



ADAPTATION FUND

REQUEST FOR PROJECT/PROGRAMME FUNDING FROM THE ADAPTATION FUND

The annexed form should be completed and transmitted to the Adaptation Fund Board Secretariat by email or fax.

Please type in the responses using the template provided. The instructions attached to the form provide guidance to filling out the template.

Please note that a project/programme must be fully prepared (i.e., fully appraised for feasibility) when the request is submitted. The final project/programme document resulting from the appraisal process should be attached to this request for funding.

Complete documentation should be sent to:

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ADAPTATION FUND

PROJECT/PROGRAMME PROPOSAL TO THE ADAPTATION FUND (AF)**PART I: PROJECT/PROGRAMME INFORMATION**

Project/Programme Category:	Project
Country/ies:	Lebanon
Title of Project/Programme:	Enhancing water sector resilience through nature-based adaptation technologies in North-Lebanon
Type of Implementing Entity:	Multilateral Implementing Entity
Implementing Entity:	Food and Agriculture Organization of United Nations (FAO)
Executing Entity/ies:	Ministry of Environment (MoE), North Lebanon Water Authority (NLWE); and (c) FAO
Amount of Financing Requested:	2,139,174 (in U.S Dollars Equivalent)

Project / Programme Background and Context:

Provide brief information on the problem the proposed project/programme is aiming to solve. Outline the economic social, development and environmental context in which the project would operate.

North-Lebanon has diverse topography, stretching along different latitudes and terrains from the highest point of Qurnat as Sawda' over 3 000 m to the Mediterranean Sea at 0 m. The region lies in the countryside of intricate river network consisting of 13 watershed, thus having high potential in water resource development. However, water resources are under immense pressure arising from climate change, rapid urbanization, competing water demand and pollution. The territories of Akkar and El Minieh in North-Lebanon are characterized by plains found on the coast of the Mediterranean Sea.

Akkar is the second largest agricultural plain after the Beqaa Valle in the country (Aw-Hassan et al, 2018 p. 8). It is characterized by a typical rural community that highly depends on natural resources. Those facts add to the vulnerability of this area to climate change impacts (ESCWA 2020, p. 25). The region has the highest poverty rate with 63.3% of its population below the poverty line (Carpi 2014, p. 4). 95 percent of the agricultural sector are micro-enterprises and small family-run businesses (El Gazzar 2015 p. 22).

Minieh is a fertile coastal plain. Significant climate issues in the area have a direct impact on agriculture are droughts and floods (USAID 2016, p. 1). This territory suffers from water scarcity combined with increasing instability of annual precipitations due to Climate Change. Approximately 70 percent of the annual rainfall is expected between November and March, while for the rest of the year the area remains dry and arid. The evapotranspiration rates are not high, but the expanding greenhouse production increases the demand for more reliable water distribution and irrigation services (MoE/UNDP/GEF 2016, p. 6).

The coastal areas of Akkar and Minieh face a number of difficult challenges connected with access to water for irrigation and municipal needs. There are risks of negative consequences of climate change, including risks of water scarcity and food security, severe floods, prolonged periods of drought and increase in average annual temperature. According to climate predictions from the PRECIS (Providing Regional Climates for Impacts Studies), by 2040 temperatures will increase by between approximately 1°C on Lebanon's coast to 2°C in its mainland. Rainfall is also projected to decrease by 10–20% by 2040 compared to current precipitation figures. This combination of significantly less precipitation and substantially warmer conditions will result in an extended hot and dry climate. Temperature and precipitation extremes will also intensify. The drought periods can also be significantly longer (Haddad et al 2014).

El-Bared water dam supplies two adjacent open-canal systems (Akkar and El-Minieh). These irrigation systems are only gravity-fed, supplied by surface water resources from the central core rock dam. They provide farmers with water and have a large capacity of average 1 100 l/s discharge in peak season. One of the main causes of the recent deterioration of Akkar and El-Minieh canals is human interference as the large parts of the canal systems are located in peri-urban areas. The high rate of urbanization, the expansion of urban infrastructures, and consequently, the reduction of arable land overstretch the capacity of water resources (FAO 2020).

Farmers on coastal territories also use groundwater for irrigation as they do not have access to other reliable water sources. This exact reliance and use lead to severe risk of sea water intrusion and land degradation due to salinization at an exponential rate (USAID 2016, p. 2). The area also sees a high level of agricultural intensity as in peri-urban areas farmers practice double cropping and multi-cropping in small land plots. Efficient water management requires more flexible water distribution that could respond to local terrain features and agrarian needs (USAID 2016, p. 3).

Syrian conflicts add instability to the region. On a per capita basis Lebanon hosts the highest number of refugees in the world. Refugee camps grow more polluted as their populations increase (ANERA 2020). A lack of working sewage and sanitation systems poses a dangerous threat to human health and the environment. Besides basic water quality indicators, not only drinking but also irrigation water is impacted by different sources of contamination, amongst which uncontrolled sewage discharge and solid waste are the most considerable. The social and natural conditions pose a heavy burden on water resources. The main issue affecting water quality in the area is the low quality and poor cleanliness of the reservoirs which are not maintained regularly and lack, for the most part, proper coverage that provides protection from external sources of contamination. Moreover, due to water scarcity, proper sanitation, and hygiene, a sharp rise in communicable diseases and the emergence of previously absent diseases were reported among refugee communities and are transmitted to Lebanese communities in close proximity (MOE/UNDP 2014, p. 5).

The capacity of current water network is neither sufficient to meet the growing demand, nor resilient to climate shocks. The infrastructure is exposed to overload in wet periods, when temporally concentrated rainfall coupled with snow melting cause increasingly severe runoff. The water conveyed through the open and public irrigation network gets heavily contaminated before reaching the drains that discharge this untreated, and consequently low quality water into the Mediterranean. In contrary, dry periods bring severe water scarcity, whereas farmers in downstream stretches of the network, in particular at coastal size remain with poor access to surface water. The full-year water use efficiency can be considered particularly low then. As response to water scarcity in dry period, supplemental irrigation from groundwater resources in coastal sides lead to over-abstraction, potential use of saline water in agricultural lands and salt front shifted towards upstream lands. Due to climate change impacts,

increasing intensity of alternating periods of severe runoff and water scarcity in such poor infrastructural context poses multiple risks including low resilience of farmer communities, higher exposure of coastal communities to climate change impacts and deterioration of ecosystem with significant food security implications.

These conditions will have a direct impact on livelihoods and health of local communities and generate significant climate and food security risks for the region. Given these challenges, there is an imperative need to adapt climate change impacts to protect water resources, including surface and groundwater, and ecosystems including marine and terrestrial ecosystems. In recent years, there has been an increase of interest in climate change adaptation measures that are less related to solutions based on grey infrastructures. Climate change adaptation measures can include the use of ecosystems or hydrological-ecological, i.e. nature-based processes, which act as an alternative and in complementary manner to grey infrastructure. These solutions can be quite cost-effective due to low investment costs and straightforward utilization. (UNO 2015, p. 17).

One of the keys to enhancing adaptation and reducing vulnerability to these climate risks is water. Tackling the issues of water resource management in Akkar and EI-Minieh areas from the different dimensions of technical interventions, policies, governance, and multi-level capacities, which is what the proposed project will critically initiate, will be central for building the country's response to the impacts of climate change (UNO 2015, p. 19).

Project / Programme Objectives:

List the main objectives of the project/programme.

The Overall goal of the project is to increase the capacity of communities and regional institutions to adapt to climate change and decrease vulnerability to climate induced risks and shocks through inclusive planning and implementation of Nature Based Adaptation Technologies (NBATs) and the enhanced monitoring of water resources. To accomplish this the project proposes three specific components presented below:

- Component 1: Strengthening climate resilience of coastal farmer communities through the development of nature-based adaptation technologies (NBAT) for enhanced and sustainable management of water resources
 - *This is consistent with AF Outcome 1: Reduced exposure to climate-related hazards and threats;*
 - *This is consistent with AF Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes*
 - *This is consistent with AF Outcome 4: Increased adaptive capacity within relevant development sector services and infrastructure assets.*
 - *This is consistent with AF Outcome 5: Increased ecosystem resilience in response to climate change and variability-induced stress.*
- Component 2: Increasing adaptive capacity and awareness on water governance sector in North-Lebanon
 - *This is consistent with AF Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses;*
 - *This is consistent with AF Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes;*

- *This is consistent with AF Outcome 4: Increased adaptive capacity within relevant development sector services and infrastructure assets.*
- *This is consistent with AF Outcome 7: Improved policies and regulations that promote and enforce resilience measures*
- Component 3: Strengthening the enabling environment for accelerating climate adaptation in water sector in North-Lebanon
 - *This is consistent with AF Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses;*
 - *This is consistent with AF Outcome 4: Increased adaptive capacity within relevant development sector services and infrastructure assets.*

Project / Programme Components and Financing:

Fill in the table presenting the relationships among project components, activities, expected concrete outputs, and the corresponding budgets. If necessary, please refer to the attached instructions for a detailed description of each term.

For the case of a programme, individual components are likely to refer to specific sub-sets of stakeholders, regions and/or sectors that can be addressed through a set of well-defined interventions / projects.

Project Components	Expected Outcomes	Expected Concrete Outputs	Budget (\$US)
1. Strengthening climate resilience of coastal environment and farmers' communities through the development of Nature-Based Adaptation Technologies (NBATs) for enhanced and sustainable management of water resource	1.1. Access to and management of sustainable water resources are enhanced through NBATs for coastal farming communities most vulnerable to multiple impacts of climate change	1.1.1. Outlets of drain network reengineered and connected to collect water for remediation and reuse for agricultural purposes in high-density coastal areas 1.1.2. Green phytoremediation infrastructure (vertical constructed wetland) for climate-smart management of water resources constructed at the outlet of collector drain to increase water supply for agricultural production for coastal farm communities 1.1.3. Augmentation structure developed to reverse water exploitation and saltwater intrusion in coastal areas	1,200,000
	1.2. Vulnerable farming communities are empowered to adapt to the impacts of climate change through crowdsensing-based water monitoring	1.2.1. Monitoring system linked to: (a) Regional Prototype Monitoring System, (b) Weather stations and (c) Early warning mobile application is deployed in pilot farms to control and prevent water exploitation and enhance evidence-based decision-making on water resource management 1.2.2. E-platform developed to provide access to crowd-sensed water monitoring data 1.2.3. Capacity-building programme on the use and operation of the monitoring system	

		provided	
2. Increasing adaptive capacity and awareness on water governance sector in North-Lebanon	2.1. Inclusive policy support tool for multiple stakeholders is developed and validated to enhance NBAT mainstreaming in water governance sector in North-Lebanon	2.1.1. Climate adaptation NBATs mapped and assessed with participatory approach set in place 2.1.2. Guides for policymakers, practitioners, and local farming communities prepared to enhance climate adaptation and mainstream NBATs into planning processes with an explicit focus on the water sector	320,000
	2.2. Awareness on the climate related water security and ownership of NBATs are enhanced	2.2.1. Local communities and professionals of competent authorities trained on policy-support tool and on-site demonstrations	
3. Strengthening the enabling environment for accelerating climate adaptation in water sector in North-Lebanon	3.1 Climate-proofing financing to support climate adaptation is strengthened	3.1.1. Sub-national vulnerability and risk assessment situation analysed and updated and scaled up. 3.1.2. Climate-proofing financing strategy developed to support NBATs in water sector with a specific focus in North Lebanon	264,288
Project Execution Costs (9.5%) - Salary of project staff; Project financial reports; RBM; Final Evaluation costs; Office facilities, equipment and communications; Travel related to project execution; Project financial audit.			187,301
Total project costs			1,971,589
Project/Programme Cycle Management Fee charged by the Implementing Entity			167,585
TOTAL BUDGET			2,139,174

Projected Calendar:

Indicate the dates of the following milestones for the proposed project/programme

Milestones	Expected Dates
Start of Project/Programme Implementation	09-2021
Mid-term Review (if planned)	02-2023
Project/Programme Closing	08-2024
Terminal Evaluation	10-2024

PART II: PROJECT / PROGRAMME JUSTIFICATION

- A. Describe the project / programme components, particularly focusing on the concrete adaptation activities of the project, and how these activities contribute to climate resilience. For the case of a programme, show how the combination of individual projects will contribute to the overall increase in resilience.

The project rationale: Enhancing climate resilience in North-Lebanon through nature-based adaptation technologies in water sector

According to climate predictions from PRECIS, by 2040 temperatures will increase by between approximately 1°C on Lebanon's coast to 2°C in its mainland. Rainfall is also projected to decrease by 10–20 % in the next two decades. This combination of significantly less precipitation and substantially warmer conditions will result in an extended hot and dry climate. Temperature and precipitation extremes will also intensify and drought periods can be longer. These conditions will have a direct impact on livelihoods and the health of local communities and generate a significant climate security risk for the region (Haddad et al 2014). Specific future demand scenarios with detailed projections for the areas of intervention will be elaborated at the stage of full proposal together with quantification of the impacts on the agricultural sector and the knock-on effects on food security and the overall economy.

The project will be implemented in North-Lebanon coastal side, more specifically at El-Minieh and Akkar stretches. The project is complementary with two FAO-led on-going initiatives in the region, one related to multidimensional water resource monitoring financed by the Swiss Agency for Development and Cooperation, and the other to solid-waste reduction in irrigation network to improve livelihoods financed by the Government of Norway (please refer to Table 6). The established monitoring system (Prototype Monitoring System) is a computer-based tool for integrated monitoring and management of water resources (discharge, water quality, water use and climatic parameters) that creates compatible architecture to extend the scale and functions. Regular monitoring shows cumulative exposure to climate change impacts that is further aggravated by environmentally harmful social trends. Areas in higher elevation are exposed to damaging runoff with currently unaddressed consequences such as soil erosion, gully expansion, uncontrolled sedimentation load and deteriorating infrastructure. The area is also hit by physical water scarcity. In the same place, farmers use supplementary irrigation from groundwater sources from as deep as 200-250 m groundwater tables, thus facing both technical (energy source) and financial constraints. Economic water scarcity is arising as groundwater tables are further shrinking. The runoff from higher elevation is recently unutilized despite of the water scarcity in dry periods. Storing capacity of current infrastructure is not sufficient to adapt large flows and reserve water supply for dry periods.

