing wooden houses for the birds and pigeons to have a worm and safe shelter on its trees.

Figure 9.Wooden houses for the birds and pigeons

On the level of green biodiversity:

Form the IUL total area, a great portion is dedicated to forests implantation and vegetation. Concerning the forest, the IUL has about 2300 implanted trees of several types that reflect their biodiversity. These trees are of both categories: Leafy and fruit trees.

Concerning the fruit trees, they include several types as sate, olive, pin, pomegranate, banana and guava trees.

Figure 10. Forests implantation and vegetation

Whereas, for the leafy trees they are "Thru", "Kenny, "Acacia" and "Lelandi", with a soon plan of implanting 100 "eljamila" trees in the west fence the campus that the IUL have been raising them in tanks.

Figure 11. The leafy trees

Several types of flowers and some areas of grass are planted through all the campus zones and large areas of grass.

Figure 12. Types of flowers and grass

The figures and calculation below show the percentage of these green areas with respect to the IUL total area.

The total green area (A_G) distributed among forests (tree) area, grass and vegetation areas is equal to 13145.24 m2, whereas the total area of the IUL Wardanyeh campus (A_C)= = 158413.9 m2.

Therefore, the percentage P_{GC} of total green area (A_G) to the total campus area (A_C) can be calculated using the below equation as:

$$P_{GC} = \frac{A_G}{A_C} = \frac{103578}{158413.9} * 100 = 82.9\%$$

This percentage reveals that the green areas constitute an enormous part of the IUL campus. These green areas are irrigated continuously for the sake of their survival using drip irrigation and stream-rotator sprinkler technologies. They are defended against pest invasions by being periodically treated with pesticides that obey the FAO standards.

Figure 13. Green areas of the IUL campus

In addition to expanding the green areas outside its buildings, IUL have implanted green areas inside each of its buildings which also enhances the air quality within these buildings.

Figure 14. Indoor planted green areas improve air quality

Many courses are taught in various faculties to serve the environment sustainably objectives as: environment for engineers, construction and urbanism laws, sustainable tourism planning, Citizenship and civic Engagement.

Additionally, the university provides all the scientific and logistical facilities and capabilities such as its halls and all their equipments in the service of this goal, such us hosting seminar and lectures for the societies to that take care of the environment and birds breeding.

From them, the IUL hosted an event for an association that took care of the Canary birds, where the association conducted a competition for the Arab countries in the Middle East.

The campus water, however, is not enough to satisfy all of the water needs of the IUL for drinking, irrigation and other purposes. Therefore, to address this water shortage, IUL has built on-campus artesian wells, especially in the summer season. The consistency of this water has been tested and confirmed to be safe for use with ultraviolet radiation treatment at a rate of 1ppm.

The IUL mains source of water is supplied by the Ministry of Energy and Water which satisfies the water quality standards according to the official website of this ministry.

However, this water is not sufficient to serve all the IUL's water needs for drinking, irrigations, and other purposes. Therefore, IUL has developed on-campus artesian wells to cover this water shortage, especially in the summer season. The quality of this water has been tested and it was verified that it is suitable for use with treatment at a rate of 1ppm using ultraviolet radiation.

Drainage system

Each of the IUL buildings are equipped with separate bathrooms for men and women, as well as equipped with washbasins and the necessary cleaning materials for each wash. Then, the wastewater from the bathrooms is collected by pipes to the sedimentation and treatment basins located at the borders of the campus. After the sedimentation stage, the wastewater is discharged into the public piping network of the Ministry of Works. As for the waste in sedimentation basins, it is transported periodically throughout the year for treatment outside the compound.

Treatment of wastewater and rain water

The Rain water from roofs and balconies is collected in 11 underground tanks distributed throughout the campus, which work as sedimentation ponds as well. Figure 4.2 shows the location of the 11 tanks (named R1 to R4 and S1 to S7). The volume of these tanks is about 4,987 cubic meters. In Figure 2, each area is highlighted by a color related to the tank that collects rainwater of this area. The collected water is used as follows: 80% for irrigation and 20% for service.

Then the water is drawn from these underground into the main upper tank, and from it is drawn into the upper tanks of all buildings after being treated with ultraviolet radiation. The ratio of treated water use to the total amount of water reaches 80%.