Figure 1: Project command area with subzones

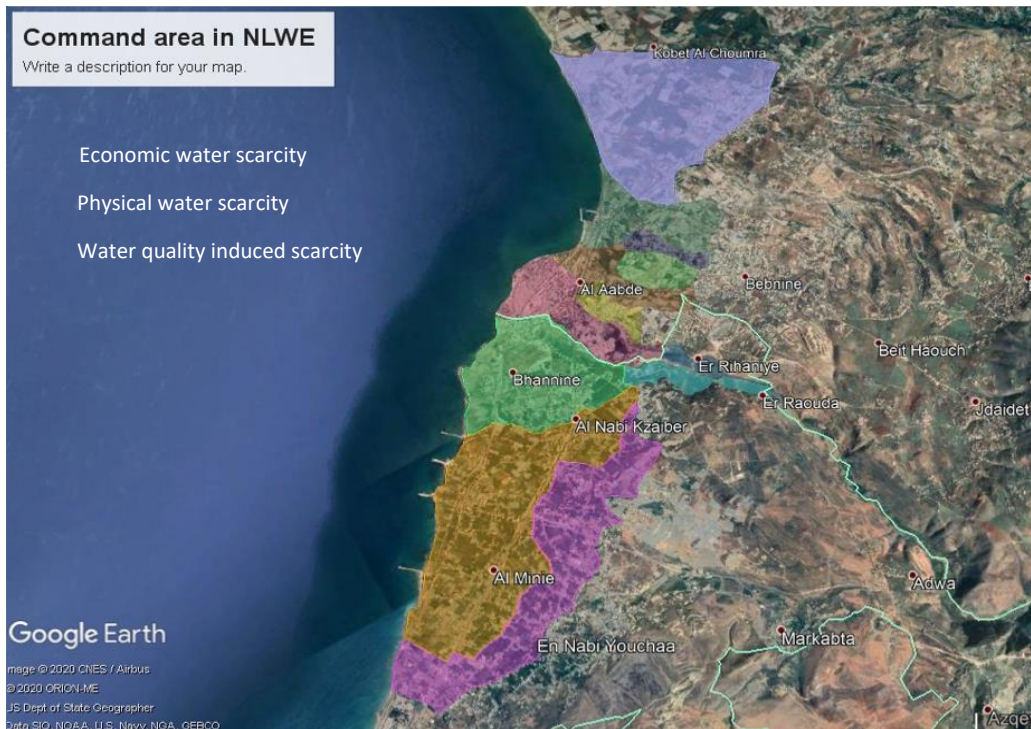


Figure 2: Project command area (coastal area zonification)



One of the key areas to enhancing adaptation and reducing vulnerability to these climate and food security risks is water. Improving access to surface water resources through water reuse and groundwater augmentation is key adaptation strategy to adapt compounding impacts of climate change and human-induced water scarcity. Climate change together with environmental degradation, rapid urbanization and increasingly competing demands for water resources put enormous pressure on water resources availability. In North-Lebanon, farmer communities in coastal sides have little or no access to surface water, thus being forced to use and eventually exploit groundwater resources. Groundwater

resources at coastal sides are not only in threat of overexploitation but exposed to saltwater intrusion. The current adverse trends of irrigation with groundwater at coastal sides has multiple adverse impacts on natural resources and productive assets. On the other side, a significant amount of contaminated water is discharged into the Mediterranean Sea and reaches the marine ecosystem untreated.

The project proposes an integrated intervention around Nature-Based Adaptation Technologies (NBATs) to supply water to vulnerable farming communities in the coastal zones and to remedy contaminated water carried by the drain network. The current proposal recognizes that water scarcity is not a standalone issue. This particularly important in the light of recent water use trends. Current FAO assessment highlighted the low level of efficient resource use. Evidence shows that agriculture has a great potential to move towards higher productivity without additional water resources, as the current water productivity of the cropping pattern is low in the command area (e.g. citrus has an average 3.07 kg/m³ water productivity compared to the >7 kg/m³ global average, field crops have an average 1.84 kg/m³ compared to the 2.45 kg/m³ global average). The current water management practices widely vary due to the uneven access to water resources and (e.g. the applied irrigation amount in orchards ranges from 200 mm to 1 900 mm). Farming practices together with improper irrigation practices, then, have currently uncontained impact on environment (e.g. pesticide infiltration, salinization, agrochemical leaching, etc.), in return, the polluted environment adversely affects the agriculture and livelihood. This vicious cycle highlight that water is very much connected to food security and to the energy sector and it is in this regard that the full proposal will endeavor to describe in detail the roll out of an inter-linked (nexus) approach from the angle of climate change adaptation both in terms of the NBAT as a proposed solution, but also on the governance and the enabling environment of solutions as such. The exact activities of the proposed project will be presented in the full project proposal and they will be developed as a set of activities that address the adverse impacts and risks posed by climate change, using the water sector as an entry point. Vulnerable communities will be identified at the stage of full project proposal on the basis of a vulnerability assessment which will utilize environmental and socio-economic criteria such as access to water, exposure to salinity, income level and income foregone et al. The proposed interventions will have multiple gains for both the environment and the farming communities:

- Supplying farmers with good quality irrigation water, thus reducing exposure to climate-induced water scarcity and reduction of food security risks.
- Capturing heavily polluted water and providing nature-based technology for remediation, thus significantly improving the status of coastal ecosystem.
- Recharging groundwater tables with freshwater, thus shifting the transition zone of salt front further downstream and building resilience to saltwater intrusion by sea-level rise.
- Building multi-level capacities to identify and implement nature-based adaptation technologies as climate-proofing and food security solutions.
- Creating the enabling environment for funding nature-based adaptation technologies as climate proofing and food security solutions.

Tackling the issues of water resources management in North Lebanon from the different dimensions of technical interventions, policies, governance, and multi-level capacities, proposed by the project, will be central for building the country's response to the impacts of climate change. The project will endeavor to employ a nexus approach (Water, Energy, Food, Environment) which will be further described at the stage of full proposal in order to work on the interlinkages between water, energy, food and environment wherever possible and to structure longer-term trends along the interfaces.

The objectives of the current project proposal are in line with national priorities, especially the 2020 INDC, AF Outcome Areas and the National Agricultural Strategy, resulting in the following components:

Component 1: Strengthening climate resilience of coastal environment and farmers' communities through the development of Nature-Based Adaptation Technologies (NBATs) for enhanced and sustainable management of water resources

This component is focused on developing and pilot testing a Nature Based Adaptation Technology that will augment, on one side water resources, and on the other side treat contaminated water through a natural rootzone solution. The constructed wetlands will be directly connected to existing drain network along the coastal side that has originally multiple outlets to the Mediterranean. Heavily contaminated water conveyed by stormwater drains in the coastal sides will be biologically treated in the rootzone and soil through aerobic and anaerobic processes respectively, which will biodegrade contamination and decompose chemical and biological pollutants respectively. The technology supplies effluent with higher quality that can be conveyed back and reused for agricultural and environmental purposes, namely for irrigation and groundwater recharge. The solution to be rolled out and pilot-tested exhibits a set of certain advantages: (1) it is based on natural processes, (b) it is consistent with water quality of effluents, (c) has low capital investment, (d) has a long lifespan, (e) it is effective for biological, chemical, and physical treatment of water, and (f) is compatible with participatory management processes (which the proposed project will endeavor to employ). In order to strengthen communities' ownership and build their capacities on water resource conservation, participatory water monitoring mechanism will be developed on digital platform and connected to existing regional water monitoring system (Prototype Monitoring System). This multidimensional monitoring system already includes modules for discharge, water quality, agricultural water demand and O&M of irrigation assets. The project will mostly rely on and complement the module of water quality monitoring by integrating the observations in coastal sides, thus allowing the regular monitoring of water for aquifer recharge. A manual for water quality monitoring is appended to the Prototype Monitoring System, which includes a protocol on recommended quality standards. By having this solid ground for water quality management, the project will be in line with national technical standards. Component 1 will be delivered through six distinct outputs:

- 1.1.1. Outlets of drain network reengineered and connected to collect water for remediation and reuse for agricultural purposes in high-density coastal areas.
- 1.1.2. Green phytoremediation infrastructure (vertical constructed wetland)
- 1.1.3. Augmentation structure developed to reverse water exploitation and saltwater intrusion in coastal areas
- 1.2.1. Monitoring system harmonized and connected
- 1.2.2. E-platform developed to provide access to crowd-sensed water monitoring data
- 1.2.3. Capacity-building programme on the use and operation of the monitoring system provided

Component 2: Increasing adaptive capacity and awareness on water governance sector in North-Lebanon

This component will endeavor to address the policy and governance angle of the water sector in North Lebanon. The majority of the water infrastructure development in the region was implemented before 1990s and was not designed with environment and water conservation in mind. As a result, the nature-based investment (green investment) remained silent against grey investment in the development processes. Water infrastructure in the region demonstrates well the syndrome of the biased investment design of concrete central core dams, impermeable conveyance structures and buried pipe drains. By

now, the majority of the infrastructure has reached its end of lifespan, become heavily deteriorated and performs only at a fraction of its design capacity. Compounded with the pressure of urbanization, investment that complies with sustainability and socio-economic objectives requires new avenues for the water sector. More importantly, development must be in line with the high-level protection and improvement of the quality of the environment. Yet development processes nurtured by nature is, however, unexplored in the country. The project will directly target this experience gap in green investment for water sector. The component will work on the development of a support tool for multi-level stakeholders to be able to own and utilize NBATs as solutions to water related issues in the face of climate change and ultimately increase multi-level adaptive capacities. The mapping will identify both the existing and the potential NBATs in the country and it will provide recommendations on evidence-based practices and solutions to be trialed. The outcomes of this component have a significant potential for scale up and replication not only within Lebanon, but also for many countries with similar environment. The outputs of component 2 are the following:

- 2.1.1. Climate adaptation NBATs mapped and assessed with a participatory approach set in place
- 2.1.2. Guides for policymakers, practitioners, and local farming communities prepared to enhance climate adaptation and mainstream NBATs into planning processes with an explicit focus on the water sector
- 2.2.1. Local communities and professionals of competent authorities trained on policy-support tool and on-site demonstrations

Component 3: Strengthening the enabling environment for accelerating climate adaptation in water sector in North-Lebanon

This component will initiate and complement the work needed on the enabling environment for the generation and implementation of climate adaptation solutions by using the water sector in North Lebanon as the entry point. Component 3 will create the evidence base by formally updating the knowledge around climate-induced vulnerability and risks in North Lebanon, but will also complement components 1 and 2 by casting light on the potential funding sources for climate-proofing by delivering a comprehensive financing strategy with a focus on NBATs in the water sector of North Lebanon. This component will upscale the project's intervention into an integrated solution for the enhancement of climate resilience in the target area, but will also create a blueprint for other areas and sectors to build on. Component 3 will be delivered through the following outputs:

- 3.1.1. Sub-national vulnerability and risk assessment situation analyzed and updated and scaled
- 3.1.2. Climate-proofing financing strategy developed to support NBATs in water sector with a specific focus in North Lebanon

B. Describe how the project / programme provides economic, social and environmental benefits, with particular reference to the most vulnerable communities, and vulnerable groups within communities, including gender considerations. Describe how the project / programme will avoid or mitigate negative impacts, in compliance with the Environmental and Social Policy of the AF.

North and Akkar Governorates belong to the most deprived regions, officially accounting for 532000 out of 1.164 million people living in poverty and specifically for Akkar the poverty rate is 63.3% (Carpi 2014). The consecutive and multidimensional disasters of economic crisis, cataclysmic blast and COVID-19 in 2020 led to an even more devastating situation, turning 55% of the country's population into poverty which is definitely more pronounced in the North. This rate is almost double the rate of 2019. These events are superimposed onto the pre-existing vulnerabilities, which overstretches the

country's capacities to cope with the multiple crises. The population of Akkar and El-Minieh is mainly composed of vulnerable communities, as most of it lives in rural areas and its prosperity depends on the agricultural sector. Akkar is a Governorate on its own (Akkar Governorate) and covers 788 km² with a population of 389,899. including 106,935 registered refugees of the Syrian Civil War and 19,404 Palestinian refugees. According to official data from UNHCR (2014)¹ the proportion of refugees compared to the total population in the Cadastral zone accounted for approx. 15%. However, with the escalation of multiple crises in the region that portion has more recently increased to approx. 30% as Akkar is now the temporary home for 106,935 registered refugees of the Syrian Civil War and 19,404 Palestinian refugees.

The region is coastal with distinct mountainous areas and plains. Agriculture is the main economic activity in Akkar with 28,092 registered agricultural operators, and employs significant part of the local population (22% of male and 27.3% of the female working force). The plains of Akkar, are known for its greenhouse production, citrus trees, orchards, cereals and market gardening such as vegetables and legumes, whilst majority of farms is small in size with almost 90 percent between 1-4ha.

El-Minieh, which is a part of the North Governorate, is characterized by continued poverty as described above and increasing vulnerability in social and economic sectors. Its coastal zone is undergoing alarming agri-ecosystem degradation with high levels of water pollution. The population of El-Minieh is 30,878 and the territory is 10.6 km². According to the same UNHCR data from 2014 the percentage of refugees compared to total population in the Minieh Cadastral zone accounted for approx. 44%. More recent data sources indicate, especially for Minieh that the numbers of registered and unregistered refugees in sum have exceeded the pre-crisis population and that these refugees are considered to be among the most impoverished (Ossmane et al 2018). Citrus, horticulture and greenhouse production are the major agricultural produce from this area. The population working in the agricultural sector is 21%. Women are the primary labor force in agriculture, and largely responsible for seasonal agricultural activities such as sowing, weeding, and harvesting fruits and vegetables. Men are primarily responsible for handling heavy machinery, greenhouse construction and transporting crops.

The communities in coastal zones of Akkar and El Minieh face serious economic challenges because of saltwater intrusion, inability to access quality water, droughts and soil degradation exacerbated by climate change and by the refugee crisis. According to NRC² (2016) 57% of Syrian refugees and 86% of Palestinian refugees do not have the ability to gain legal refugee status in Akkar and El-Minieh. Adding to impacts of climate change, human interference makes water resources not only insufficient in quantity but harmful by its quality. Based on the results of a Prototype Monitoring System already in place, bacteriological monitoring of the downstream areas regularly reports multiple times higher E-coli, total coliform and fecal coliform counts than the national minimum standard³. This greatly unhealthy environment is of particular danger for women, who are responsible for daily work in the lands. The effects spill over other vulnerable groups, as irrigating and spraying fresh vegetables (lettuce, tomato, eggplant etc.) with contaminated water has health impacts. Decreasing amount and concentrated healthy rain in dry periods, which is expected to increase under climate change, further aggravates the issue in lack of dilution and flush-away of contaminated water. The proposed project focuses on the solution of environmental problems in these areas, as it will help to increase agricultural productivity, provide for more efficient use of water, assist in combating droughts and groundwater/soil salinization, and improve water quality.

¹ Population data UNHCR 2014

² NRC, 2016. Women refugees in Lebanon and the consequences of limited legal status on their housing, land and property, Norwegian Refugee Council

³ The publication on lessons from water quality monitoring in North-Lebanon is on-going. The background documents will be provided in the full proposal.

The project is expected to bring numerous economic, environmental and social benefits. Outlets of drain network will be reengineered and connected to collect water for remediation and reuse for agricultural purposes in high-density coastal areas. This will preserve soils from salinization and provide the agricultural sector with water in periods of drought. A green phytoremediation infrastructure will be developed and pilot-tested to showcase how quality water supply can be increased for agricultural production in coastal farm communities and beyond. The envisaged economic and environmental advantages provide an excellent reason for the use of this approach in the treatment of contaminated sites. The improvements in the agricultural sector will support the livelihoods of vulnerable communities, households and individuals. Better access to clean water will also contribute to increasing the level of health standards in refugee camps as well as in local settlements. The project will also seek to engage refugees through specific job-creating activities in coordination with the executing agencies in the frame of the efforts to support as mentioned above the livelihoods of the vulnerable. Such involvement modality is currently successfully implemented in the target area in support of the most vulnerables. Based on the experiences, the identified best practices can be brought forward to design equally accessible and inclusive job-creating activities. A more thorough description of the refugee engagement approach is envisaged to be included in the full project proposal. Adding to these benefits, the technology produces biomass as bi-product that could provide, if used appropriately, economic and social gains for communities. Depending on the selected variety, evidence show that the yield of wetlands can range between annual 12-30 ton per ha. The harvesting, processing, and purposing of yields will be decided and managed through the cooperation with local stakeholders. Gender considerations will be incorporated in the project through a specific cross-cutting gender component at the level of project activities in compliance with AF gender policy, which will be included in the full proposal.

Table 1: Proposed project social, economic, climate, and environmental benefits

Benefit	Current problem	With/after the project
Economic	<p>The economy of Akkar and El-Minieh areas is closely connected with climate change. Less rain, droughts, soil salinization deteriorate the livelihoods of farmers and increase food security risks.</p> <p>The target area consists of around 1 255 ha, of which around 20-30 percent in the tails of the irrigation canals do not receive sufficient water due to engineering and water distribution issues. This long-standing problem is exacerbating in the light of rapidly evolving climate change impacts, perceived already by farmers (most frequently shift in rainy season, droughts and increasing temperature). Field observation showed that canals run dry at the end of the irrigation network or run underground thus preventing farmers from surface water withdrawal. Farmers seeking for alternative source use groundwater in the coastal side area. Even over relatively small distance from the Sea, the groundwater depth sharply declines (from around 20 to over 200 m). The</p>	<p>Water quality, availability and efficient use will increase, subsequently supporting farmers to achieve better yields, and increase farm diversification and sustainability. The government at different levels, together with communities, will be able to better assess, plan and manage water resources which are also of economic significance. The agricultural sector in target areas will be more resilient to climatic risks with sustainable solutions of low initial investment and long lifespan implemented.</p> <p>The project will have a positive impact through enhanced water supply in the area, particularly for the farms in the coastal area currently crowded out from the surface irrigation network (20-30 percent of the total production area)</p> <p>It is estimated that the discharge of one small-size irrigation outlet can provide</p>

	<p>rapidly dropping groundwater table, then, induces a risk for farm profitability of farmers.</p> <p>Irrigation outlets discharge around estimated 10-40 l/s per outlet contaminated and untreated water directly into the Mediterranean. To make matters worse, the number of informal outlets are increasing as people damage and cut the irrigation network in urban areas.</p>	<p>sufficient water for around 50 ha greenhouse production (calculated by 3 200 m³ crop water requirement of zucchini in the target area). The project will exploit the reuse potential of the main and informal outlets to maximize its impact on water security</p>
Climate	<p>Less rain, droughts, soil salinization deteriorate the livelihoods of the rural population of Akkar and El Minieh.</p>	<p>The agricultural sector in target areas will be more resilient to climatic risks with sustainable solutions of low initial investment and long lifespan implemented.</p> <p>The government at different levels, together with communities will have updated knowledge on the climate induced risks and vulnerability, the capacities to identify and implement climate solutions, and will also obtain tangible guidance on how to finance climate solutions.</p>
Social	<p>Women and vulnerable groups (refugees, farmers whose yields have been decreased) suffer from a lack of water for municipal and irrigation needs, and low water quality, but also significant food security issues.</p> <p>Highly vulnerable groups, such as women carrying out household work and informally settled Syrian refugees in the area are under immense threat of polluted environment. It is estimated that around 45 km of canal stretch runs through the urban areas, including the refugee settlements. As these are open-canal, the direct connection with the contaminated water imposeses health risk to the most vulnerable without proper housing facility.</p>	<p>Improvement in water management will contribute to social well-being and avoid any tension between refugees and local communities that may arise due to insufficient water resources.</p> <p>Women, who constitute the majority of daily field workers, will have healthier environment by decreasing of the bacteriological infection from irrigation water.</p> <p>Vulnerable groups, in particular women, old, young and people with health issues will have access to healthy fresh vegetables.</p> <p>Health and hygiene aspects will improve due to the increased availability of quality water.</p> <p>Coastal environment will be healthier due to the treated water and decreased contaminated water discharge in to the Mediterranean (country evidence shows that wetlands can decrease biological oxygne demand by 66 %, nitrites by 33 %, ammonia by 93%, phosphorus by 82%, sulphate by 16%) (Amacha, 2017)</p>
Environmental	<p>Severe environmental degradation has taken place throughout the coastal area of Akkar and El Minieh – Droughts, floods, disposal of wastewater, climate change lead to continuing coastal erosion. As a result, the</p>	<p>Augmentation structures will be developed to reverse water exploitation and saltwater intrusion in coastal areas and ground water tables will be recharged with freshwater.</p>

	stability of coastal agri - ecosystems is increasingly deteriorating with subsequent food security issues.	The status of the coastal ecosystem will be significantly improved due to the capture and remediation of heavily polluted water. Water quality, availability and efficient use will increase subsequently improving the ecosystem services of the area including production of food adding to their sustainability.
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C. Describe or provide an analysis of the cost-effectiveness of the proposed project / programme.

The proposed intervention aims at reducing exposure to climate induced water scarcity through pilot testing of a scalable NBAT and increasing multi-level adaptive capacities to manage climate risks with a focus on the water sector in North Lebanon. Detailed costs per activity will be provided during the full proposal phase, including cost effectiveness (cost per person). The project will maximize the amount of investment in concrete interventions over soft ones (as evident from the proposed budget of Component 1).

The project will also make investments on soft activities which will be directly supportive to the concrete investment (e.g. policy dimension, financing strategy) and will help to sustain and replicate the benefits of the project. This approach is expected to maximize the adaptation benefits per dollar invested in the sense that: a larger soft component investment would risk not translating into adaptation benefits (i.e. failing to deliver a complete pilot and test), while a larger concrete focus may risk not building sufficient capacities or other enablers to sustain or replicate the same adaptation benefits. During the full proposal development phase, cost-effectiveness of each proposed project activity will be analyzed in a quantitative manner, including more detailed comparison with alternative activities.

The project will ensure cost-effectiveness by incorporating the following notions:

- Avoidance of future costs associated with damage, loss, and maintenance of the solution as the intervention is (a) nature based, (b) has a low capital investment and operating expenses and (c) a long lifespan.
- Efficient project operations because of 'in-house' technical support options and capacity building expertise but also because of direct partnering with communities (thereby increasing their ownership, building their capacity as well as reducing costs).
- Community involvement with the mapping, identification, and development of concrete NBAT interventions and because of multi-level capacity building (thereby increasing ownership and building capacity across the board, as well as reducing costs).
- Selected final technical product to be based on cost-feasibility and resilience/sustainability criteria (assessment to be done during full proposal).

Nevertheless, at this stage, and in order to preliminarily assess cost-effectiveness, the proposed solution is compared with two alternative scenarios (A) water treatment plant for water reuse and (B) modernized irrigation system combined with equipment of households with wastewater disposal facilities.

Scenario A would require complete re-engineering of the drain system with buried collector pipes and the use of an existing facility (such as the Tripoli treatment plant). Depending on the number of connected households just the costs of connection would range anywhere from \$US3.5 million to \$US26 million with costs of treatment adding \$USD 0.05-0.36 / m³ per household⁴. This scenario would come with significant capital investments and operating expenses.

Scenario B would involve a new design of pressured distribution with drip system and septic tanks that would turn the current open canal system to a piped one from source (El-Bared dam) to field. This scenario⁵ entertains an uncertain pump station investment, a \$US 7 million for a drip irrigation system for the current command area, and a range of \$US 1500-2500 for septic tanks per household (a total of \$US 3 million).

- D. Describe how the project / programme is consistent with national or sub-national sustainable development strategies, including, where appropriate, national or sub-national development plans, poverty reduction strategies, national communications, or national adaptation programs of action, or other relevant instruments, where they exist.

Project alignment with government priorities

Lebanon ratified the United Nations Framework Convention on Climate Change in December 15th 1994, acceded to the Kyoto Protocol in 2006 and ratified the Paris Agreement on Climate Change on March 29th 2019. The country submitted three national communications to the United Nations Framework Convention on Climate Change in 1999, 2011 and 2015 Lebanon has submitted the currently active NDC (Nationally Determined Contribution) in 2015, however, the proposed project features alignment with the draft updated NDC of 2020 as this is expected to be approved by the government in January 2021. In that sense the project proposal team decided to utilize the still non-official INDC of 2020 (at the time of the elaboration of this project concept) and is fully aware that the alignment will be revisited at the stage of the full project proposal. The project exhibits full alignment with NDC 2020 but also with the NAS (National Agriculture Strategy) of 2020 and the draft Updated Water Sector Strategy of 2019⁶ (Specifically objectives A.1, A.4, and A.6 for Component 1) , as key documents for the agri-environmental sector and the proposed project's thematic area. The proposed components also exhibits alignment with the Lebanon Crisis Response Plan for all three proposed components. Finally, and in terms of relevance to the Sustainable Development Goals the proposed project is expected to contribute to Goals: 6 (clean water and sanitation), 11 (sustainable cities and communities) and 13 (climate change), but also 1 (no poverty), 3 (good health and well-being), 5 (gender equality), 9 (innovation and infrastructure), 10 (reduced inequalities), and 16 (peace and justice).

Table 2: Project proposal alignment with selected national priorities (Component level)

Components	NAS	NDC	2nd National Communication to UNFCC⁷	Lebanon Crisis Response Plan

⁴ Scenario A: Based on costs of similar projects available [here](#) and [here](#) and own calculations

⁵ Scenario B: Based on costs of similar projects available [here](#) and own calculations

⁶ [Slide 1 \(pseau.org\)](#)

⁷ Republic of Lebanon Ministry of Environment ,2011. "Lebanon's Second National Communication to the United Nations Framework Convention on Climate Change", Beirut, viewed 24 Dec. 2020, <<http://climatechange.moe.gov.lb/viewfile.aspx?id=19>>.

				(2017-2020) ⁸
Strengthening climate resilience of coastal environment and farmers' communities through the development of Nature-Based Adaptation Technologies (NBATs) for enhanced and sustainable management of water resources	X	X	X	X
Increasing adaptive capacity and awareness on water governance sector in North-Lebanon	X	X	X	
Strengthening the enabling environment for accelerating climate adaptation in water sector in North-Lebanon	X	X	X	

Table 3: Proposed project alignment with key national strategies (Output level)

Project/Programme Components	NDC 2020	NAS ⁹
<p>1. Strengthening climate resilience of coastal environment and farmers' communities through the development of Nature-Based Adaptation Technologies (NBATs) for enhanced and sustainable management of water resources.</p> <p>1.1.1. Outlets of drain network reengineered and connected to collect water for remediation and reuse for agricultural purposes in high-density coastal areas.</p> <p>1.1.2. Green phytoremediation infrastructure (vertical constructed wetland) for climate-smart management of water resources constructed at the outlet of collector drain to increase water supply for agricultural production for coastal farm communities.</p> <p>1.1.3. Augmentation structure developed to reverse water exploitation and saltwater intrusion in coastal areas.</p>	<p>Adaptation priority 1: Strengthen the agricultural sector's resilience to enhance Lebanon's agricultural output in a climate-smart manner.</p> <p>Adaptation priority 3: Structure and develop sustainable water services, including irrigation, in order to improve people's living conditions.</p> <p>Adaptation priority 5: Reduce the vulnerability of climate change impacts on coastal zones, especially in cities.</p>	<p>Programme 1.1: Ensure and facilitate access to inputs and tools to maintain agricultural production capacity.</p> <p>Programme 1.3: Reduce risk of worsening levels of food and nutrition insecurity.</p> <p>Pillar 2: Increasing agricultural production and productivity.</p> <p>Programme 2.3: Encourage and support the adoption of innovative and modern technologies.</p> <p>Programme 2.4: Improve the quality and safety of agricultural and food products.</p> <p>Pillar 4: Improving climate change adaptation and sustainable management of agri-food systems and natural resources.</p> <p>Programme 4.2: Promote sustainable use of natural resources (soil, pastures, forests and fisheries).</p> <p>Programme 4.3: Enhance the efficient use of irrigation water and expand the supply of water resources for irrigation.</p>

⁸ Government of Lebanon and the United Nations, 2020. "Lebanon Crisis Response Plan 2017 - 2020", viewed 24 Dec. 2020, <<https://data2.unhcr.org/en/documents/details/74641>>.

⁹ Lebanese Republic Ministry of Agriculture, 2020. "Lebanon National Agriculture Strategy (NAS) 2020 – 2025", viewed 24 Dec. 2020, <<http://www.agriculture.gov.lb/getattachment/Ministry/Ministry-Strategy/strategy-2020-2025/NAS-web-Eng-7Sep2020.pdf?lang=ar-LB>>.

<p>1.2.1. Monitoring system linked to: (a) Regional Prototype Monitoring System, (b) Weather stations and (c) Early warning mobile application is deployed in pilot farms to control and prevent water exploitation and enhance evidence-based decision-making on water resource management.</p> <p>1.2.2. E-platform developed to provide access to crowd-sensed water monitoring data.</p> <p>1.2.3. Capacity-building programme on the use and operation of the monitoring system provided.</p>		<p>Pillar 5: Strengthening the enabling institutional environment.</p> <p>Programme 5.2: Strengthen the efficiency and effectiveness of the agricultural and knowledge information system (AKIS).</p>
<p>2. Increasing adaptive capacity and awareness on water governance sector in North-Lebanon.</p> <p>2.1.1. Climate adaptation NBATs mapped and assessed with participatory approach set in place.</p> <p>2.1.2. Guides for policymakers, practitioners, and local farming communities prepared to enhance climate adaptation and mainstream NBATs into planning processes with an explicit focus on the water sector.</p> <p>2.2.1. Local communities and professionals of competent authorities trained on policy-support tool and on-site demonstrations.</p>	<p>Adaptation priority 1: Strengthen the agricultural sector's resilience to enhance Lebanon's agricultural output in a climate-smart manner.</p> <p>Adaptation priority 3: Structure and develop sustainable water services, including irrigation, in order to improve people's living conditions.</p>	<p>Pillar 2: Increasing agricultural production and productivity.</p> <p>Programme 2.3: Encourage and support the adoption of innovative and modern technologies.</p> <p>Pillar 4: Improving climate change adaptation and sustainable management of agri-food systems and natural resources.</p> <p>Pillar 5: Strengthening the enabling institutional environment.</p> <p>Programme 5.1: Enhance the effectiveness of MoA services and affiliated institutions and developing staff capacities.</p>
<p>3. Strengthening the enabling environment for accelerating climate adaptation in water sector in North-Lebanon.</p> <p>3.1.1. Sub-national vulnerability and risk assessment situation</p>	<p>Adaptation priority 1: Strengthen the agricultural sector's resilience to enhance Lebanon's agricultural output in a climate-smart manner.</p> <p>Adaptation priority 3: Structure and develop sustainable water services, including irrigation, in</p>	<p>Pillar 1: Restoring the livelihoods and productive capacities of farmers and Producers.</p> <p>Programme 1.1: Ensure and facilitate access to inputs and tools to maintain agricultural production capacity.</p>

<p>analyzed and updated and scaled up.</p> <p>3.1.2. Climate-proofing financing strategy developed to support NBATs in water sector with a specific focus in North Lebanon.</p>	<p>order to improve people's living conditions.</p>	<p>Programme 1.3: Reduce risk of worsening levels of food and nutrition insecurity.</p> <p>Pillar 5: Strengthening the enabling institutional environment.</p> <p>Programme 5.1: Enhance the effectiveness of MoA services and affiliated institutions and developing staff capacities.</p> <p>Programme 5.3: Enhance sectoral governance to maximize public and private development financing and encourage agricultural investment.</p>
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- E. Describe how the project / programme meets relevant national technical standards, where applicable, such as standards for environmental assessment, building codes, etc., and complies with the Environmental and Social Policy of the Adaptation Fund (AF ESP).