Similarly, for the rain water on the roads, where the campus is equipped with ground tanks with a water collection system for the water from the roads. The rainwater that is produced from the roads

and landscapes is then used in the permanent drip irrigation system to irrigate the trees and plantings inside the campus, especially during the summer days.

Figure 15. Tanks to collect rainwater

Figure 16. Tanks and Area for collecting rainwater

IUL has implanted green areas within each of its buildings in addition to extending the green areas outside its buildings, which also increases the air quality inside these buildings. Those areas are irrigated continuously and periodically treated with pesticides which comply with the FAO standards, they are defended against pest invasions. The university also believes that the animals are weak creatures which should be well treated. IUL is also interested in poultry-raising.

IUL is taking two important measures to enhance air quality. First, the prevention of smoking (in both the indoor and outdoor areas of the IUL campus, smoking is strictly prevented). Second, the

filtration of smoke caused by the electric power generators used to supply the campus with electricity.

The campus architecture fits in perfectly with natural features such as parks, effective irrigation, and energy-saving shade, protecting trees, streams and soils. Rainwater is treated by natural drainage and gathered for agriculture and utility use in underground tanks. Besides the large planted areas, the relatively small developed areas minimize impermeable surfaces. According to the official website of the Ministry, the IUL 's main source of water is provided by the Ministry of Energy and Water, which complies with water quality requirements.

The locations of the buildings were directed in relation to the north and south points. It is the appropriate direction according to the location of Lebanon. Where the sun rises from the east and sets to the west, passing through the south. This will provide natural lighting starting at 7 am and throughout the year. The square shape of the educational buildings with a courtyard in the middle, and wide glass windows in the east and the west walls, provides ideal natural daytime lighting for the entire building.

The planning of development process includes four axes: site design, indoor air quality, energy savings, and water.

Site design:

- The campus design works with natural features, protecting trees, streams and soils such as gardens, efficient drainage, and energy-saving shade. Most of the buildings are connected to sun and wind to achieve significant energy. Buildings E1-E2 (Faculty of Engineering) and Buildings B and S (Faculty of Business and Faculty of Sciences) are connected via an underground path (buildings 3 and 2).
- The buildings were brought together to reduce impacts, and to provide more green space for the community.

Figure 17. Campus design showing the buildings distribution

- The design of each building facilitates the ventilation and the natural light.

Figure 18. Natural light is facilitated through the glass courtyard

- IUL works on increasing green area inside and outside of the buildings.

Figure 19. Indoor planted green areas improve air quality

- Buildings were oriented to take advantage of the dominant angles of the sun and the wind.

- Rainwater was managed by natural drainage and gathered into underground tanks for agriculture and service usage. The relatively small built areas beside the wide planted areas reduce impermeable surfaces.
- Landscaping for sustainability: the university planned to plant more trees and to reduce the grass areas correspondingly. The planted trees are selected carefully to reduce watering and maintenance needs.

Indoor Air Quality:

- The buildings design has taken into consideration giving all offices and classrooms direct access to fresh and clean air coming from the windows. The campus location helps keeping the air cool and fresh, it is located on a hill facing the Mediterranean Sea (around 1 km away) at an altitude up to 100m. It is also located on a place that is away from sources of exhaust and moisture.
- Direct ventilation is available for heating equipment, furnaces and bathrooms.
- The university has implemented a no-smoking policy and use entrance mats that remove dirt from shoes.

Water:

- Efficient irrigation equipment and landscaping techniques were used outdoor to minimize water use.
- Rainwater is taken advantage in irrigation.
- Dual flush toilets were used to preserve water.
- Most planted trees are drought-resistant and supplement sols to improve water retention.
- Drip irrigation and stream-rotator spray are the techniques used for irrigation.

In collaboration with farmers, agricultural property owners and municipalities, the university cooperates with the local community to protect common land. In particular, the IUL is surrounded by large areas of green land and agricultural areas owned or belonging to a municipality by city farmers, and these areas are part of IUL 's land.