Project alignment with legislative base:

Making certain that the proposed project is in compliance with national level legislation and technical standards on the subject matter is a significant dimension that ensures effective implementation of all relevant safeguards. As a screening exercise, Table 4 presents alignment with: (a) Environment Law 444, (b) Law no 221/2000 on 26/5/2000 (The law on the Organization of the Water Sector), (c) Decree 8471/2012: Environmental compliance of establishment, MoE Decree 52/1 of 1996: National environmental quality standards, and (d) Technical standards of the Urban Planning decree-law of 1983 and requirements of Municipal Law decree 118/77 (Table 4). An initial screening of the Environmental Impact Assessment (EIA) Law in Lebanon vis-a-vis the proposed project's tangible component 1 indicates that an EIA will not be necessary, however the project proposal recognizes necessary compliance with international standards as well. Further analysis is expected to be carried out during preparation of the full proposal in order to identify whether national technical standards provide the project with all tools necessary for compliance with AF ESP and FAO's Environmental and Social Safeguard System and subsequent corrective actions will take place. During the full proposal development process, a comprehensive and detailed Environmental Impact Assessment will be conducted. The EIA will meet both the Adaptation Fund's requirements, in accordance to the Fund's Environmental and Social Policy, Gender Policy, as well as the FAOs Environmental and Social Standards. The assessments will illustrate in detail the national environmental standards in place and indicate how the project will comply with them. FAO will open the results of the ESA at the final stages of stakeholder consultation (validation workshop) and will make certain that it reaches all project-affected people and stakeholders. Table 5 presents an initial overview of the proposed project's compliance with the AF ESP and national level legislation. The full project proposal will describe the manner in which safeguarding measures can complement or strengthen national technical standards and achieve full compliance.

Table 4: Proposed project alignment with relevant national legislation base

Law	Components		
	1. Strengthening climate resilience of coastal environment and farmers' communities through the development of Nature-Based Adaptation Technologies (NBATs) for enhanced and sustainable management of water resources	Increasing adaptive capacity and awareness on water governance sector in North-Lebanon	Strengthening the enabling environment for accelerating climate adaptation in water sector in North-Lebanon
Law No. 444 (on environmental protection)	X	X	X
Law No. 64 (on the protection of the environment against pollution from hazardous waste disposal and substances)	X		
Urban Planning Law: Legislative Decree No. 69 dated 09/09/1983	X		
Law no 221/2000(on the Organization of the Water Sector)	X	X	X
Law 738/2006 (Ratification of the Kyoto protocol) ¹⁰	X	X	X
Law 359/1994 (ratification of the UNFCCC) ¹¹	X	X	X
MoE Decree 52/1 of 1996: National environmental quality standards	X		

¹⁰ Law 738/2006, 2006. viewed 24 Dec 2020, <<http://www.legiliban.ul.edu.lb/Law.aspx?lawId=9122>>

¹¹ Law 359/1994, 1994, viewed 24 Dec. 2020, <<http://www.legiliban.ul.edu.lb/Law.aspx?lawId=8387>>.

Table 5: Project proposal compliance with national environmental laws and AF ESP

Expected Concrete Output/Intervention	Environmental and Social Policy of the Adaptation Fund (AF ESP)	Relevant Rules, Regulations, Standards and Procedures	Compliance procedure and authorizing offices
1.1.1. Outlets of drain network reengineered and connected to collect water for remediation and reuse for agricultural purposes in high-density coastal areas	AF Principle: 1, 2, 3, 4, 5, 6, 8, 9, 12, 13, 14, 15	<p>Environment Law 444 (dated 29/07/2002)</p> <p>Law no 221/2000 on 26/5/2000 Rectified by law no 241/2000 on 7/8/2000 Amended by law no 377 on 14/12/2001 (on the Organization of the Water Sector)</p> <p>Law No. 64 of 1988 on the protection of the environment against pollution from hazardous waste disposal and substances</p> <p>Decree 8471/2012: Environmental compliance of establishments</p> <p>Decree 8633/2012: Fundamentals of EIA</p> <p>MoE Decree 52/1 of 1996: National environmental quality standards</p> <p>The Urban Planning decree-law of 1983</p> <p>Municipal Law decree 118/77</p>	<p>Ministry of Environment</p> <p>Ministry of Energy and Water</p> <p>Ministry of Agriculture</p> <p>Directorate General of Urbanism (DGU)</p> <p>Ministry of Interior and Municipalities</p>
1.1.2. Green phytoremediation infrastructure (vertical constructed wetland) for climate-smart management of water resources constructed at the outlet of collector drain to increase water supply for agricultural production for coastal farm communities	AF Principle: 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15	<p>Environment Law 444 (dated 29/07/2002)</p> <p>Law no 221/2000 on 26/5/2000 Rectified by law no 241/2000 on 7/8/2000 Amended by law no 377 on 14/12/2001 (on the Organization of the Water Sector)</p> <p>Law No. 64 of 1988 on the protection of the environment against pollution from hazardous waste disposal and substances. Decree 8471/2012: Environmental compliance of establishments</p> <p>Decree 8633/2012: Fundamentals of EIA</p> <p>MoE Decree 52/1 of 1996: National environmental quality standards</p> <p>The Urban Planning decree-law of 1983</p>	<p>Ministry of Environment</p> <p>Ministry of Energy and Water</p> <p>Ministry of Agriculture</p> <p>Directorate General of Urbanism (DGU)</p> <p>Ministry of Interior and Municipalities</p>

		Municipal Law decree 118/77	
1.1.3. Augmentation structure developed to reverse water exploitation and saltwater intrusion in coastal areas	AF Principle: 1, 2, 3, 6, 8, 9, 10, 12, 13, 14, 15	Environment Law 444 (dated 29/07/2002) Law no 221/2000 on 26/5/2000 Rectified by law no 241/2000 on 7/8/2000 Amended by law no 377 on 14/12/2001 (on the Organization of the Water Sector) Law No. 64 of 1988 on the protection of the environment against pollution from hazardous waste disposal and substances. Decree 8471/2012: Environmental compliance of establishments Decree 8633/2012: Fundamentals of EIA MoE Decree 52/1 of 1996: National environmental quality standards. The Urban Planning decree-law of 1983 Municipal Law decree 118/77	Ministry of Environment Directorate General of Urbanism (DGU) Ministry of Interior and Municipalities
1.2.1. Monitoring system linked to: (a) Regional Prototype Monitoring System, (b) Weather stations and (c) Early warning mobile application is deployed in pilot farms to control and prevent water exploitation and enhance evidence-based decision-making on water resource management	AF Principle: 1, 9, 10, 11, 14	Law no 221/2000 on 26/5/2000 Rectified by law no 241/2000 on 7/8/2000 Amended by law no 377 on 14/12/2001 (on the Organization of the Water Sector)	Ministry of Energy and Water
1.2.2. E-platform developed to provide access to crowd-sensed water monitoring data	AF Principle: 1, 2, 4, 5	Law no 221/2000 on 26/5/2000 Rectified by law no 241/2000 on 7/8/2000 Amended by law no 377 on 14/12/2001 (on the Organization of the Water Sector)	Ministry of Energy and Water
1.2.3. Capacity-building programme on the use and operation of the monitoring system provided	AF Principle: 1, 2, 3, 4, 5, 6	Law no 221/2000 on 26/5/2000 Rectified by law no 241/2000 on 7/8/2000 Amended by law no 377 on 14/12/2001 (on the Organization of the Water Sector)	Ministry of Energy and Water
2.1.1. Climate adaptation NBATs mapped and assessed with participatory approach set in place	AF Principle: 1, 2, 3, 4, 5, 9, 10, 11, 12, 13, 14, 15	Law no 221/2000 on 26/5/2000 Rectified by law no 241/2000 on 7/8/2000 Amended by law no 377 on 14/12/2001 (on the Organization of the Water Sector)	Ministry of Energy and Water
2.1.2. Guides for policymakers, practitioners, and local farming communities prepared to enhance climate adaptation and mainstream NBATs into planning processes with an explicit focus on the water sector	AF Principle: 1, 2, 3, 4, 5	Environment Law 444 (dated 29/07/2002) Law no 221/2000 on 26/5/2000 Rectified by law no 241/2000 on 7/8/2000 Amended by law no 377 on 14/12/2001 (on the Organization of the Water Sector)	Ministry of Environment Ministry of Energy and Water

		Decree no 118/77 and the municipal laws authorize municipalities to play a leading role in the local planning processes	
2.2.1. Local communities and professionals of competent authorities trained on policy-support tool and on-site demonstrations	AF Principle: 1, 2, 3, 5, 6	Environment Law 444 (dated 29/07/2002)	Ministry of Environment
3.1.1. Sub-national vulnerability and risk assessment situation analyzed and updated and scaled up	AF Principle: 1, 4, 5	Law no 221/2000 on 26/5/2000 Rectified by law no 241/2000 on 7/8/2000 Amended by law no 377 on 14/12/2001 (on the Organization of the Water Sector)	Ministry of Energy and Water
3.1.2. Climate-proofing financing strategy developed to support NBATs in water sector with a specific focus in North Lebanon	AF Principle: 1, 2, 3, 5	Law no 221/2000 on 26/5/2000 Rectified by law no 241/2000 on 7/8/2000 Amended by law no 377 on 14/12/2001 (on the Organization of the Water Sector)	Ministry of Energy and Water

F. Describe if there is duplication of project / programme with other funding sources, if any.

Lebanon is a country with many climate change and water management related projects and initiatives. The proposed concept due to its technical nature and small size will be able to maximize results through synergies with other platforms and also avoid duplication. The proposed project will build on, complement, and augment the results of other projects listed below and also utilize their lessons learned. Initial screening for potential overlaps has not indicated any issue between existing projects and the proposed one in technical, spatial, and/or temporal dimensions. At the stage of full proposal development and consultations, a dialogue with all platforms will be further coordinated to ensure best alignment and screen for more parallel initiatives at regional and global level.

Table 6: Project proposal complementarity and non-duplication overview with parallel project interventions in Lebanon

No	Relevant Projects/ Programme	Description of the project/programme	Goals and Achievements (within/ after the relevant project/program)	Complementary potential and non - duplication	Project Timeline and Budget
1	ACTED program Rainwater Harvesting (RWH) systems in Berqayel Sector: agriculture, municipal needs. Location: Berquael, governorate: Akkar.	The RWH system transfers rooftop rainwater straight to a nearby reservoir which then provides water directly through the household plumbing network.	Low-cost solution for the collection and storage of rainwater for daily use in Akkar. ACTED is continuing its cooperation with the local municipality in an effort to promote the RWH concept beyond Berqayel.	The ACTED project is addressing water scarcity through a different angle. Water and beneficiary data together with lessons learned will be taken into account.	The programme is finished in 2018
2	ACTED "Water is life" program in Akkar district: EU-funded project in collaboration with the North Lebanon Water Establishment (NLWE)	This program aims to gather students from different schools in Akkar and offer them the opportunity to learn from key stakeholders in the water sector about the importance of preserving water.	Increase in subscriptions to the NLWE networks (currently approximately 6% of the population)	Project is small in scale and primarily relates to awareness raising. Our proposed project will work with the "ACTED" platform to investigate if there are active education and training networks that can be utilized for the benefit of the current proposal.	Started on June 2nd, 2017
3	WFP/Renee Moawad Foundation Project "Enhancing the Livelihoods of Vulnerable Lebanese Host Communities and Syrian Refugees through Food Assistance for Assets (FFA) and Complementary Training Activities". Sector: agriculture, Location: Nemrin – Btormaz – Taran	The establishment, improvement, and rehabilitation of a canal network for irrigation in Nemrin – <i>as part of the Food For Assets and Food For Training project</i> , funded by the Federal Ministry of Economic Cooperation and Development of Germany (BMZ), with the support of the World Food Programme (WFP).	Targeting at least 400 beneficiaries who will rehabilitate irrigation canals in Nemrine and Btermaz. Improve access to irrigation water for 225 farmers directly and 1,811 farmers indirectly. Vulnerable communities are empowered to adapt to the impacts of climate change.	The WFP/Renee engages in rehabilitation of irrigation canals to improve the situation with water in the agricultural sector. Best practices in rehabilitation, canals network, training and lessons learned will also be taken into account. The proposed AF project will examine the training material used in order to avoid duplication.	Duration: 15 July 2019 – 31 December 2019. Budget: 440,822 USD

	Caza: Minieh Donnieh. Governorate: North-Lebanon.				
4	UNDP Project “Support to Host Communities in North Lebanon in the WASH Sector	The project is delivering the following: construction or rehabilitation of water collection cisterns, irrigation infrastructure, and rainwater harvesting such as mountain lakes and on-farm improved irrigation systems.	This project creates both short-term job opportunities for vulnerable Lebanese and Syrian workers during the construction or implementation of the works themselves while also increasing longer-term employment potential through the expansion of agricultural lands and increasing production. Vulnerable farming communities are empowered to adapt to the impacts of climate change.	AF project will create synergies with this project to ensure that standards and needs of Host Communities in North Lebanon are shared. UNDP project representation will be invited as a stakeholder in project meetings and the ways for mutual contribution to results will be identified.	Duration: 1 January 2014 - 31 December 2023
5	IUCN Project “Climate Change Resilience in Lebanon Social, Ecological & Agricultural Resilience in the Face of Climate Change (SEARCH)”	The objective of the project is to increase social and ecological resilience in watershed ecosystems of the Mediterranean Region in the face of climate and other drivers of change.	Local communities and professionals of competent authorities trained on policy-support tool and on-site demonstrations. Integrated disaster risk management and strategic planning.	SEARCH recognizes and concentrates on giving the local community in Lebanon and other stakeholders the skills and knowledge needed to assess the impacts of climate change. SEARCH has built some foundation for the proposed AF project and the design of products of Component 2 will take into account the products and lessons learned of SEARCH.	Duration: April 2011 – February 2014)
6	IWMI and USAID Project MENA drought: Tackling drought in Jordan, Lebanon and Morocco	MENA drought is working hand in hand with government officials and policy makers in Morocco, Lebanon and Jordan to deploy various tools to predict, prepare for, respond to and mitigate drought impacts at the country level. The IWMI and USAID project relies on the three-pillars approach of the Integrated Drought Management Program: monitoring and early warning system; vulnerability and impact assessment; mitigation response and preparedness.	In the medium and longer term, the project is expected to have the following impacts: Improved water and food security together with drought resilience in vulnerable communities (and even at the national level) as well as reduced economic losses from drought. More stable rural livelihoods and reduced displacement of individuals living in rural or agriculturally	The MENA drought overlaps thematically with this project on climate risk assessment and mitigation prevention at regional (multi-country) level. The AF project will be more precise in solving issues in North Lebanon. The AF project will take into account all MENA products and tools while designing the activities and products for Components 2 and 3.	Duration: 2018-2021

			dependent communities during drought episodes		
7	USAID/Litany. "Litani river basin management support program (LRBMS)	The LRBMS program was part of USAID's increasing support to the water sector in Lebanon. The purpose of the LRBMS Program was to set the ground for improved, more efficient and sustainable management of the Litani river basin through provision of technical support to the Litani River Authority and implementation of limited small-scale infrastructure activities.	Improved water governance; Improved operations of the Litani River Authority; Development of knowledge and awareness for water users.	Data from water quality, experience from constructed wetland generated under USAID/Litany project will feed into Component 1 of the proposed AF project AF project will examine thoroughly USAID/Litany project products and lessons learned and will build on them.	Duration: 2009 – 2014
8	GEF Mediterranean Pollution Hot Spots Investment Project ¹²	The goals of the project are improving water security, human and ecosystem health, and climate resilience in coastal hot spots.	The project provides investments in coastal hotspots, capacity-building activities to enable the national water and sanitation companies to better operate and maintain wastewater collection and treatment systems	The proposed AF project will work very closely with this initiative. Close collaboration will be ensured to achieve technical and geographical synergies and maximize the effect of parallel interventions in the target areas, especially in terms of management of coastal aquifers which is a component of both projects	February 2020-ongoing Budget: 5.2 million USD
8	GEF(UNEP/MAP) Mediterranean Coastal Zones Climate Resilience Water Security and Habitat Protection	The goals of the project are improving water security, human and ecosystem health, and climate resilience	The projects provides activities to increase resilience to climatic variability and change of coastal populations through the improvement of sustainability of services provided by coastal aquifers and by groundwater-related coastal habitats.	The GEF project activities are defined in different region of the country. FAO can benefit from the potential complementarity of the areas by identifying cooperation and synergies in order to include the best practices and lessons on coastal aquifers protection.	January 2020-ongoing Budget: 7 million USD
9	FAO / Swiss Agency for Development and Cooperation (SDC) project Improved Water Resources	The project aims at providing effective means to monitor water resources in the North Lebanon Water Establishment, and enabling data sharing	Watershed Prototype Monitoring System, Water Accounting Tool, Enhanced informed decision making and data sharing	FAO/SDC project has been delivering results in the sphere of monitoring and collecting data in North Lebanon. The proposed AF project	Duration: 1 July 2017- 30 September 2021. Budget: 2.4 million USD

¹² There are several GEF 7 child projects under way under UNEP/MAP/GEF apart from the already active umbrella programmes in multi-focal areas. FAO at the stage of full proposal will endeavor to liaise with UNEP MAP and create necessary synergies whilst avoiding duplication.

	Monitoring System/ Integrated Water Resources Management at regional level in Lebanon	amongst stakeholders and informed decision transfer to end-users. The project focuses on enhancing the monitoring of water resources in Minieh and Akkar, North Lebanon.		will build on the results by integrating further the monitoring system already in place, augmenting it and generating more access to climate relevant data (Component 1).	
10	IMAP-MPA Project - Towards achieving the Good Environmental Status of the Mediterranean Sea and Coast through an Ecologically Representative and Efficiently Managed and Monitored Network of Marine Protected Areas	It is focused on marine protected areas (biodiversity and non-indigenous species; pollution and marine litter; and hydrography).	The project will strengthen and further develop the Mediterranean network of Marine Protected Areas. It will also support the achievement of good environmental status of the Mediterranean Sea and will assess the progress towards this status.	This project deals with the protection of marine resources, studies the pollution of coastal waters, the state of the marine ecosystem. Component 1 of the proposed project addresses direct discharge of polluted water into the sea. A dialogue channel will be established with IMAP-MPA for the purpose of synergies.	Duration: 2019-2022, Budget: 4 million Euro
11.	GEF project Reducing Pollution from Harmful Chemicals and Wastes in Mediterranean Hot Spots and Measuring Progress to Impacts	It operationalizes priority actions to reduce major transboundary environmental stresses in Mediterranean coastal areas while strengthening climate resilience and water security and improving the health and livelihoods of coastal populations. The project is designed to prevent persistent organic pollutants and mercury in health sector. The project is a child project under the GEF/UN Environment multi-focal area "Mediterranean Sea Programme (MedProgramme): Enhancing Environmental Security. The MedProgramme is structured into three components: reduction of Land-Based Pollution in Priority Coastal Hotspots and measuring progress to impacts; Enhancing Sustainability and Climate Resilience in the Coastal Zone; protecting Marine Biodiversity.	The preparation of mature investments targeting pollution reduction in coastal hotspots; and the regional harmonization of relevant standards.	Synergy potential in technical thematic areas and level regional actions: harmonization of relevant standards, updated wastewater master plans The AF project will take advantage of the regional platform for identification of solutions, best practices, networks and other potential synergies, as the GEF project does work on coastal aquifers but in other areas in Lebanon.	Duration: 22 Jan 2020–ongoing Budget: 14.55 million USD
12	Nationally Determined Contribution Support	The project aims at mainstreaming gender in climate change plans across sectors;	Updating Lebanon's (NDC) 2020, with an enhanced adaptation section and	The project mainstreams climate change in sectoral policies at the	The project ends in 2021.

	Programme (NDCSP)	developing incentives to improve the implementation of the NDC and finding synergies with the SDGs	coordinating the integration of climate change in sectoral plans and projects	national level such as the agriculture and water and builds capacities of main institutions to design and implement adaptation measures. However, the project lacks implementation of measures on national or subnational levels.	
13	UNDP Climate promise	The initiative supports the review and update of the NDC targets, and establish a transparency framework for tracking implementation progress.	The initiative climate-proofed the CEDRE capital investment plans and Lebanon's economic vision. it also developed a methodology to climate-proof future plans of central or local governments.	The project provides synergies with the AF project in terms of strengthening climate governance and creating the enabling environment to accelerate implementation of NDC, including the adaption component	The project ends in 2021.

G. If applicable, describe the learning and knowledge management component to capture and disseminate lessons learned.

Component 1 sets out to develop and pilot-test a Nature Based Adaptation Solution for the critical water sector in North Lebanon. This will be complemented by an upgraded water monitoring system and an e-platform for better access to data. This is the main component of the project and is seen as the cornerstone for recording and disseminating knowledge in different forms and at different levels.

Components 2 and 3 are seen as more straightforward in terms of knowledge management and character of lessons learned as they are by nature primarily knowledge generating and their results are direct knowledge products.

The lessons to be drawn from the project are relevant beyond specific national, sub-national and sector dimensions (Lebanon, Akkar and El-Minieh, Water Sector respectively), as the project will produce actual blueprints for the participatory identification, development and application for NBATs as solutions together with the multi-level capacities necessary and the enabling environment for further financing. The good practices developed in the framework of the proposed project will be elevated to work across programmes, regions, sectors, and countries. Please see Table 7 below for a concise overview of how the proposed project intends to shape its learning and knowledge management component.

Table 7: Overview of the knowledge management component of the proposed project

Expected Concrete Outputs	Learning objectives (LO) and indicators (I)	Knowledge products
1.1.1. Outlets of drain network reengineered and connected to collect water for remediation and reuse for agricultural purposes in high-density coastal areas.	LO: Train professionals on performance assessment of irrigation systems to establish rehabilitation/modernization plans consistent with water use efficiency, sustainability and financial objectives I: Number of professionals	Assessment report and rehabilitation plan based on Rapid Appraisal Procedure/ National training for professionals on Rapid Appraisal Procedure of irrigation infrastructure

1.1.2. Green phytoremediation infrastructure (vertical constructed wetland) for climate-smart management of water resources constructed at the outlet of collector drain to increase water supply for agricultural production for coastal farm communities.	LO: Showcase of part of NBAT for upscale and replication I: pilot application	Model / field guide on green technologies in water sector for climate change adaptation
1.1.3. Augmentation structure developed to reverse water exploitation and saltwater intrusion in coastal areas.	LO: Train professionals on evidence-based assessment on aquifer potential I: Number of potentials	Aquifer potential map/ Repository of aquifer potential studies (potentiometric surface map, drainage density, water table depth, geomorphology, soil, rainfall, land-use/land cover)
1.2.1. Monitoring system linked to: (a) Regional Prototype Monitoring System, (b) Weather stations and (c) Early warning mobile application is deployed in pilot farms to control and prevent water exploitation and enhance evidence-based decision-making on water resource management.	LO: To enhance capacities at farm-level to monitor quality and scarcity I: Integrated monitoring system, Number of subscribers	Training tutorial on EWS integrated into mobile application
1.2.2. E-platform developed to provide access to crowd-sensed water monitoring data	LO: To enhance access to climate related information I: Number of entities and individuals with access to e-platform	Training tutorial on E-platform use
1.2.3. Capacity-building programme on the use and operation of the monitoring system provided.	LO: To enhance capacities to use and operate the monitoring system I: Number of individuals trained (disaggregated by gender)	Operation and Maintenance protocol of Regional Prototype Monitoring System
2.1.1. Climate adaptation NBATs mapped and assessed with participatory approach set in place.	LO: To raise awareness on NBAT selection and assessment I: Number of NBATs mapped and assessed through participatory approach	Document on participatory process on mapping and assessment of NBATs
2.1.2. Guides for policymakers, practitioners, and local farming communities prepared to enhance climate adaptation and mainstream NBATs into planning processes with an explicit focus on the water sector	LO: To enhance multi-level capacities in mainstreaming NBATs into planning processes I: Number of guides delivered	Guides for mainstreaming NBATs into planning
2.2.1. Local communities and professionals of competent authorities trained on policy-support tool and on-site demonstrations	LO: To enhance capacities on use of guides I: Number of individuals trained (disaggregated by gender)	Training material
3.1.1. Sub-national vulnerability and risk assessment situation analyzed and updated and scaled up.	LO: To create knowledge base on the current status of climate vulnerability and risk I: Number of dissemination activities	Climate vulnerability and risk assessment report
3.1.2. Climate-proofing financing strategy developed to support NBATs in water sector with a specific focus in North Lebanon.	LO: To increase specific knowledge on how to fund NBATs	Financing strategy document

	I: Number of dissemination activities (within project duration), number of new NBATs approved for funding (post project)	
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H. Describe the consultative process, including the list of stakeholders consulted, undertaken during project preparation, with particular reference to vulnerable groups, including gender considerations, in compliance with the Environmental and Social Policy of the Adaptation Fund.

This concept note has been developed on the basis of consultation activities: these were of two distinct types (a) bilateral consultations and (b) an open project consultation workshop. As far as the bilateral consultations are concerned a team of FAO as Multilateral Implementing Entity (MIE) was put in place at both international and national levels. Due to the Covid-19 pandemic and the restrictions on travel a scoping mission could not take place in order to meet physically with the potential project partners. Instead, FAO Lebanon kept an open channel with the DA and other executing partners in order to collectively understand the needs of the country and shape the components of the proposed project around those exact needs. Prior to the open project consultation, bilateral discussion was initiated between FAO Lebanon and DA to delineate the fields of interest and seek for strategic guidance related to national climate change adaptation. In response, key published documents were exchanged to support formulation. Once FAO and executive government partners reached consensus on the technical directions and the specific components of the proposed project FAO Lebanon arranged for an open consultation workshop which included representatives from all government entities that hold a stake.

The presentations resulted in a number of questions on and further discussions on an array of pertinent issues in the technical, methodological, financial, and capacity domains such as: (a) land acquisition issues for the application of the solution, (b) direct support to the agricultural communities, (c) new valuable technical material such as the draft 2020 updated NDC, (d) collaboration between agencies and allocation of responsibilities within the proposed project framework, (e) collaboration between different project platforms. All comments in the discussions were taken into account for the development of the current concept and will be further elaborated at the stage of full project proposal. In this regard, the workshop reached consensus and validated the importance of the proposed components. MoE as the DA provided significant inputs on the final draft of the proposed project concept which were duly incorporated prior to submission.

Gender-balanced participation was remarkable for Lebanon with more than a third of attendees being women. Consultations targeting (a) all beneficiary groups including focus groups with women and youth and (b) identification of potential environmental and social risks (Part II, section K) will be conducted during the full project proposal development phase and to the extent possible, with a hope of Covid-19 recess, will be carried out through regular missions to North Lebanon. Please refer to Annex 5 for the official list of participants in the project consultation workshop.

I. Provide justification for funding requested, focusing on the full cost of adaptation reasoning.

The proposed project components, outcomes and outputs fully align with national government policies and institutional priorities and gaps identified, with a clear and direct response to the needs of the interface of the water sector and climate change adaptation as these are identified in the 2020 INDC and the 2020 National Agriculture Strategy. The components, outcomes and outputs also align with the needs of identified communities and vulnerable groups and with the AF outcomes. This alignment has

resulted in the design of a comprehensive approach to develop solutions for addressing climate related water scarcity issues in a climate vulnerable state.

The need for concrete adaptation actions in the water sector in Akkar and El-Minieh focusing on the most vulnerable groups is rather imperative, since these areas are not only extremely vulnerable in terms of climate security, but also a longer-than-temporary home to significant numbers of refugees. Livelihoods are very dependent on the agricultural sector with access to quality water for irrigation and sanitation is very limited even in current baseline circumstances.

Development of solutions is crucial for the coastal areas of North Lebanon to cope with current and future climate change impacts exacerbated through the lens of the refugee crisis. As mentioned earlier, the target areas were selected because of a combination of existing and projected climate change-related water challenges. Significant preceding work in the areas in terms of water monitoring makes them ideal for this project to build on and advance their resilience through NBATs and the enabling environment around them. Please refer to below Table 8 for a concise presentation of the baseline vs alternative scenarios.