IUL is introducing a university waste recycling program where the waste is first sorted on the campus of Wardanieh. For this purpose, a new initiative for the processing of plastic bottles for later recycling has been launched, where baskets are distributed within buildings. The aim is to assist deaf individuals with the amount of this program received. There are various types of containers outside the buildings for each type of waste (organic, plastic, and paper) used for storage. They are processed in university stores for paper, wood and carton waste and are sold to a warehouse to be recycled after a certain period of time. Finally, no toxic substance is contained in university waste disposal.

The IUL applies a Recycling program for university waste where firstly the waste is sorted at the Wardanieh campus. A new project has been implemented for this objective, where Baskets are distributed inside the buildings, for collecting the plastic bottles for later recycling. The objective is to help deaf persons from the collected amount of this program.

Figure 20. The baskets used to collect plastic bottles for later recycling.

Outside the buildings, there are different types of containers used for the storage each type of waste (organic, plastic, and paper).

Secondly, the different types of waste are collected by the Wardanieh municipality, and then the municipality has different programs for sorting and recycling waste.

Figure 21. Recycling program for university waste.

In order to achieve its goals for sustainable land use, the IUL organizes events and training sessions for farmers to promote the concepts of effective use of the available water resources.

In different faculties, several courses are taught to serve sustainability goals such as Environment for Engineers, Construction and Urbanism laws, Sustainable Tourism Planning, Urban planning, Citizenship and Civic Engagement.

IUL supports and promotes plans and implementation of graduation projects in the faculty of engineering that help to establish sustainability. It also encourages its students to participate as volunteers in the environmental campaigns held by some environmental associations. Moreover, the university offers all the research and logistical equipment and capabilities in support of the objectives, such as its halls and all their equipment, such as hosting workshops and lectures for societies about how to take care of the climate and breeding of birds.

In accomplishing its objectives towards the sustainable utilization of the land, the IUL organized a symposium on "The Water Crisis in the Bekaa" to celebrate World Water Day. This symposium was conducted in cooperation with the Bekaa Water Foundation and the "Italian Civil Voluntary Work" association, in the presence of the Chairman of the Board of Directors, General Director of the Bekaa Water Foundation, Head of the Urban Planning Center in Baalbek, Director of Water projects in Lebanon at the GVC Association, and academic, educational and social activities. This symposium was public directed to all the society members and especially the farmers under the title "rationalizing the use of the water in irrigating agricultural lands" in order to efficiently use the available resources for water for irrigating larger agricultural lands. This symposium presented awareness to the efficient use of water in order to meet the goals of Sustainable Agricultural Mechanization. One of the conclusions of this symposium is that Lebanon is among the Arab countries threatened by water shortage and scarcity, and better water management is required in order for us to be able to make greater use of our water. It is necessary to preserve life and the environment, and that water management must be based on a participatory, not exclusive, approach, and that household consumption and community education play an important role in water conservation and consumption, and most importantly that water has a great economic value in all [1].

Figure 22. Taken from [1]

Many courses are taught in various faculties to serve the sustainable objectives as: Environment for Engineers, Construction and Urbanism Laws, Sustainable Tourism Planning, Citizenship, And Civic Engagement.

Moreover, IUL supports and encourages the proposals and implementation of engineering graduation projects that serve sustainability development. One project entitles "Wheat Crop Mapping: Using Remote Sensing and Evaluating The NDVI and EVI Vegetation Indices Sensitivity for Wheat Estimation". This project has two objectives the first is the wheat area estimation in Lebanon using Timeseries of the Moderate Resolution Imaging Spectroradiometer (MODIS) 250 m vegetation indices (VI) datasets, the second objective is to compare the sensitivity of both EVI and NDVI vegetation indices in crop mapping and wheat discriminating. The analysis procedure involves classifying the vegetation indices based on ground data taken from the training area. Other future projects are encouraged that lead to smarter agriculture as "Smart Greenhouse Monitoring using Internet of Things (IoT)" project [2].

IUL also urges its students to participate in volunteer in the environmental campaigns for some environmental associations. One example is the volunteering of an IUL student at Beam of the Environment Association - BEA and being awarded the Best volunteer award for her efforts. BEA is an association that aims to maintain and enhance a clean and healthy coastal environment for the benefit of present and future generations while ensuring a responsible usage of the natural resources, according to the needs of the local community and building up a conscious society that is aware of their own rights and duties towards maintaining biodiversity [3].