Table 8: Baseline and project alternative scenarios

Outcomes	Baseline situation	Alternative (Additional with AF) intervention	Alternative (non-project) scenario
<p>1.1 Access to and management of sustainable water resources</p> <p>1.2. Vulnerable farming communities are empowered to adapt to the impacts of climate change through crowdsensing-based water monitoring</p>	<p>In Lebanon water is managed by specific Water Establishments. In North Lebanon climate change, long time of non-sustainable management and the refugee crisis put tremendous pressure on water resources both in terms of quality and availability/scarcity. Water is key to climate change adaptation and food security in the country, however, the communities of the most vulnerable regions do not have any control over water management, planning or even access to knowledge about the sector. Water is non-sustainably managed and the quality of irrigation water is at very low levels in joint canals with waste and sewage directly discharged to the sea. In terms of environmental issues there is salinization of groundwater and soil resources in the coastal areas with a high degree of general erosion.</p>	<p>Access to and availability of quality water is increased together with the overall management of water resources</p> <p>Farmers and government have the ability to identify and implement Nature Based Adaptation Technologies in the water sector also monitor and address the significant environmental and climate change issues in the target areas - with a potential to upscale and replicate</p> <p>Conflicts over water resources cease and water related health and food security issues decrease</p>	<p>Water resources remain non-sustainably managed. Water canals remain the same for multiple uses such as irrigation and sewage with direct discharge to the sea.</p> <p>Farmers are without access to quality water for irrigation which decreases in availability anyway because of climate change, with significant impacts on yields and quality of important crops</p> <p>Competition over increasingly scarce water resources intensifies generating local conflicts and health issues</p>
<p>2.1 Inclusive policy support tool for multiple stakeholders is developed and validated to enhance NBAT mainstreaming in water governance sector in North-Lebanon</p> <p>2.2. Guides for policymakers, practitioners, and local farming communities prepared to</p>	<p>NBATs are not usual solutions in Lebanon, in the region, or for that matter globally. Multi-level stakeholders have very low awareness and capacity on how to utilize NBATs and more specifically in terms of planning for the critical water sector in the frame of climate adaptation.</p>	<p>With the project NBATs will not be only developed and pilot-tested (Component 1), but they will also be embedded in the planning environment of the country in an inclusive multi-stakeholder pattern through specific products that will support their identification and development to enhance</p>	<p>Nature Based Solutions or in the case of the proposed project NBATs are not developed and pilot tested in general or specifically for the water sector in Lebanon, thus depriving the country of the potential to identify, plan for, and implement cost-effective and sustainable solutions for</p>

enhance climate adaptation and mainstream NBATs into planning processes with an explicit focus on the water sector		climate change adaptation. Component 2 through its outcomes is actually generating blueprints for the replication and upscale of NBATs	climate adaptation in an inclusive and participatory manner. Lebanon also loses the potential to become a leader in the discussion of Nature Based Adaptation.
3.1 Climate-proofing financing to support climate adaptation is strengthened	One of the clear barriers for increasing the climate resilience of environment and communities is financing as stipulated in the sets of policy and legal documents reviewed to support this project proposal. Environmental financing in Lebanon comes from top-down structured Official Development Assistance and a System of National Accounts that does not actively incorporate natural capital	With the project the country will benefit from the NBAT pilot in North Lebanon and generate a financing strategy with a focus on NBATs in the Water Sector for climate resilience, the first one of its kind that can act as a blueprint for expanding to other regions and sectors and can critically initiate, apart from actual financing, a chain-reaction of structuring environmental finance both national and international	Climate adaptation interventions in Lebanon are continuously dispersed either ad-hoc or at the discretion of structured top-down funding frameworks without any overarching strategic planning or financing strategy

J. Describe how the sustainability of the project/programme outcomes has been taken into account when designing the project / programme.

At the current concept note development stage, the proposed project approaches the notion of sustainability in four distinct dimensions.

Environmental sustainability is hereby addressed through the long-lasting environmental impacts that the NBAT will bring as a solution for the water sector in a climate adaptation context. The proposed intervention is characterized by low initial investment, long lifespan and basic maintenance. It achieves continuous benefits for the environment such as better quality of water, groundwater discharge, pollution decrease, slowing down groundwater and soil salinization processes. Constructed wetlands can be dynamically developed in course of time, in particular, if the successful technology implementation is to be scaled-up to further areas including inland and coastal areas. As each phase of the constructed wetland can be used and recycled, no harmful emission is expected: biomass production for renewable energy, soil changed for industrial purposes to avoid displacement of contaminated soil in the environment.

Socio-economic sustainability is addressed by the concept through the social benefits that the solution will bring due to its nature such as a decrease of disagreement and conflicts around a scarce resource together with health benefits and financial sustainability benefits for the farming communities of the target areas, thus, a positive impact on the livelihoods and the overall economy and food security of North Lebanon including for vulnerable groups and refugees. Based on experiences, well maintained wetland can last up to 60 – 70 years without any need for significant re-investment. Managing the wetland in participatory approaches can provide additional job for vulnerable groups, thus making O&M self-financing.

Institutional sustainability is also seriously taken into account in the design of the current project proposal as components 2 and 3 are initiating incorporation of solutions such as the proposed one into the policy domain together with targeted capacity building at the level of communities and institutions, starting at the local level, but with tangible potential to expand across borders and sectors. Component 2 will be working on the policy, capacity, and awareness interface of NBATs for climate change adaptation through the water sector as an entry point in Lebanon. The proposed “support tool for multi-

level stakeholders” will be designed to act as a knowledge base for informed policy reform¹³ and galvanize argumentation for the necessity of reforms as such at the policy level in order to accelerate climate adaptation efforts primarily locally but also nationally and regionally. The proposed tool, in line with consideration stemming from consultations with executing partners, will be designed as a policy resource through which to develop the foundations and the work of the institutional discourse on climate adaptation. The tool, therefore, is not implying policy reform work, and will not require additional capacities and funding from government agencies, as confirmed during the consultation meetings.

Component 3 will endeavor to address the financing side of such adaptation solutions. The two components although distinct in nature and activities will be designed to work in an integrated manner to catalyze successful mainstreaming of solutions as such through awareness raising, capacity development, and soft-policy interventions (component 2) followed by the generation of funding opportunities (financing strategy – component 3). In that sense the combination of the components as manifested by the integration of the project products will provide a blueprint for replication and upscale of similar interventions by the national institutions themselves and with proper super-national communication and outreach this can spill over as a positive effect to other institutions in the region, but also globally.

Overall sustainability of project results is seen not only the way the project intervention is built through a participatory process, but also that participatory and inclusive processes are an overarching dimension for the identification, the design, and the implementation of climate adaptation and resilience enhancing solutions. The combination of top-down and bottom-up together with inclusion of government, communities, vulnerable populations, youth and women as will be initiated in the phase of full project development will kick-start a participatory process that will continuously increase ownership of the project and its products by multi-level actors, hence, increase the sustainability of project results.

K. Provide an overview of the environmental and social impacts and risks identified as being relevant to the project / programme.

The project is conceptualized and will be fully designed to have a positive environmental and social impact, based on data and synergies with products from other projects, as well as through extensive consultations with stakeholders, target communities, and relevant authorities. The rather small-scale appropriate activities will be selected by communities and are expected to create an overall positive impact on the environment with special attention to minimize any collateral environmental effects and they will be designed in this manner.

The entire project at concept note level was assessed for environmental and social risks under the 15 principles set out in the AF ESP. The potential risks were identified together with the needs for further assessment as presented in Annex 4. An initial pre-assessment at concept note stage would classify the project in Category B (project with minimal risks), however this remains to be further clarified during the full ESA at the stage of full proposal development.

The pilot roll out of the NBAT is not anticipated to bear any potential risks in terms of occurrence of contaminants and heavy metals as the produced biomass has a multiple application potential, which can be mainstreamed into a recycling process. The wetland operation will be monitored directly by NLWE laboratories in order to avoid the accumulation of contaminants. As mentioned in section G on

¹³ The project proposal team has been initially considering to pursue actual policy reform work, however, consultations with executing partners vis-à-vis the remaining resources resulted in proposing the foundations for policy work.

learning and knowledge management, a model/field guide of green technologies will be developed including the O&M plan of the wetland. The plan will include a step-wise method on “reuse-repair-dispose” of the biomass, as well as the process flow of the possible usage scenarios. Water and tissue analysis will be executed in addition to applying the principle of "reuse-repair-dispose". More specifically, higher concentrations of heavy metals is deemed highly unlikely because (a) there is no such industry in the region, (b) the soils are predominantly calcareous (contains free CaCO₃ and pH =8) with characteristic precipitation of significant amounts of heavy metals in case of presence in water, making them unavailable for plant uptake, and (c) results of water analysis for Naher El Bared showed that contents of water with heavy metals are not a problem from the source till Minieh and Akkar. In terms of risks recharging with water containing other contaminants, a rapid on-site monitoring component is inherent in the proposed system to act as environment safeguard. Based on up-to-date results of the current water quality monitoring system, final wetland design will also consider the most efficient contaminants – above all organics – removal mechanism (e.g. sedimentation, oxidation, controlled natural die off, biocides etc.) to maximize the treatment effect. The full project proposal will include a multicriteria analysis of the plant selection and wetland design, and demonstrate the environmental safeguards integrated in the wetland management.

The products within the framework of Component 2 and Component 3 include studies, and soft level interventions such as capacity building and augmentation and production of climate information for communities. These activities will not produce any environmental impact. A participatory approach will be applied to improve water supply and irrigation services that will ensure the needs of farmers, men and women and vulnerable groups. The interests of all groups will be taken into account. Please find below an initial gender assessment covering to the extent possible the proposed concept.

Gender baseline

According to the global gender gap index (2020) Lebanon is placed at 145th position having score of 0.599. The same 2020 index highlighted a major discrepancy in gender equality in Lebanon: Although women have almost the same rate of literacy and participation in professional and technical work areas as men, the differences in estimated earned income, labor force participation and role in legislation and management are striking. Men have four-fold higher earned income, three-fold higher labor force participation and ten-fold higher role in legislation and management. National legislation provides women and men with equal rights in regard to ownership, access to loans and banking facilities, and inheritance. However, rural women lack awareness of their rights, and discrimination is still very common, especially in regard to credit and inheritance. Legal provisions on employment in the agricultural sector are inadequate for both men and women. In addition, the National Social Security Fund that provides health and maternity insurance, end-of-service indemnity, and family and education allowances, covers only permanent agricultural employees. Since most of the women employed in agriculture are on part-time basis, and increasingly frequently as daily workers, the national social protection system only partly extends to them. This is particularly important in the context of the target area, whereas 70 percent of the agricultural operations (from land preparation to harvesting) are carried out by hired men and women. The assessment showed that education takes the largest share in household expenses in the target area. In fact, women have a prominent position in education in Lebanon, while the enrolment in primary and secondary education is almost at the same rate for men and women, women outperform men in enrolment in tertiary education accounting for 46 percent of women enrolled in tertiary education compared to the 40 percent for men. The achievement of Lebanese women in education shows a positive trend. However, access to education much depends on the wealth and status of the family. Vulnerabilities, such as low-income or refugee status is a major obstacle to women to gain skills.

Gender differences in agriculture

In Lebanon, women farmers account for about nine percent of the total population. However, women's involvement shows regional disparities. Akkar in North-Lebanon is one of the country's high-priority agricultural areas, thus holding the potential of more equitable women involvement in agriculture and benefits generated by the project. Agriculture is the main economic activity in Akkar with 28,092 registered agricultural operators which employ a significant part of the local population (22 percent of male and 27.3 percent of the female working force). However, Akkar is also one of the most deprived areas shaped by economic hardship, social challenges and recently climate change impacts. A recently conducted assessment by FAO in Akkar reinforced the general gender disparity identified in country-level gender assessment. The assessment measured the gender wise difference in household income level in the target area (Akkar region). The results showed that men dominate in having hold of household income in agriculture (crop and livestock). Although the tasks related to farming are usually shared in the families, men still have significantly higher income levels compared to women. The assessment showed that women can generate income higher than men only in non-farm activities, thus signaling a potential crowd-out of women from the agriculture sector. Gender-wise only three percent of the females have land ownership in the target areas, i.e. the cases where there are no male family members in the household due to death/divorce. The situation is even worse in women groups with multiple vulnerabilities. Agriculture is a major mainstay of the Syrian refugees hosted by the region. Refugee women are involved into the daily field works (sowing, transplanting, harvesting, etc.). Having weak legal status and being exposed to the shocks of agricultural sector, empowering women with multiple vulnerability is of utmost urgency. Another group with multiple vulnerability is the young women. 72 percent of the total unemployed in Akkar are among people aged 15-29 years, of which 75.9 percent unemployed is women. In the range of 20-29 years, women constitute 63.3 percent of total unemployed, compared to 48.1 percent for males. This alerting difference indicates a potential outflux of young women from agricultural sector, and in general from the region. However, Akkar is characterized by high-value crop production, including citrus and fruit trees, increasing greenhouse production (eggplant, zucchini, tomato, cucumber and other vegetables) that require substantial labor force. This is particularly promising, since women are the primary labor force in agriculture, and largely responsible for seasonal agricultural activities such as sowing, weeding, and harvesting fruits and vegetables. Men are primarily responsible for handling heavy machinery, greenhouse construction and transporting crops (El Gazzar/ILO, 2015, p. 14). The diversified cropping pattern in Akkar is also advantageous in the sense that the peak periods requiring labor force (land preparation, sowing, transplanting, fertilizing, harvesting, etc.) can be evenly distributed over the season, thus allowing a more-or-less balanced and continuous demand for labor force. As agricultural operations are mostly done by hired labor, this could provide a relative stability for hired women. The positive trend of shifting to cash-crops profitable also in small-scale holdings, however, must be supported by increased productivity of agricultural sector, more efficient use of sharply degrading natural resources, improved knowledge of agricultural employees. The project has significant merit in agricultural development through augmentation of water resources and option of safe water reuse, beneficial for women. This will have a stabilizing effect on agriculture while promoting a sustainable balance between agricultural water use and ecosystem functions (both inland and marine).

Gender implication of degrading environment

Women are in the frontline of suffering from deteriorating environment. The FAO assessment in the target area highlighted that women own medium/poor quality lands compared to men. The severe soil erosion is due to the inadequate agricultural practices, the interference with urbanization, the lack of soil fertility plan and climate induced erosion. Another major issue is the bad quality of irrigation water accumulating fecal contamination due to improper sewage discharge practices. The FAO assessment

revealed that about 87 percent of the farmers reported that over the years the land and water pollution has increased. Women hold most of the domestic responsibility, such as cleaning, cooking, washing. The current water distribution system is a major drawback of environmentally, as irrigation canals carrying sewage-polluted water run through the villages and directly surround the houses. It is estimated that around 45 km stretch of main and lower level open canals are directly embedded in the urban landscape in the target area. Consequently, women are severely exposed to the health consequences of such environment, while carrying-out the daily household responsibilities. Another major concern is the direct contact with polluted water during the agricultural works. Open-crop fields and orchards are often managed with surface irrigation technique, thus leaving contamination on the leaves. Women taking the major share of harvesting activities are exposed to the pollutants. The project will roll out an NBAT as a solution with high potential to promote a greener and healthier landscape of agricultural areas. Such a pilot will have a substantial role in making the environment more healthy, thus enhancing women's livelihood.

Gender differences aggravated by climate change

The lack of climate change adaptation has direct impact on women. The FAO assessment highlighted that on average 0.3 hectare land is left fallow due to water shortage. This can be considered a significant number, since the land parcel size averages 1-4 ha with skewed distribution toward smaller land sizes. 87 percent of the reported water scarcity occurs in summer season. The gender wise difference indicates that women farmers face more water scarcity by 12 percent compared to men. 97 percent of responding farmers indicated increased irrigation demand due to climate change impact, 59 percent experienced drought in the last 10 years, 96.2 percent perceived increasing temperature and 77.1 percent reported a shift in the rainy season. Each response was related to climate change. Such perceived climate change impact has multiple implications on women, as the assessment study revealed a substantial gap between men and women regarding adoption of drought management practices, whereas men have adopted more as compared to women. In scarce period, farmers consider groundwater an alternative water resource in coastal areas, thus elevating the risk of salinization-induced land loss. Women, in particular the hired labor, are exposed to it, as any land loss is translated to loss of jobs. As climate change impact can be adapted only at farm management level, women employed in daily work and directed by farm owners have practically no means to mitigate the production risks. The project will provide multiple benefits to release the burden on women. Through water resource augmentation, the project can remedy the production loss coming from water scarcity. Through the climate monitoring system, the project can provide an equitable information system accessible to vulnerable groups.

Risks as per the ESP process

In terms of access and equity and gender equity and women's empowerment the proposed concept is estimated to bear a low risk. At the stages of full proposal development and project operation there will be neither discrimination nor favoritism in the decision-making process and in terms of access to project products for men and women, vulnerable and marginalized groups. Any conflict that may arise will be addressed and resolved promptly on a legislative basis. The full consultative process will be carried out with the participation of gender experts to ensure that the proposed AF project is responsive to various gender needs and roles such that project activities effectively respond to the unique needs of women and men and promote equal opportunities to participate, and receive comparable social, health and economic benefits. Specifically, in light of higher ownership of low quality land and exposure to environment degradation and their increased exposure to water scarcity, the project will actively endeavor to include these marginal percentages in the consultative process and the set of discussions

not only to ensure gender sensitivity of the project itself but to actively empower these women stakeholders and contribute in closing these exact gender gaps that were identified in this initial analysis.

The table below provides an overview of the environmental and social impacts and risks identified as being relevant to the project and Annex 4 contains the assessment in finer detail.

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
<i>Compliance with the Law</i>		X
<i>Access and Equity</i>		X
<i>Marginalized and Vulnerable Groups</i>		X
<i>Human Rights</i>		X
<i>Gender Equity and Women’s Empowerment</i>		X
<i>Core Labour Rights</i>		X
<i>Indigenous Peoples</i>	X	
<i>Involuntary Resettlement</i>		X
<i>Protection of Natural Habitats</i>		X
<i>Conservation of Biological Diversity</i>		X
<i>Climate Change</i>		X
<i>Pollution Prevention and Resource Efficiency</i>		X
<i>Public Health</i>		X
<i>Physical and Cultural Heritage</i>		X
<i>Lands and Soil Conservation</i>		X

PART IV: ENDORSEMENT BY GOVERNMENT AND CERTIFICATION BY THE IMPLEMENTING ENTITY

A. Record of endorsement on behalf of the government¹⁴

<i>H.E. Mr. Dimyanos Kalttar</i> <i>Minister</i> <i>Ministry of Environment</i>	Date: <i>January, 18, 2021</i>
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¹⁴. Each Party shall designate and communicate to the secretariat the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.



REPUBLIC OF LEBANON
MINISTRY OF ENVIRONMENT

Beirut, 26/1/2021
Our Ref: 171/B/2021

THE MINISTER

The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5

Subject: Endorsement for project: "Enhancing water sector resilience through nature-based adaptation technologies in North-Lebanon"

In its capacity as Designated Authority for the Adaptation Fund (AF) in Lebanon, the Ministry of Environment (MoE) confirms that the above national project concept proposal is in accordance with the government's priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in Lebanon. The project also aligns with Lebanon's Nationally Determined Contributions (NDC) and was discussed with relevant stakeholders.

Accordingly, the Ministry is pleased to endorse the above project concept proposal with support from the Adaptation Fund. If approved, the project proposal will be prepared and implemented by the Food and Agriculture Organization (FAO). The Ministry requests FAO to provide a copy of the project proposal document before it is submitted to the AF Secretariat for endorsement.

The total grant financing from the Adaptation Fund being requested in this national project is 2,139,175 USD, inclusive of project preparation, if any, and agency fees for project cycle management services associated with the total grant. The grant financing requested for Lebanon is detailed in the table below:

Source of Funds	Implementing Entity	Amount in (US\$)			
		Project preparation	Project	Fee	Total
Adaptation fund	FAO	0	1,957,345	181,830	2,139,175

Sincerely yours,



Djananos Kattar
Minister of Environment



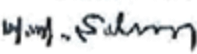
Attached: - Concept project proposal to the Adaptation Fund
Cc: - FAO
- Ministry of Energy and Water; Minister and North Lebanon Water Establishment
- MoE- DGoE - Registrar - Department of Public Relations and External Affairs
- MoE- DGoE - Service of Environmental Technology/ UNFCCC Focal Point
- MoE- DGoE - Service of Environmental Technology - Department of Air Quality
- MoE - Climate Change Projects

AA-F-16-V-1-111

Ministry of Environment, Lazariéh Center, 8th Floor, Block A-4 New
P.O.Box: 11/2727: Beirut-Lebanon. Tel: +(961)-1-976555 or 4-Digit Number: 1789: Fax: +(961)-1-976534

B. Implementing Entity certification

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans and subject to the approval by the Adaptation Fund Board, commit to implementing the project/programme in compliance with the Environmental and Social Policy of the Adaptation Fund and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.

Maher Salman	
Implementing Entity Coordinator 	
Date: February, 17, 2021	Tel. and email: 0039 0657054718 Maher.Salman@fao.org
Project Contact Person: Maher Salman	
Tel. And Email: 0039 0657054718; Maher.Salman@fao.org	

ANNEX 1: LIST OF REFERENCES

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ANNEX 2: ALIGNMENT OF PROPOSED PROJECT OUTPUTS WITH THE 2020 NATIONAL AGRICULTURE STRATEGY

NAS Priority Actions	Project Component/Output
Pillar 1: Restoring the livelihoods and productive capacities of farmers and producers.	Component 1. Outputs 1.1.1, 1.1.2, 1.1.3 are expected to restore productive capacities of farmers in the coastal regions of Akkar and El-Minieh. Component 3. Outputs 3.1.1, 3.1.2 will help to adapt to climate changes in the water sector.
Pillar 2: Increasing agricultural production and productivity	Component 1. Outputs 1.1.1, 1.1.2, 1.1.3 will increase agricultural production and productivity. Outputs 1.2.1, 1.2.2, 1.2.3 will provide the agricultural sector with relevant data of water quality. Component 2. Outputs 2.1.1, 2.1.2 will provide mapping and assessment of NBATs, guides for mainstreaming NBATs into planning.
Pillar 4: Improving climate change adaptation and sustainable management of agri-food systems and natural resources	Component 1. Outputs 1.1.1, 1.1.2, 1.1.3 will lead to improving climate change adaptation via practical activities (green phytoremediation, reengineering outlets of drain network to collect water for remediation and reuse for agricultural purposes, developing of augmentation structure to reverse water exploitation and saltwater intrusion in coastal areas). Component 2 will help to improve climate change adaptation via climate adaptation NBATs in the Output 2.1.1.
Pillar 5: Strengthening the enabling institutional environment	Component 1 Outputs 1.2.1, 1.2.2, 1.2.3. will provide an integrated monitoring system for quality and scarcity of water resources. Component 2. Outputs 2.1.2 will help to increase adaptive capacity and awareness on water governance sector in North-Lebanon Component 3. Outputs 3.1.1, 3.1.2 will provide climate vulnerability and risk assessment report and financing strategy.

ANNEX 3: ALIGNMENT OF PROJECT OUTPUTS WITH KEY NATIONAL LEGISLATION AND THE AF ESP

Expected Concrete Output/Intervention	Environmental and Social Policy of the Adaptation Fund (AF ESP)	Relevant Rules, Regulations, Standards and Procedures	Compliance procedure and authorizing offices
<p>1.1.1. Outlets of drain network reengineered and connected to collect water for remediation and reuse for agricultural purposes in high-density coastal areas.</p>	<p>AF Principle: 1, 2, 3, 4, 5, 6, 8, 9, 12, 13, 14, 15.</p>	<p>Environment Law 444 (dated 29/07/2002)¹⁵ Principle 5 Prevention of natural resources degradation;</p> <p>Law no 221/2000 on 26/5/2000 ¹⁶ Rectified by law no 241/2000 on 7/8/2000 Amended by law no 377 on 14/12/2001 Article 1: The protection and development of the water natural resource, within the framework of the preservation of the environment and the balances of nature, are considered as the essence of public benefit;</p> <p>Law No. 64 of 1988 on the protection of the environment against pollution from hazardous waste disposal and substances¹⁷;</p> <p>Decree 8471/2012: Environmental compliance of establishments¹⁸; Decree 8633/2012: Fundamentals of EIA¹⁹ ; MoE Decree 52/1 of 1996: National environmental quality standards²⁰; The Urban Planning decree-law of 1983²¹ : ▪ Article 4 to 17: plans, regulations and relevant planning conditions and possibilities. ▪ Article 18 to 24: operational arrangements that governments can use when undertaking a development project. ▪ Article 25 to 44: building permits and land subdivision;</p> <p>Municipal Law decree 118/77²² : ▪ Article 49: an urban plan should be approved jointly by the Directorate General of Urbanism (DGU) and the concerned municipality.</p>	<p>Ministry of Environment Ministry of Energy and Water Ministry of Agriculture Directorate General of Urbanism (DGU) Ministry of Interior and Municipalities</p>

¹⁵ Karim El-Jsir, Capricia Chabarekh, 2012. “National report to the United Nations Conference on Sustainable development (RIO+2020), Sustainable Development in Lebanon: Status and Vision”, viewed 24 Dec. 2020, <<https://www.un.org.lb/Library/Assets/2012-National-Report-Lebanon-Rio20.pdf>>.

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¹⁷ Law No. 64 of 1988 on the protection of the environment against pollution from hazardous waste disposal and substances, 1988, viewed 24 Dec. 2020, <<http://www.legiliban.ul.edu.lb/LawArticles.aspx?LawTreeSectionID=245620&LawID=244381&language=ar>>.

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¹⁹ Decree 8633/2012: Fundamentals of EIA, 2012, viewed 24 Dec. 2020, <<http://www.undp.org.lb/stores/profiles/vacatt/1465.pdf>>

²⁰ MoE Decree 52/1 of 1996, viewed 25 Dec 2020, <http://lepap.moe.gov.lb/sites/default/themes/Decision%2052-1_0.pdf>

²¹ ALNAP, 2013, “Reforming urban planning system in Lebanon”, Findings of the research/assessment, viewed 24 Dec. 2020, <<http://www.alnap.org/system/files/content/resource/files/main/reforming-urban-planning-system-in-lebanon-e.pdf>>.

²² Government of Lebanon Ministry Interior and Municipalities, 2009. Municipal act “Decree-law no. 118 Dated 30/6/1977 & its amendments”, viewed 25 Dec. 2020 <https://www.pseau.org/outils/ouvrages/Ministry_of_interior_and_municipalities_1977.pdf>.

<p>1.1.2. Green phytoremediation infrastructure (vertical constructed wetland) for climate-smart management of water resources constructed at the outlet of collector drain to increase water supply for agricultural production for coastal farm communities.</p>	<p>AF Principle: 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15,</p>	<p>Environment Law 444 (dated 29/07/2002) Principle 5 Prevention of natural resources degradation; P.23-RD Law no 221/2000 on 26/5/2000 Rectified by law no 241/2000 on 7/8/2000 Amended by law no 377 on 14/12/2001 ▪ Article 1: The protection and development of the water natural resource, within the framework of the preservation of the environment and the balances of nature, are considered as the essence of public benefit. Law No. 64 of 1988 on the protection of the environment against pollution from hazardous waste disposal and substances; Decree 8471/2012: Environmental compliance of establishments Decree 8633/2012: Fundamentals of EIA MoE Decree 52/1 of 1996: National environmental quality standards. The Urban Planning decree-law of 1983: ▪ Article 4 to 17: plans, regulations and relevant planning conditions and possibilities. ▪ Article 18 to 24: operational arrangements that governments can use when undertaking a development project. ▪ Article 25 to 44: building permits and land subdivision. Municipal Law decree 118/77: ▪ Article 49: an urban plan should be approved jointly by the Directorate General of Urbanism (DGU) and the concerned municipality.</p>	<p>Ministry of Environment Ministry of Energy and Water Ministry of Agriculture Directorate General of Urbanism (DGU) Ministry of Interior and Municipalities</p>
<p>1.1.3. Augmentation structure developed to reverse water exploitation and saltwater intrusion in coastal areas.</p>	<p>AF Principle: 1, 2, 3, 6, 8, 9, 10, 12, 13, 14, 15.</p>	<p>Environment Law 444 (dated 29/07/2002) Principle 5 Prevention of natural resources degradation; Law no 221/2000 on 26/5/2000 Rectified by law no 241/2000 on 7/8/2000 Amended by law no 377 on 14/12/2001 ▪ Article 1: The protection and development of the water natural resource, within the framework of the preservation of the environment and the balances of nature, are considered as the essence of public benefit; Law No. 64 of 1988 on the protection of the environment against pollution from hazardous waste disposal and substances. Decree 8471/2012: Environmental compliance of establishments; Decree 8633/2012: Fundamentals of EIA; MoE Decree 52/1 of 1996: National environmental quality standards; The Urban Planning decree-law of 1983: ▪ Article 4 to 17: plans, regulations and relevant planning conditions and possibilities. ▪ Article 18 to 24: operational arrangements that governments can use when undertaking a development project. ▪ Article 25 to 44: building permits and land subdivision. Municipal Law decree 118/77: ▪ Article 49: an urban plan should be approved jointly by the Directorate General of Urbanism (DGU) and the concerned municipality.</p>	<p>Ministry of Environment Directorate General of Urbanism (DGU) Ministry of Interior and Municipalities</p>