Figure 23. Taken from [2]

The university cooperates with the local community and municipalities to ensure the conservation, restoration and sustainable use of terrestrial ecosystems associated with the university, in particular forests, gardens and agricultural areas.

The following table shows the list of the International Union for Conservation of Nature (IUCN) Red listed species in Lebanon for plants, and fish.

Table 1. International Union for Conservation of Nature

Scientific name	Category	Image	IUCN Red List group
Iris antilibanotica	Flower		Critically endangered (CR)
Garra festai	Fish		CR
Iris cedreti	Flower		CR

Bromus bikfayensis	Species of grass		CR
Pseudobithynia kathrinae	Animal		CR

The following Table shows some of the list of IUCN Red listed species in Lebanon for birds, where 12 species of birds in Lebanon are threatened, and 16 other species of birds are near threatened according to the 2014 Red List prepared by (IUCN).

Table 2. IUCN Red listed species in Lebanon for birds

Scientific name	Image
Sociable Plover	

Saker Falcon	
Egyptian Vulture	
Velvet Scoter	

The IUL aims to protect and conserve all types of species. For animals' species, it cares, protects and feed any type of non-wild animals that exist or pass across the IUL. It strictly prohibits and type of bird hunting or wild-animals shooting.

It seeks to support diversity on the level of types of trees and flowers. But, no policy at IUL is related specifically to the IUCN Red Listed species.

The university cooperates with the local community to preserve common lands, in cooperation with farmers, owners of agricultural lands, and municipalities. Especially that the IUL is surrounded by large areas of green lands and agricultural areas that are owned by the town farmers or belong to the municipality (marked in blue), and these areas are adherent to the IUL land. Therefore, the IUL seeks to preserve, protect, and develop these neighboring areas in cooperation with the local community as it does for its own areas.

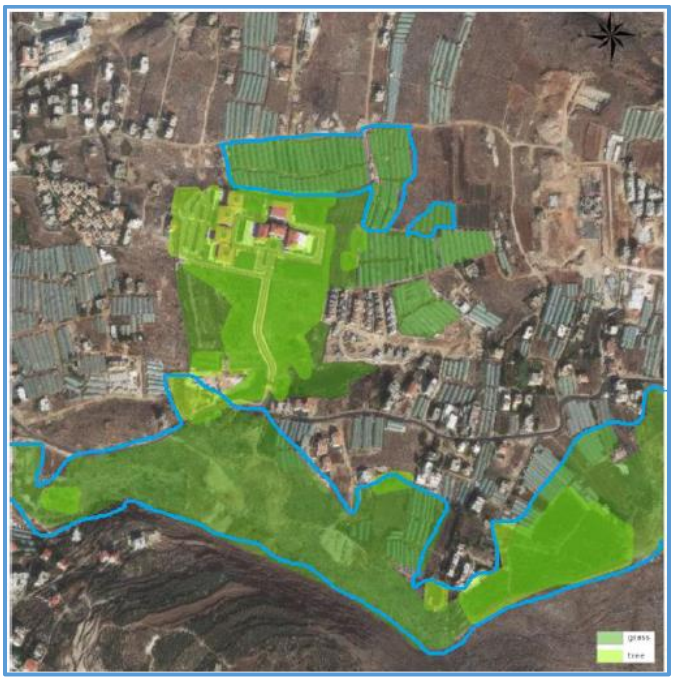

Figure 24. Neighboring areas

Conclusion and perspectives:

The Islamic University of Lebanon is developing a strategy to minimize the loss of natural habitat resources and biodiversity, and to foster global conservation of food and water, climate change mitigation and adaptation, and pollution prevention.

Landscaping for biodiversity is included in the IUL strategy: the university intended to plant more trees and to minimize grass areas accordingly. To reduce watering and maintenance needs, the planted trees are carefully selected. In addition, the university plans to host more seminars and conferences to raise the awareness of the importance of planting for people at universities and the community, how to take care of the trees, how to save the green areas, how to protect the animals, particularly the rare ones, and the best irrigation techniques for water conservation.

Another future strategy involves the projects carried out by IUL students and teachers, where IUL will promote and finance projects leading to smarter agriculture through the implementation of emerging technology as a project called "Smart Greenhouse Monitoring using the Internet of Things (IoT)".

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