<p>1.2.1. Monitoring system linked to: (a) Regional Prototype Monitoring System, (b) Weather stations and (c) Early warning mobile application is deployed in pilot farms to control and prevent water exploitation and enhance evidence-based decision-making on water resource management.</p>	<p>AF Principle: 1, 9, 10, 11, 14.</p>	<p>Law no 221/2000 on 26/5/2000 Rectified by law no 241/2000 on 7/8/2000</p> <p>Amended by law no 377 on 14/12/2001</p> <ul style="list-style-type: none"> ▪ Article 1: The protection and development of the water natural resource, within the framework of the preservation of the environment and the balances of nature, are considered as the essence of public benefit; ▪ Article 2 The Ministry of Energy and Water Resources. <p>The Ministry of Energy and Water Resources in the water sector is entitled to the following prerogatives and missions:</p> <ol style="list-style-type: none"> 1. Monitoring, controlling, measuring, computing and studying water resources, as well as estimating the needs for water and its areas of usage across the regions. 2. Controlling the quality and determining the standards of surface, ground and underground water. 	<p>Ministry of Energy and Water</p>
<p>1.2.2. E-platform developed to provide access to crowd-sensed water monitoring data</p>	<p>AF Principle: 1, 2, 4, 5.</p>	<p>Law no 221/2000 on 26/5/2000 Rectified by law no 241/2000 on 7/8/2000 Amended by law no 377 on 14/12/2001</p> <ul style="list-style-type: none"> ▪ Article 2 The Ministry of Energy and Water Resources in the water sector is entitled to the following prerogatives and missions: <ol style="list-style-type: none"> 1. Monitoring, controlling, measuring, computing and studying water resources, as well as estimating the needs for water and its areas of usage across the regions. 2. Controlling the quality and determining the standards of surface, ground and underground water. 8. Conducting studies, water, geological and hydraulic researches and collecting technical data in the field of water, as well as drafting and continuously updating water technical maps. 14. Creating links with the citizens and informing them of all matters of concern with regards to water and the rationalization of its use. 	<p>Ministry of Energy and Water</p>
<p>1.2.3. Capacity-building programme on the use and operation of the monitoring system provided.</p>	<p>AF Principle: 1, 2, 3, 4, 5, 6.</p>	<p>Law no 221/2000 on 26/5/2000 Rectified by law no 241/2000 on 7/8/2000 Amended by law no 377 on 14/12/2001</p> <ul style="list-style-type: none"> ▪ Article 2 The Ministry of Energy and Water Resources. <p>The Ministry of Energy and Water Resources in the water sector is entitled to the following prerogatives and missions:</p> <ol style="list-style-type: none"> 1. Monitoring, controlling, measuring, computing and studying water resources, as well as estimating the needs for water and its areas of usage across the regions. 2. Controlling the quality and determining the standards of surface, ground and underground water. 8. Conducting studies, water, geological and hydraulic researches and collecting technical data in the field of water, as well as drafting and continuously updating water technical maps 	<p>Ministry of Energy and Water</p>
<p>2.1.1. Climate adaptation NBATs mapped and assessed with participatory approach set in place.</p>	<p>AF Principle: 1, 2, 3, 4, 5, 9, 10, 11, 12, 13, 14, 15.</p>	<p>Law no 221/2000 on 26/5/2000 Rectified by law no 241/2000 on 7/8/2000 Amended by law no 377 on 14/12/2001</p> <ul style="list-style-type: none"> ▪ Article 1: The protection and development of the water natural resource, within the framework of the preservation of the environment and the balances of nature, are considered as the essence of public benefit. ▪ Article 2 The Ministry of Energy and Water Resources. <p>The Ministry of Energy and Water Resources in the water sector is entitled to the following prerogatives and missions:</p> <ol style="list-style-type: none"> 1. Monitoring, controlling, measuring, computing and studying water resources, as well as estimating the needs for water and its areas of usage across the regions. 2. Controlling the quality and determining the standards of surface, ground and underground water. 8. Conducting studies, water, geological and hydraulic researches and collecting technical data in the field of water, as well as drafting and continuously updating water technical maps. 	<p>Ministry of Energy and Water</p>
<p>2.1.2. Guides for policymakers, practitioners, and local farming</p>	<p>AF Principle:</p>	<p>Environment Law 444 (dated 29/07/2002) Principle 7.</p>	<p>Ministry of Environment</p>

communities prepared to enhance climate adaptation and mainstream NBATs into planning processes with an explicit focus on the water sector.	1, 2, 3, 4, 5.	Cooperation between central government, local authorities, and citizens; Law no 221/2000 on 26/5/2000 Rectified by law no 241/2000 on 7/8/2000 Amended by law no 377 on 14/12/2001 ▪ Article 1: The protection and development of the water natural resource, within the framework of the preservation of the environment and the balances of nature, are considered as the essence of public benefit. Decree no 118/77 and the municipal laws authorize municipalities to play a leading role in the local planning processes	Ministry of Energy and Water
2.2.1. Local communities and professionals of competent authorities trained on policy-support tool and on-site demonstrations	AF Principle: 1, 2, 3, 5, 6.	Environment Law 444 (dated 29/07/2002) Principle 7. Cooperation between central government, local authorities, and citizens.	Ministry of Environment
3.1.1. Sub-national vulnerability and risk assessment situation analyzed and updated and scaled up.	AF Principle: 1, 4, 5.	Law no 221/2000 on 26/5/2000 Rectified by law no 241/2000 on 7/8/2000 Amended by law no 377 on 14/12/2001 ▪ Article 1: The protection and development of the water natural resource, within the framework of the preservation of the environment and the balances of nature, are considered as the essence of public benefit.	Ministry of Energy and Water
3.1.2. Climate-proofing financing strategy developed to support NBATs in water sector with a specific focus in North Lebanon.	AF Principle: 1, 2, 3, 5.	Law no 221/2000 on 26/5/2000 Rectified by law no 241/2000 on 7/8/2000 Amended by law no 377 on 14/12/2001 ▪ Article 1: The protection and development of the water natural resource, within the framework of the preservation of the environment and the balances of nature, are considered as the essence of public benefit.	Ministry of Energy and Water

ANNEX 4: RISK IDENTIFICATION AND FURTHER ASSESSMENT

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
Compliance with the Law		Low risk. The proposed project abides by relevant national guidelines and regulations such as (a) Environment Law 444, (b) Law no 221/2000 on 26/5/2000 (The law on the Organization of the Water Sector), (c) Decree 8471/2012: Environmental compliance of establishment, MoE Decree 52/1 of 1996: National environmental quality standards. Component 1 interventions remain to be checked against EIA Law in Lebanon, however initial screening indicated that EIA is not required due to the small size of the interventions. The roll out of the NBAT will need to be further checked against international standards.
Access and Equity		Low risk. The proposed AF project will ensure that there will be neither discrimination nor favoritism in the decision-making process, accessing to project products for men and women, vulnerable and marginalized groups. Any conflict that may arise will be addressed and resolved promptly on a legislative basis.
Marginalized and Vulnerable Groups		<p>Low Risk - Vulnerable women, refugees, people with disabilities, older people and people living with HIV / AIDS will be consulted to ensure that the threats they identify are challenges and priorities are reflected. The project will provide vulnerable groups with opportunity to make decisions on specific adaptation measures based on their traditional and local knowledge.</p> <p>The project will create specific space for women, seniors and youth to participate transparently in the development process of the adaptation activities</p>
Human Rights		<p>Low risk</p> <p>This project affirms the rights of all people and does not violate any pillar of human rights.</p>
Gender Equity and Women's Empowerment		<p>The full consultative process will be carried out with the participation of gender experts to ensure that the proposed AF project is responsive to various gender needs and roles such that project activities effectively respond to the unique needs of women and men and promote equal opportunities to participate, and receive comparable social, health and economic benefits.</p> <p>Project activities will be specifically designed to be gender-sensitive. The project will promote and empower women leadership in public spaces and decision-making.</p>
Core Labour Rights		The project will ensure respect for international and national labour laws as prescribed by the International Labour Organization.
Indigenous Peoples	X	<p>No risk</p> <p>The project will not focus on the cultural issues of indigenous peoples.</p> <p>The consultative process for this proposal will involve all socio-economic groups, including vulnerable groups, at the project area inter alia, farmers in the coastal zone, women, refugees, elders and youth of various communities. Their needs and interests in clean water supply will be taken into account.</p>

<i>Involuntary Resettlement</i>		<p>Low to moderate risk.</p> <p>The proposed AF project by design does not carry any risk for involuntary resettlement. A minimal risk may occur in case of lawful expropriation or temporary or permanent restrictions on land use while implementing Nature-Based Adaptation Technologies (NBATs) for enhanced and sustainable management of water resources (Output 1.1.1, Output 1.1.1.2, Output 1.1.3).</p>
<i>Protection of Natural Habitats</i>		<p>Low risk</p> <p>By implementing ecosystem-based adaptation activities such as climate change adaptation and water conservation efforts, the project will actually ensure the protection of natural habitats.</p>
<i>Conservation of Biological Diversity</i>		<p>Low risk</p> <p>Phytoremediation could lead to a deterioration of biological diversity if plant species are not correctly selected. To eliminate this risk, this proposed AF project will prioritize local species and avoid the use of non-native and invasive species. Additionally, these activities will be designed in close collaboration with agro-specialists.</p> <p>By working with local leaders and village chiefs to rescue traditional and native plants and crop species, this project will support the conservation of biological diversity and increase ecosystem resilience.</p> <p>Activities under component 1 will be screened again. Should any activity increase the risk, a full environment and social impact assessment may be necessary at that stage.</p>
<i>Climate Change</i>		<p>Low risk</p> <p>The proposed project activities will not generate nor emit any significant greenhouse gases and will not exacerbate climate change by any means. On the contrary, project activities (Output 1.1.2, Output 1.1.3, Output 2.1.2) will help to mitigate the impacts of climate change in the selected areas.</p>
<i>Pollution Prevention and Resource Efficiency</i>		<p>Low risk</p> <p>The proposed AF project will not release pollutants. Energy efficiency, minimization of material resource use, and minimization of the production of wastes will be embedded in project design. Activities under Component 1 (Output 1.1.2) will be screened again upon exact identification taking into consideration their specific location. Should any activity be deemed to increase the risk, a full environment and social impact assessment may be necessary.</p>
<i>Public Health</i>		<p>Low risk</p> <p>The project will be designed and implemented in a way that avoids any negative impact on public health. Particular attention will be given to water quality and water supply in the vulnerable to droughts coastal zones of Akkar and El-Minieh. The project will ensure that the targeted populations will not face restrictions on their access to public healthcare.</p> <p>Activities under component 1 Creation activities (Output 1.2.) will be screened again. Should any activity increase the risk, a full environment and social impact assessment may be necessary at that stage. will be performed.</p>
<i>Physical and Cultural Heritage</i>		<p>Low risk</p> <p>Local knowledge will be updated within the framework of the proposed AF project. Scientific information will be collected for better water management and climate change adaptation.</p>

		<p>Guides for policymakers, practitioners, and local farming communities will be prepared (Output 2.1.2). Local communities and professionals of competent authorities trained (2.2.1).</p> <p>Consultations and engagement with stakeholders and local representatives will ensure that any physical cultural heritage present on the project site is identified and potential negative impacts are avoided through project design.</p> <p>Should any activity be expected lead to the risk, a full environment and social impact assessment will be performed.</p>
<p><i>Lands and Soil Conservation</i></p>		<p>Low risk</p> <p>Through the adaptation activities proposed, this project will aim to avoid the salinization of land and restore degraded soils through natural regeneration, planting of native plants and complex monitoring of water resources. The project will identify mitigation and monitoring measures to ensure that unintended negative impacts resulting from its activities are avoided or minimized.</p> <p>Should any activity be expected to increase the risk, a full environment and social impact assessment will be performed.</p>

ANNEX 5: LIST OF PARTICIPANTS IN PROJECT CONSULTATION WORKSHOP

Adaptation Fund Potential Project/Lebanon - Consultations Virtual Meeting on Thursday 17/12/2020								
#	Name	Gender	Institution	Position	Phone Number	Email	Status	Signature
1	Rizk Rizk	M	BWE	CEO	3880315	ceo@bwe.gov.lb	Attended	
2	Roy Yazbek	M	BWE	Administrative Expert funded by World Bank	3184705	royy01@yahoo.com	Attended	
3	Eng. Habib Chebib	M	BWE	Senior Mechanical Engineer	71653539	eng.strat@bwe.gov.lb	Attended	
4	Dr. Ihab Jomaa	M	LARI	Head of Dept of Irrigation and Agrometeorology	70099741	ijomaa@lari.gov.lb	Attended	
5	Eng. Antoine Khairallah	M	EBML	Civil Engineer	3662479	khairallah.a@gmail.com	Attended	
6	Samar Hijazi	F	MoWE	Acting Head of Water Monitoring Dep.	01565100/1/2/3/4	samar.r.hijazi@gmail.com	Attended	
7	Mona Fakh	F	MoWE	Director of Water in the Hydraulic and Electrical Resources Dep.	3763936	monafakh@hotmail.com	Attended	
8	Eng. Gaby Nasr	M	NLWE	Technical and Investment Director	3749324	nasrgaby@hotmail.com	Attended	
9	Eng. Rula Bissar	F	NLWE	Engineer	3445698	rula.bissar@gmail.com	Attended	
10	Simon Barakat	M	NLWE	Head of WE Stations (Engineer)	3803906	simonbarakat@hotmail.com	Attended	
11	Rany Haj Youssef	M	NLWE	Head of Minieh Department	3165522	rahayou@hotmail.com	Attended	
12	Razan Dbaibo	F	AUB	Research Assistant	3964164	rd42@aub.edu.lb	Attended	
13	Dr. Isam Bashour	M	AUB	Professor	3247820	ibashour@gmail.com	Attended	
14	Dr. Mario Mhawej	M	CNRS	Researcher	3048956	mario.mhawej@gmail.com	Attended	
15	Dr. Ali Fadel	M	CNRS	Researcher	70703915	afadel@cnrs.edu.lb	Attended	
16	Dr. Ghaleb Faour	M	CNRS	Director of the Remote Sensing Center	3823423	gfaour@cnrs.edu.lb	Attended	
17	Samar Malek	F	MoE	Adaptation Fund Focal Point	3302777	S.Malek@moe.gov.lb	Attended	
18	Lea Kai	F	MoE	Climate Change Project Manager	3744252	l.kai@moe.gov.lb	Attended	
19	Adel Yaacoub	M	MoE	Protection of Natural Resources Dep. Head	3370002	a.yaacoub@moe.gov.lb	Attended	
20	Paul Moussa	M	MoE	Protection of Natural Resources Dep. Head	3531424	p.moussa@moe.gov.lb	Attended	
21	Dr. Maher Tamim	M	Governor of the North	Senior Advisor for Development and NGO Affairs	3787983	maherta@hotmail.com	Attended	

WELCOME NOTE APPROVAL OF MINISTER

22	Eng. Nour Osman	F	Mhamara Municipality	Engineer	70463216	noon-osman-25@hotmail.com	Attended	
23	Youssef Bshara	M	Municipality of Markabta	VP	3299215		Attended	
24	Doha Jammoul	F	LRA	Water Quality Specialist	70946294	doha.jammoul@outlook.com	Attended	
25	Dr. Manal Nader	M	Balamand	Environment Unit	3737128	manal.nader@balamand.edu.lb	Attended	
26	Shady Intari	M	Balamand	Environment Unit	3196 439	shadi.elindary@balamand.edu.lb	Attended	
27	Eva Pek	F	FAO	Water Management Specialist	393208662644	Eva.Pek@fao.org	Attended	
28	Maher Salman	M	FAO	Senior Lead & Water Officer Water Resources Management/Irrigation Team	390657054718	Maher.Salman@fao.org	Attended	
29	Camilla Simoncini	F	FAO	Water management intern		Camilla.Simoncini@fao.org	Attended	
30	Solange MattaSaade	F	FAO	Assistant FAOR (Program)	70246170	Solange.MattaSaade@fao.org	Attended	
31	Dr. Maurice Saade	M	FAO	FAO representative in Lebanon	3382675	Maurice.Saade@fao.org	Attended	
32	Nour el Korek	F	FAO	National Irrigation Water Expert	71253419	Nour.ElKorek@fao.org	Attended	
33	Stamatios Christopoulos	M	FAO	AF Project Design Expert		Stamatios.Christopoulos@fao.org	Attended	
34	Youssef Bizri	M	FAO	Project Manager	70211583	Youssef.Bizri@fao.org	Attended	
35	Yasmina Zraika	F	FAO	Operations Assistant	3288169	yasmina.zraika@fao.org	Attended	
36	Beal Harb	M	FAO	IT Assistant	3679032	Beal.Harb@fao.org	Attended	

37 Gaby Nasr M NLWE Technical/Investment director